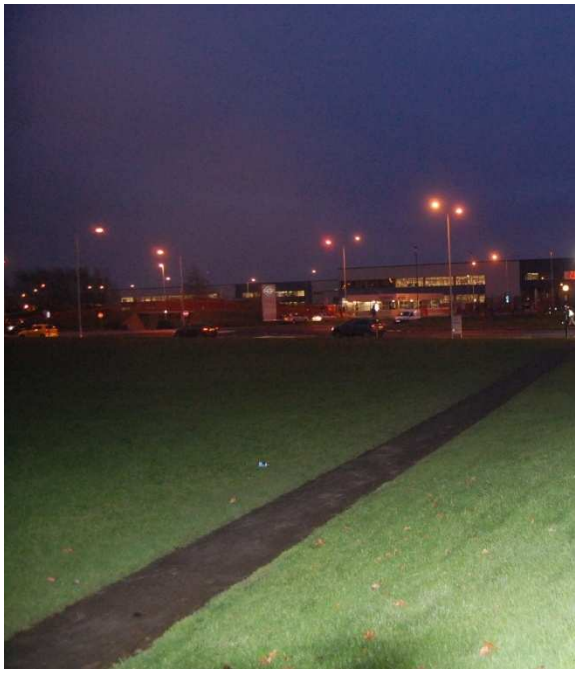
ACCESS ROAD TO A1290, NISSAN WORKS, WASHINGTON ROAD, USWORTH, TYNE AND WEAR



PRELIMINARY EVALUATION REPORT

CP. NO: 1016/09

16/12/2009

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Quality Assurance

This report covers works as outlined in the brief for the above-named project as issued by the relevant authority, and as outlined in the agreed programme of works. Any deviation to the programme of works has been agreed by all parties. The works have been carried out according to the guidelines set out in the Institute for Archaeologists (IfA) Standards, Policy Statements and Codes of Conduct. The report has been prepared in keeping with the guidance set out by North Pennines Archaeology Ltd on the preparation of reports.

REVISION SCHEDULE			
	01	**02**	**03**
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SUMMARY

In December 2009, North Pennines Archaeology Limited undertook an archaeological evaluation on land off the A1290 by the Nissan Works at Washington, Sunderland, Tyne and Wear (NGR: NZ 340 588). This was at the request of MDA Developments Ltd, and was in advance of the submission of a planning application for a sustainable manufacturing centre by Gateshead College (Planning Application 09/02486/FUL).

The town of Washington is situated approximately 9km to the west of Sunderland, on the north side of the River Wear. The Nissan factory is located between Sunderland and Washington, on the west side of the A19 and to the north of the A1231, and the development site is directly north of the factory. The development site lies within an area formerly occupied by an airfield constructed in 1916. Hylton or West Moor Airfield was a Flight Station for 'B' Flight of 36 Squadron. In 1917, the airfield was renamed 'Usworth' and was used by 'A' Flight. Previous archaeological research into the site revealed that there were still buildings associated with this early airfield in 1934, with further buildings present throughout the Second World War and into the 1950s. In accordance with PPG16 and UDP Policy B14 a programme of archaeological evaluation was required to ascertain if any trace of these buildings survive.

The field evaluation consisted of four trial trenches, located to target specific remains of buildings from the First World War airfield: the Main Stores, Motor Transport Sheds and Office and the Workshops.

The trenching revealed a relatively uniform stratigraphy, with natural clay underlying all trenches at an average height of 32.83mOD. All trenches contained a modern 20th century deposit overlying the natural substrate, the top of which averaged a datum height of 33.14m. This deposit indicates the level taken during the clearance of the site with any remains of the airfield buildings removed to this depth or below. This deposit also represents the depth of overburden stripped to during the building of the Nissan Works, when the development site was used as a storage and work area: this is demonstrated by the modern crushed hardcore observed in both Trenches C and D. Trench C also showed the use of hardcore to create the landscaped bunds in the northern extent of the site, indicating that the bunds are simply landscape features rather than the remains of earlier airfield buildings.

In Trench A, a concrete drain was uncovered in the northeast corner of the trench set within the modern backfill. While this could be a remnant of the drainage system from the airfield, it is more likely to be part of a drainage system set up while the area was used as a working compound for the construction of the Nissan Works. Trench B revealed a highly truncated concrete wall footing, which bears no relation to the potential remains of the Main Stores which the trench was targeting. However, the alignment does match with the edge of the road to the east of the building, perhaps indicating that the lowest remains of the road edging still remain *in-situ*.

Overall, the trenching revealed that no remnants of the buildings targeted remain in the evaluation area, with concrete footing remains minimal at best, with the majority removed during the 1980s when the area was used as a compound during the construction of the Nissan Works to the south.

The North-East Regional Research Framework 'Shared Visions' notes that there are relatively few World War I remains in the north-east.. The Research Agenda and Strategy in this publication notes that 'remains relating to the First World War must be recorded, and that full recording is necessary of all 20th century military and defence remains where they are affected by development work'. While it is clear from the previous deskbased assessment that the development area was in use during the First and Second World Wars, the remains of the buildings from that period have been destroyed and removed during the 1980s.

ACKNOWLEDGEMENTS

North Pennines Archaeology Ltd would like to thank MDA Development Ltd for commissioning the project.

NPA Ltd would also like to thank Jennifer Morrison, Archaeology Officer for Newcastle City Council, for all her help and assistance throughout the project.

The archaeological evaluation was undertaken by Tony Liddell and Michael McElligott, with the help of machine-driver John Thralkeld. The trenches were surveyed by Matthew Town and Helen Noakes. The report was written and the drawings produced by Tony Liddell. The project was managed by Frank Giecco, Technical Director for NPA Ltd. The report was edited by Martin Railton, Project Manager for NPA Ltd.

1 INTRODUCTION

1.1 CIRCUMSTANCES OF THE PROJECT

1.1.1 In December 2009, North Pennines Archaeology Limited undertook an archaeological evaluation on land off the A1290 by the Nissan Works at Washington, Sunderland, Tyne and Wear College ([NGR: NZ 340 588]; Figure 1). This was at the request of MDA Developments Ltd, and was in advance of the submission of a planning application for a sustainable manufacturing centre by Gateshead.

1.1.2 The town of Washington is situated approximately 9km to the west of Sunderland, on the north side of the River Wear. The Nissan factory is located between Sunderland and Washington, on the west side of the A19 and to the north of the A1231, and the development site is directly north of the factory.

1.1.3 The development site lies within an area formerly occupied by an airfield constructed in 1916. Hylton or West Moor Airfield was a Flight Station for 'B' Flight of 36 Squadron. In 1917, the airfield was renamed 'Usworth' and was used by 'A' Flight. Previous archaeological research into the site revealed that there were still buildings associated with this early airfield in 1934, with further buildings present throughout the Second World War and into the 1950s (Wooler 2009). In accordance with PPG16 and UDP Policy B14 a programme of archaeological evaluation was required to ascertain if any trace of these buildings survive.

1.1.4 This report sets out the results of the work in the form of a short document outlining the findings, followed by a statement of the archaeological potential of the area, an assessment of the impact of the proposed development, and recommendations for further work.

2 METHODOLOGY

2.1 ARCHAEOLOGICAL BRIEF

2.1.1 A *Specification for Preliminary Archaeological Evaluation at Land off access road to A1290, Nissan, Washington Road, Usworth* (Morrison 2009) was produced by Newcastle City Council and a subsequent trench location plan submitted by North Pennines Archaeology Limited on behalf of the client, MDA Developments Limited, for an archaeological evaluation of the development area. The specification and trench location was agreed upon in consultation with the Archaeology Officer for Newcastle City Council.

2.1.2 Following acceptance of the trench location plan by Newcastle City Council, North Pennines Archaeology Ltd was commissioned by MDA Developments Ltd to undertake the work. The specification and trench location plan was adhered to in full, and the work was consistent with the relevant standards and procedures of the Institute for Archaeologists (IfA), and generally accepted best practice.

2.2 ARCHAEOLOGICAL EVALUATION

2.2.1 The field evaluation consisted of four trial trenches, with Trench A measuring 10.0m in length by 1.60m in width, and Trenches B-D 5.0m in length by 3.0m in width. The trenches were located to target specific remains of buildings from the Second World War airfield: the Main Stores, Motor Transport Sheds and Office and the Workshops.

2.2.2 The location and size of the trial trenches were agreed by consultation between North Pennines Archaeology Ltd and Jennifer Morrison, Archaeology Officer for Newcastle City Council.

2.2.3 The aims of the evaluation can be summarised as follows:

- to establish the presence/absence, nature, extent and state of preservation of archaeological remains and to record these where they are observed;
- to establish the character of those features in terms of cuts, soil matrices and interfaces;
- to recover artefactual material, especially that useful for dating purposes;
- to recover palaeoenvironmental material where it survives in order to understand site and landscape formation processes.

2.3 METHODOLOGY

2.3.1 The trenches were located using Trimble Zeiss 3601 Total Station survey using coordinates from the trench location plan.

2.3.2 The trenches were excavated by a mechanical excavator equipped with a toothless 1.6m wide ditching bucket, under archaeological supervision, to the top of the natural substrate. Each trench was then manually cleaned and any putative archaeological features investigated and recorded according to the North Pennines Archaeology Ltd standard procedure as set out in the NPA Excavation Manual (Giecco 2003).

2.3.3 A photographic record was made using digital photography, 400 ISO Black and White print and 200 ISO Colour Slide film.

2.3.4 All work was undertaken in accordance with the Institute for Archaeologists Standards and Guidance for Archaeological Field Evaluations (IfA 2008).

2.4 THE ARCHIVE

2.4.1 A full professional archive has been compiled in accordance with the specification, and in line with current UKIC (1990) and English Heritage Guidelines (1991) and according to the Archaeological Archives Forum recommendations (Brown 2007). The archive, including the physical and paper archive and copies of the report, will be sent to Tullie House, Carlisle, and will be made available upon request. The archive can be accessed under the unique project identifier NPA09, GCN-A, CP 1016/09.

2.4.2 North Pennines Archaeology supports the **O**nline **A**cces**S** to the **I**ndex of Archaeological Investigation**S** (**OASIS**) project. This project aims to provide an on-line index and access to the extensive and expanding body of grey literature, created as a result of developer-funded archaeological work. As a result, details of the results of this project will be made available by North Pennines Archaeology, and can be accessed under the unique identification number *northpen3- 69355*.

3 BACKGROUND

3.1 LOCATION AND GEOLOGICAL CONTEXT

3.1.1 The city of Sunderland is located in the north-east of England, approximately 16km to the south-east of Newcastle upon Tyne and c.14km to the north-east of Durham. The town of Washington is situated approximately 9km to the west of Sunderland, on the north side of the River Wear. The Nissan factory is located between Sunderland and Washington, on the west side of the A19 and to the north of the A1231.

3.1.2 The topography of the area in and around Sunderland is determined by the geological structure. The strata found in the area are carboniferous coal measures and deposited Permian limestone overlay by glacial drift and alluvium. This limestone overlay rises in a more or less gentle slope under its blanket of glacial drift from the coast to a western escarpment about 500ft above sea level (Countryside Commission 1998).

3.2 HISTORICAL CONTEXT

3.2.1 *Introduction:* this historical background is compiled from the Desk Based Assessment (Wooler 2009) and is intended only as a summary of historical developments specific to the study area.

3.2.2 The place name Usworth is thought to stem from the Old English "burn by Osa's road".

3.2.3 ***Prehistoric Period (pre c.AD 43)***: no prehistoric activity located close to the proposed development area was noted in material consulted for the Desk Based Assessment. The Archaeological Data Service, however, contains an entry in its online catalogue for a possible prehistoric or Roman rectilinear site within an oval enclosure at grid reference NZ 333 90, to the north-west of Usworth airfield, between the Three Horse Shoes and North Moor Farm.

3.2.4 In the nearby vicinity, evidence for human settlement and activity in the Hylton area comes largely from findspots. In 1885 a dug-out canoe was found in the bed of the River Wear at Hylton. A second similar canoe was already known to Sunderland Museum as they had in their collection a photograph showing a fragmentary example. This canoe was believed to have been dredged from the River Wear between Hylton Dene and Southwick. The two canoes are suggested to have dated to the late Bronze Age or the Iron Age. Other prehistoric finds within the locality of Hylton include a bronze socketed axe from the Wear and two late Bronze Age swords from the Wear at Ford. The axe and two swords (which are of the Park Ewart type) are considered to be c.900-700BC.

3.2.5 In the wider landscape, prehistoric activity is evidenced by Bronze Age burials at Humbleton Hill and Hastings Hill, and Mesolithic and Neolithic flints and arrowheads have been found at Grindon, all on the south side the River Wear. Mesolithic to late Bronze/early Iron Age occupation have been discovered at Bishopwearmouth, also on the south side of the Wear, and prehistoric burials and enclosures are known at Fulwell and Carley Hill on the north side of the river, and to the east of Hylton.

3.2.6 ***Romano-British Period (c.AD 43-400)***: in 1939, a hoard of Roman coins were found at Washington Station. The hoard contained 59 coins including one minted during the reign of Emperor Constantine (possibly 4th century AD). There is no evidence as yet for activity during this period in close proximity to the proposed development area although the cropmarks already referred to may date to this period. It has been mentioned by Mr Fulton at the North East Aircraft Museum, that 'Roman remains' were found during preparatory work for the construction of the Nissan plant on the former airfield. No written confirmation of this has, however, been found during the desk-based assessment.

3.2.7 The main evidence for occupation of the area around Sunderland during this period is in the form of burials and coins. In 1759 a cist containing a large skeleton was uncovered at Fulwell during limestone quarrying. Two coins dating from the beginning of the 3rd century were found close by. To the north, near the Carley Hill quarry, a bronze figurine of Jupiter Dolichenus, a Romano-British god, was discovered in 1820. In 1971 the hill also yielded two Roman coins dating from the 2nd to the 3rd centuries. To the west at Southwick quarry, pieces of Roman pottery, including the remains of a late 4th century cooling pot were found in 1927. Coins from the period have also been found at and around Hylton, as well as a possible Roman milestone inscribed with a dedication to the Emperor Gordian (AD 238-44) found in the Wear and recorded by the prominent antiquarian, Robert Surtees, although its exact find spot is unknown.

3.2.8 ***Early Medieval Period (c.AD 400-1066)***: the only evidence for activity or settlement during this period comes from place names, as already referred to in 3.2.2 above. What is now known as Tyne and Wear was certainly an important area during this period as show by early Christian sites such as Jarrow (HER 1227), Tynemouth (HER 124-9) and Monkwearmouth which was founded by Bishop Bishop in 674AD (HER 87). There is no evidence of activity during this period in close proximity to the proposed development area, although as with earlier periods this does not mean a total absence of settlement or land use.

3.2.9 ***Medieval Period (c.AD 1066-1485)***: there is no evidence of medieval activity in the vicinity of the proposed development area. It is possible that the land may have been on the edges of Hylton Castle estate, and may have been waste, common or agricultural in nature.

3.2.10 Hylton Castle, located to the east of the proposed development area and now surrounded by housing, was built by Sir William Hylton as a gatehouse style fortified manor house. Although no construction records survive, the style of the architecture and coats of arms on the west front mean that it dates to the 1390s or the first decade of the 1400s. Other buildings may have existed on the site at this time, as the inventory taken on Sir William's death in 1435 mentions a hall, four chambers, two barns, a kitchen and the chapel in addition to the castle. Early in the 18th century, Baron John Hylton made the first major alterations. He completely redesigned the interior and inserted large windows in the fashionable Italianate style. His son, John, made even greater alterations. He built a south wing and added crenallations to both wings. When he died in 1746, the Hyltons sold the castle, as there was no male heir to inherit it. Successive owners failed to maintain it, and in 1863 it was bought by William Briggs, who knocked down the north and south wings, gutted the interior and added new windows. The chapel at Hylton Castle, dedicated to St Catherine, is known to have existed on the site since 1157, when it was likely that Hylton Castle was a wooden building. Nothing remains of the first chapel and the ruins seen today date from the early 15th century.

3.2.11 Like the rest of Monkwearmouth parish, Hylton had presumably been part of the lands of the Anglian monastery, but after the Norman Conquest it did not pass with the other townships to the priory's monastic cell. From the 12th century, and perhaps earlier, the manor and township of Hylton belonged to the Hilton family who took their name from the estate. There is evidence that there was a mill at Hylton by the late 12th century, although its precise location if unknown. If it was a watermill if may have stood at Hylton Dene. In later centuries a windmill was sited to the north of the castle.

3.2.12 ***Post-Medieval Period (c.AD 1485-1900)***: writing in 1967, Bennett refers to the 'Blackwood' located beside Usworth Aerodrome, as providing some idea of what the countryside was like in the area before any clearance was undertaken, although the exact location of the 'Blackwood' does not appear to be shown on any historical mapping. He noted that the land between Biddick Forest and the Three Horse Shoes was drained in 1820. Oak was mainly grown in Biddick Forest, and for centuries it was exported from Sunderland port, providing a considerable trade in hardwood as well as coal.

3.2.13 Nearby Hylton Castle was the site of skirmishes during the Civil War in the middle of the 17th century. Corfe noted that these skirmishes took place on high ground to the north of the castle in 1644.

3.2.14 Industries along the Wear appear to have been well established by the early 19th century. Parson and White refer to industry at Southwick (1¼ miles north-west of Sunderland and to the east of Hylton) on the north bank of the river, which included several shipyards, lime-kilns and earthenware and glass manufactories. The trade directory in Parson and White lists the trades in the township of Hylton in 1828, these appear to be more agricultural in nature rather than industrial, apart from Auston Dixon & Co, earthenware manufacturers at Hylton Ferry and Robert Reay, shipbuilder and timber merchant at the same location. Farms such as Cow Stand (occupied by Marmaduke Robinson), West Moor (Thomas Reed) and South Moor (George and James Curry), all previously located within close proximity to the proposed development area, were all in existence at this date. The Three Horse Shoes is listed as occupied by John Merriman, victualler and blacksmith, at 'Road Stone' in Hylton township; this may be an earlier name for the site although it is not shown on later mapping. North Hylton appears to have been more industrial than the rest of the township, no doubt due to its proximity to the river. Brett refers to industries such as iron ore (on land close to the ship building yards); charcoal; lamp black; grindstones and whetstones (North Hylton had quarries that yielded grindstones in the 17th and 18th centuries) which were exported all around the world; sandstone quarried from sites such as Wood House at North Hylton; tar; a pottery had been established at North Hylton in 1762 by the Maling family. The Malings had been Huguenot refugees who settle in Scarborough before moving to Sunderland. Rich clay beds and the riverside location for east of transport on the Wood House estate made it an ideal site for a pottery. The outbreak of the Crimean War in 1854 signaled an upturn in industry in North Hylton. The old pottery building was turned into a forge and iron works and shipbuilding yards sprang up on vacant lots on the riverside.

3.2.15 With reference to Hylton Colliery (or Castletown Colliery), Brett noted that the Wearmouth Coal Company bought the Wear Steel Works, 36 acres of land and 190 workmen's cottage for £37 000. The company began work on sinking the first shaft in March 1897. In October 1900 the mine was still being developed but was still producing 500 tons of coal a day. Output almost doubled when Hylton was at its peak and the workforce topped the 1000 mark. In 1907 the coal company bought the whole of the 2000 acres Hylton Castle Estate including the castle. As they already owned the coal rights the purchase was made as an investment. In the late 1970s Hylton was one of a number of small Durham collieries which ceased mining coal, the

pit finally closed in July 1979. The colliery at Hylton (located approximately 2km to the south-east of the proposed development area) was not the only colliery site in the area; Usworth Colliery is shown on the Ordnance Survey map of 1921 (HER No. 365) and a colliery also existed at Boldon to the north which opened in 1862 and closed in 1982 (HER No. 2567). There does not appear to have been any collieries within close proximity to the proposed development area.

3.2.16 The mining of coal was greatly aided by the railways. The colliery at Usworth (NZ 315 584) was served by sidings alongside what became the North Eastern Railway line from Washington to Pelaw, ½ mile north of Usworth Station. Prior to the first locomotives, trucks on these sidings were almost certainly shunted by horses33. The Pontop and South Shields Branch of the North Eastern Railway was originally the Stanhope and Tyne Railway which opened in 1834 as the first public railway on Tyneside. It carried minerals from County Durham to the Tyne and passengers from South Shields to the Durham Turnpike (HER No. 2290). The Hylton, Southwick and Monkwearmouth Railway was formed in 1871 to develop industry on the north bank of the Tyne. It opened in 1876 between the NER line at Monkwearmouth and the NER's Tyne Dock-Consett line at Southwick Junction, although the latter connection was removed shortly after. Both the Pontop and South Shields Branch of the NER and the Hylton, Southwick and Monkwearmouth branch line are located to the west and the south of the proposed development site respectively. There was no evidence that any railway lines or associated features crossed the proposed development area.

3.2.17 ***Modern (1900-Present)***: the industrial nature of the area around Sunderland, such as shipbuilding and coal mining, meant that the town and its hinterland were obvious German targets during the First World War. In April 1916, for example, a Zeppelin passed over Seaham harbour and crossed over the colliery villages towards Washington. Fourteen explosive bombs and seven incendiary bombs were dropped within five minutes. The first bomb in Sunderland landed in a yard in Peacock Street. The Zeppelin then made its way towards Monkwearmouth goods yard, hitting North Bridge Street, the tramway sheds and the Workmen's Hall (Calvert Street). The greatest amount of damage was done to Fern Street, North Bridge Street and Victor Street.

3.2.18 As a consequence of Zeppelin raids on the area around Sunderland, an airfield was created outside the town in October 1916 as a Station for 'B' Flight of No. 36 Squadron. It was originally known as Hylton, although when it was being prepared it was known as West Town Moor. Due to the increase in German bombing, the Royal Flying Corps undertook the task of Home Defence, setting up a number of squadrons, with flights spread over

the length of the British coastline. The north-east was protected by No. 36 Home Defence Squadron, which was formed by Capt. R O Abercromby at Cramlington in February 1916. No. 36 Home Defence Squadron defended the coast between Whitby and Newcastle. The main base was at Cramlington, to the north of Newcastle, with flights being attached to Seaton Carew and Ashington, as well as Hylton. By August 1918 Hylton was in use by 'A' Flight and continued as such until the Armistice, when it was just beginning to become known as Usworth.

3.2.19 Following the end of the First World War, Usworth airfield reverted to non-flying use, as was the case with many First World War aerodromes. Usworth languished unused for over a decade, apart from at least one visit by Alan Cobham's Flying Circus, until it was re-activated on March 17th 1930. From this period, the flying field was located to the south side of the road between Washington and Sunderland, and ancillary buildings were located to the north. The airfield was designed to accommodate one squadron of the recently expanded Royal Auxiliary Air Force, No. 607 (County of Durham) Squadron. North Camp was provided with living quarters and dining facilities for Officers, NCOs and airmen. It was initially proposed to erect canvas Besoneaux Hangars on the South Camp, however these were rejected in favour of the erection of a large Lamella Hangar. The South Camp also housed the Squadron Office, pilot huts, armoury, photographic hut and bombing training aids. The firing butts were alongside the railway. On 24th 1934, the airfield was opened to the public on Empire Air Day; this attracted 1300 visitors with an estimated 5000 other spectators watching the flying displays form outside the airfield. Proceeds from the Empire Air Day went to the RAF Benevolent Fund. The Empire Air Day in 1937, as well as having flying demonstrations and aerobatics, also included the erection of a dummy fort near the southern perimeter of the airfield, which was the subject of 'attacks' by the Hinds of 103 Squadron with the Demons of No. 607 Squadron 'defending'.

3.2.20 In September 1939 work commenced on the laying of two concrete runways, as well as the expansion of the airfield to the south, east and west by taking in adjoining fields. The new 2800 feet (c.900m) long runway was laid northwest to south-east, with another of similar length on a north-south heading. A new perimeter track was laid out along the airfield boundary with eight dispersal pens, each capable of holding a twin-engined aircraft. There were also 34 hard standings for single-engined fighters. Three of the older Callender Hangers were dismantled, leaving the Lamella and a single Callender hangar opposite the main gate. Additional buildings were constructed between the airfield and the road. An Operations Room was built near the Lamella hangar; this was later supplemented by an

underground Battle Headquarters near the Cow Stand Farm corner of the airfield. On the North Camp side new accommodation blocks were erected for the expected large influx of personnel which included WAAFs. On both sides of the road numerous air raid shelters were constructed. To assist in the defence of the airfield a series of dispersed sites were set up over a wide area around the site; these included a searchlight camp at the top of Ferryboat Lane and small gunposts on the Birtley Road, above the old quarries at the bottom end of Boldon Bank and along the disused railway line towards North Hylton. At Downhill Farm a large gun site was set up, and a decontamination centre was constructed well away from the airfield. During the Second World War, a watch tower was constructed on stilts on the roof of the Three Horse Shoes; the pub also acted as a Mess for Officers during this period.

3.2.21 In the publication *Archaeology of the Twentieth Century Defence Sites of Tyne and Wear: An Illustrated Guide*, several sites in and around the airfield at Usworth are listed. Of particular interest are the Pickett-Hamilton Forts, which were a form of pillbox unique to airfields, and which were often placed down the very centre of the runway. Pickett-Hamilton Forts were sunken, circular reinforced concrete pillboxes which remained flush with the airfields surface to permit the free movement of aircraft. If there was a threat of attack, however, the forts would be raised by a hand operated hydraulic jack and manned with guns.

3.2.22 Sunderland and its surrounding area did not escape bombing during the Second World War. The first bombs dropped on the district fell soon after midnight on the 22nd June 1940. Areas affected included buildings at the Old Rectory at Whitburn, a field near Church Lane and The Bents, and the Fishermen's Cottages, which narrowly escaped being demolished. An incendiary bomb fell onto Hylton Dene, 100 yards from Hylton Colliery, Castletown.

3.2.23 The airfield at Usworth had the distinction of being singled out for a major Luftwaffe attack during the Battle of Britain. On August 15th 1940, German aircraft were detected approaching the east coast of Britain. Spitfires from 72 Squadron Ackington met them off the Farne Islands, and although heavily outnumbered, several German aircraft were destroyed. The German formation then split in two, one portion making for Tyneside, while the other turned south. The Second Acklington Squadron, No. 79, encountered the northern group just off the coast and a wild dog-fight ensued. Reforming, the Hurricanes caught up with the bombers approaching Newcastle, where their primary objective would appear to have been Usworth. Harried by the Tyne guns and by more Hurricanes from Drem in

Scotland, the German 'Heinkels' made off, scattering their bombs with little effect, and leaving Usworth untouched.

3.2.24 For much of the Second World War, Usworth was used for training, with pilots of several nations stationed there, including Polish, Czech, Canadian, Australians, Americans and New Zealanders. The training of new pilots up to operational status was a hazardous activity with many aircraft damaged or destroyed during this period. Many of these pilots have their last resting place in Castletown cemetery near the airfield.

3.2.26 Following the end of the Second World War, Usworth was home to No. 31 Gliding School which had formed around 1944. The role of the Gliding School was to provide elementary flying training to cadets of the Air Training Corps from local squadrons in the north-east. In 1951 control of Usworth passed to No. 2 Basic Air Navigation School which disbanded in 1953 when control passed to Durham University Air Squadron. In 1958 the Gliding School, the University Air Squadron and the G.C.I aircraft were moved to RAF Ouston as Usworth was to close, although some limited use of the site was made by the Territorial Army for parachute training from tethered balloons. On 3rd July 1962, Usworth was bought by Sunderland Corporation for £27, 000 and reopened as Sunderland Airport.

3.2.27 Sunderland Corporation re-laid the runways and renovated the hangar, and in June 1963 Sunderland Flying Club came into being. On June 28th 1964 an Open Day and commemorative ceremony took place to celebrate the rebirth of what became Sunderland Airport. The Air Day in 1964 became an annual event with subsequent shows attracting greater participation. Sunderland Air Day in June 1981 attracted an estimated 50, 000 people to the airfield and surrounding hills. In the 1980s, 700 people a year made their first parachute jump at Sunderland Airport.

3.2.28 During the 1970s and 1980s, the collapse of manufacturing in the Sunderland area had a detrimental effect on employment. For example, over 34 000 jobs were lost between 1971 and 1981 alone. In the 1980s the economic outlook was bleak, although Sunderland enjoyed Development Area status and was eligible for maximum Urban Aid and EEC grants. The co-ordinated efforts of Sunderland Borough, Tyne and Wear Council, Washington Development Corporation and the government scored a major success in 1984 when they succeeded in attracting Nissan to build its new UK factory on Wearside. The massive Nissan plant was constructed on the 297 acre site of Sunderland (Usworth) Airport.

3.3 PREVIOUS WORK

3.3.1 In 2005, Archaeological Services University of Durham (ASUD) undertook an archaeological desk-based assessment and archaeological monitoring at Nissan Wind Farm (NZ 339 579, to the south of the Nissan factory). The desk-based assessment noted that although there was no direct evidence for prehistoric or Roman activity in the development area the presence of activity in the surrounding vicinity indicated that an as yet unidentified resource has the potential to exist. It was also noted that the use of the site as an airfield in the First and Second World Wars suggested that the site may have undergone significant landscaping to provide a level area for aircraft to land and take off.

3.3.2 An archaeological desk-based assessment was undertaken by On Site Archaeology Ltd (OSA) of land at Nissan Factory Business Park (located between the Nissan factory and the A1231 to the south), Washington, in July 2007 . The work concluded that there was the possibility that buried remains were present on the site, which could date from any period between the early Bronze Age and the present day. It was noted that the remains may survive as features cut into the natural subsoil and would possibly be visible immediately below the topsoil and B-horizon. The top of the archaeology was suggested to be located between 0.2m and 0.5m below the present ground surface.

3.3.3 A geophysical survey was undertaken by Met Surveys in April 2008 at Turbine Business Park, on land to the north of the A1231. The survey covered an area of approximately 20 hectares which at the time was rough pasture. The site had been in agricultural use for the past 20 years and although there were no known sites within the area, it was considered that there was the potential for buried archaeological remains to exist. The survey results revealed no features of archaeological significance, although modern services were noted to run across the site as evidence by manholes. The remains of ridge and furrow were detected in some parts of the site indicating the past agricultural use of the land, but their nature (narrow, closely spaced and straight) suggested they were of relatively modern origin.

3.3.4 Following on from the geophysical survey undertaken by Met Surveys, On Site Archaeology (OSA) conducted an archaeological evaluation on the land at Turbine Park in August 2008. Features such as the ridge and furrow and areas of disturbed ground, highlighted by the geophysical results, were targeted with the evaluation trenches. The work concluded that despite sites apparently rural appearance, it was clear that the site had been heavily re-worked during the 20th century. For example, the central, western and

northern parts of the site had been used to dispose unwanted waste material from building, which may have originated from the construction of the airfield, the test track or the nearby road. In all cases the method of dumping was the same; the topsoil was removed, the 'fill' material was dumped and then the topsoil was reinstated. The only feature potentially older than the 20th century was found in Trench 1 and consisted of a shallow linear feature containing small fragments of white-glazed pottery of 19th or 20th century date. Interestingly, the areas of ridge and furrow apparently revealed by the geophysical survey, and tested by Trenches 6, 8, 9 and 10, were not found. In the cases of Trenches 6 and 8 the presence of respectively c.0.70m thick and a 1.5m thick layer of dumped material would have prevented the detection of any preserved ridge and furrow.

3.3.5 In June 2009, North Pennines Archaeology Limited were commissioned by MDA Consulting Ltd to undertake an archaeological desk-based assessment of the current development area prior to the submission of a planning application for a sustainable manufacturing centre by Gateshead College. The desk-based assessment revealed that the proposed development area appears to have been undeveloped until the construction of the airfield at Usworth in 1916. The land appears to have been agricultural in character, despite industrial activity within close proximity (for example, the various railway branch lines, collieries and brick works). The assessment also demonstrated that Usworth Airfield started life in October 1916 as a Flight Station for 'B' Flight of 36 Squadron, and was initially known as Hylton or West Town Moor. By 1917, when it was used by 'A' Flight, it was starting to be known as Usworth. For most of its wartime career Usworth was a training station. Aerial photographs from 1934 show buildings at the airfield were located on the site of the proposed development area, with the main entrance situated in the approximate location of the present footpath. A map of 1945 shows the extent of the buildings on the site at that date; although these were mostly constructed of timber it is likely these structures sat on brick or concrete footings. An aerial photograph dating to 1941/1942 showed two cropmarks located to the west of the proposed development area; it is not known if these relate to the airfield or are totally unrelated, but they may suggest earlier activity in close proximity to the airfield site.

4 EVALUATION RESULTS

4.1 INTRODUCTION

4.1.1 The trenches were excavated down to the natural substrate where possible, followed by further hand excavation of potential archaeological features allowing an examination of any prospective archaeological remains. Trench locations are depicted in Figure 2.

4.1.2 Plans and sections of Trenches A, B and D can be found on Figure 3, and a plan and section of Trench C can be found on Figure 4.

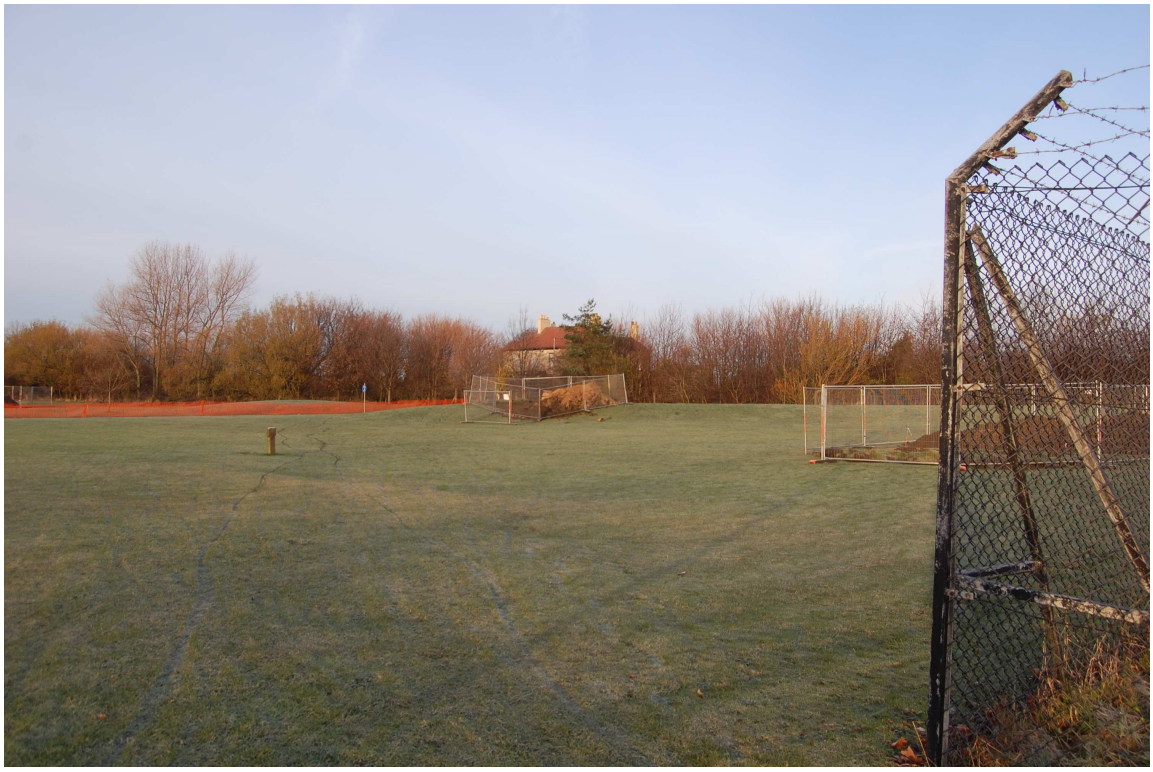

Plate 1. *The site looking northwest.*

4.2 TRENCH A

4.2.1 Trench A measured 10.00m in length and 1.60 in width, and was orientated roughly east-west.

4.2.2 The trench was located to evaluate the potential remains of the western and northern extensions of the Main Stores for the airbase, known to have been of timber construction.

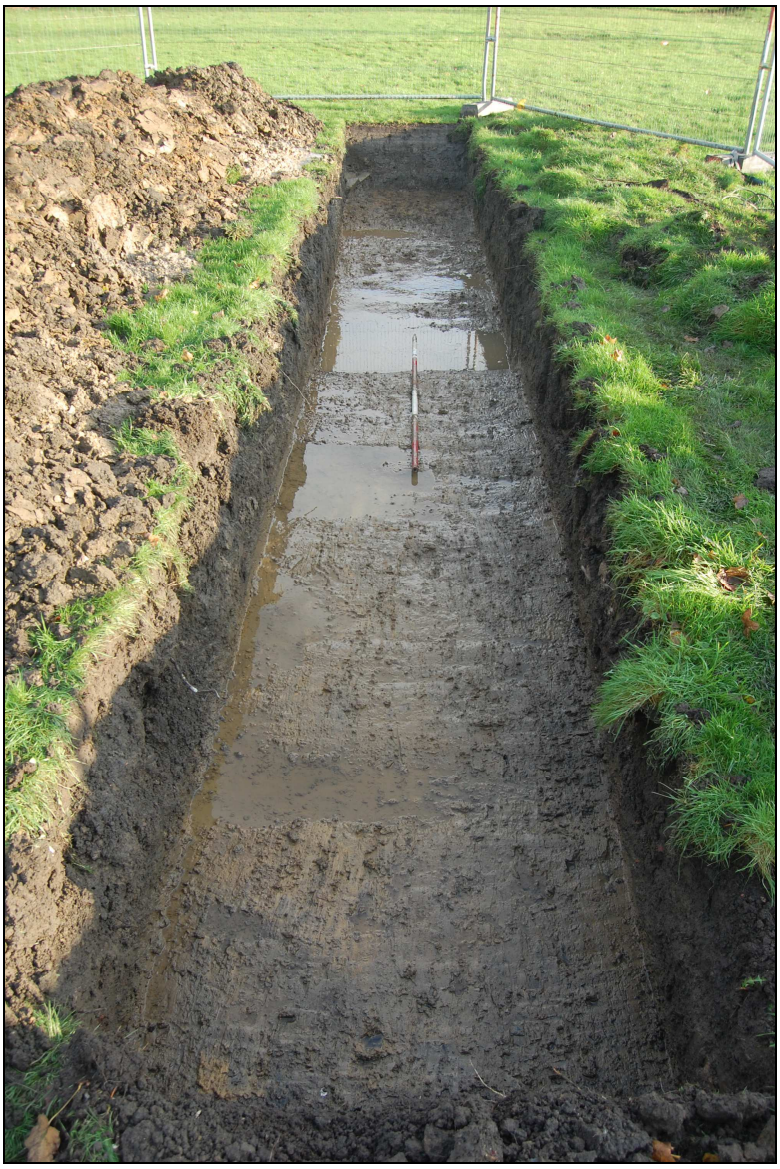

***Plate 2**. Trench A, looking east.*

4.2.3 The natural substrate, context (**102**), was found to be a compact orange/brown sandy clay averaging a depth of 0.68m below the current surface (and at an Ordnance Datum of 32.96m). Above the natural clay was a c.0.35m thick deposit of 20th century backfill, context (**104**), which was a compact mid-grey/brown silty clay with inclusions of small stones, concrete slivers and brick fragments. Above the backfill was a modern subsoil layer, context (**101**), which measured c.0.22m thick and was comprised of loose mid-brown sandy clay. Topsoil and turf, context (**100**), sealed the subsoil with an average depth of 0.14m.

4.2.4 In the north east corner of the trench the edge of a concrete drain, context (**108**), was uncovered aligned northwest-southeast, and sitting within the

modern backfill at 33.12mOD. This suggests that either the drain is not *in-situ*, or that the backfill context was laid at the same time as the drain, possibly as a packing 'foundation' layer for the building.

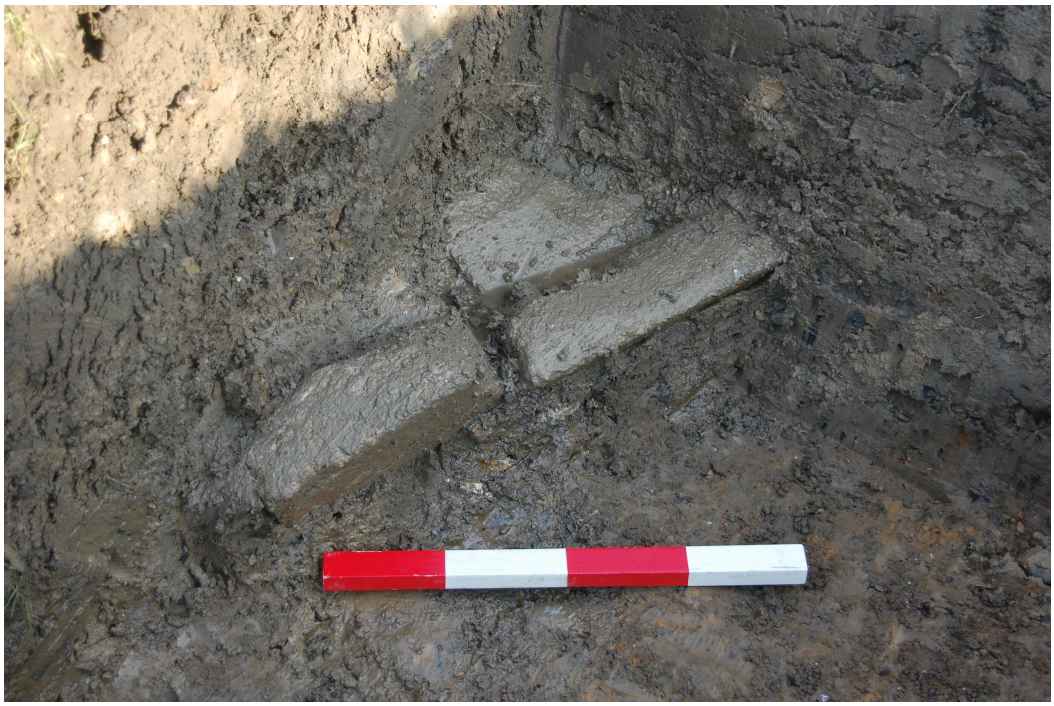

***Plate 3**. Drain (**108**) looking north-east.*

4.2.5 Fragments of late 20th century pottery and glass were recovered from context (**104**), with the other strata remaining artefactually sterile. No deposits were deemed suitable for environmental sampling.

4.3 TRENCH B

4.3.1 Trench B measured 5.0m in length and 3.0m in width, and was orientated roughly east-west .

4.3.2 The trench was located to evaluate the potential remains of the eastern extension of the Main Stores for the airbase, known to have been of timber construction.

4.3.3 The natural substrate, context (**102**), averaged a depth of 0.89m below the current surface (Ordnance Datum of 32.54m). Over the natural clay was a c.0.45m thick deposit of context (**104**), comprising 20th century backfill, above which was the modern subsoil layer, context (**101**), which measured c.0.22m

Topsoil and turf, context (**100**), sealed the subsoil with an average depth of 0.22m.

4.3.4 In the western extent of the trench was the remains of a concrete wall footing (**106**), aligned roughly northwest-southeast (Plate 5). The footing of the wall lay at 32.85m OD, measured 0.47m in width and spanned the width of the trench. The concrete lay on a thin deposit of context (**107**), a black ash and grit deposit which made up the lowest foundation strata of the wall remains.

4.3.5 Fragments of 20th century pottery and glass were recovered from context (**104**), with the other strata remaining sterile of artefacts. No deposits were deemed viable for environmental sampling.

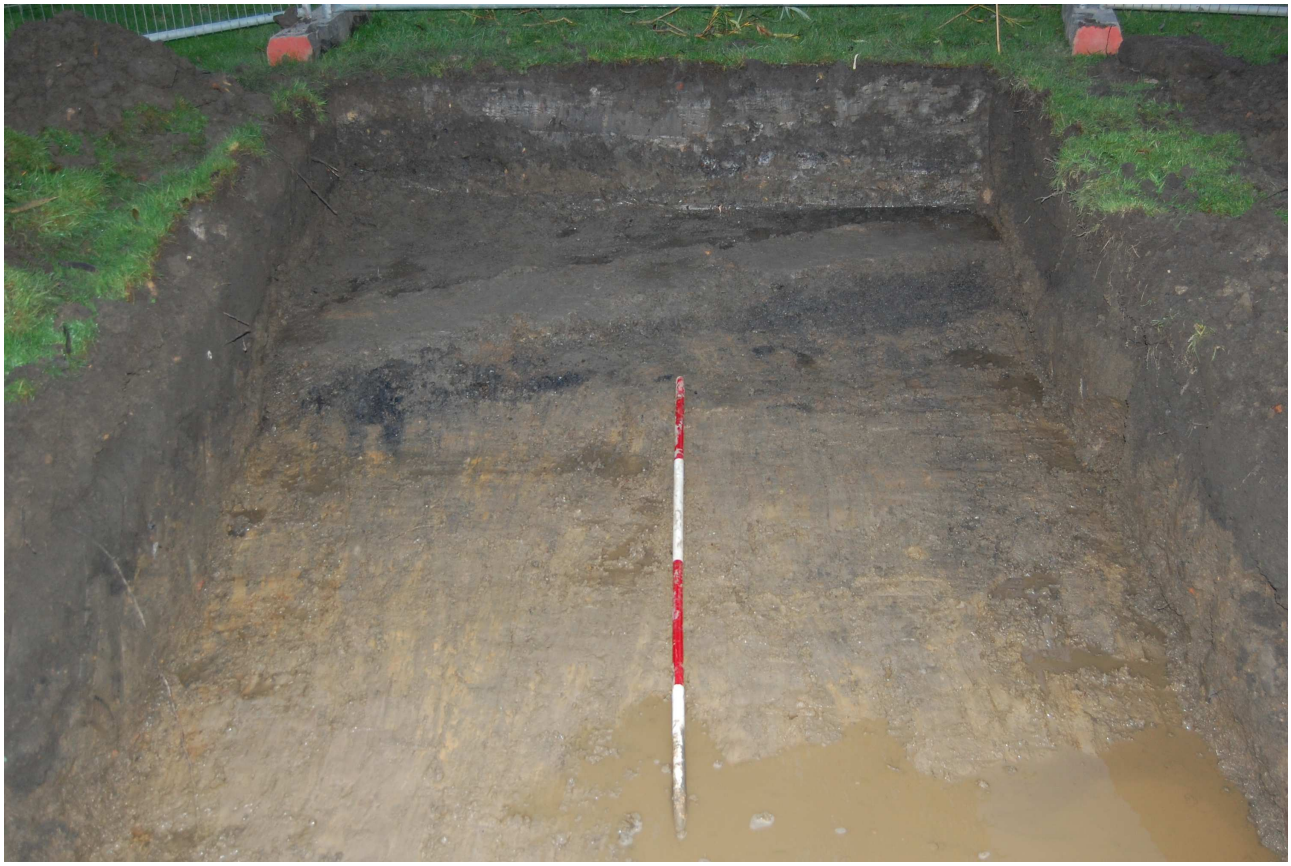

Plate 4. *Trench B, looking west.*

***Plate 5**. Wall footing (106), looking north.*

4.4 TRENCH C

4.4.1 Trench C measured 5.0m in length and 3.0m in width, and was orientated roughly north-south on the crest of a bund bordering the north side of the plot of land to the east of the dividing public path.

4.4.2 The trench was located to evaluate the potential remains of the Motor Transport Sheds and Office for the airbase, known to have been of timber construction.

4.3.3 In this trench, the natural substrate was not revealed due to the trench depth exceeding the reach of the mechanical excavator's bucket due to the trench's position on the bund. The depth excavated reached a vertical 2.02m, with the 20th century backfill layer, context (**104**), revealed 1.70m below the current surface. Over this layer was a 1.06m thick deposit of pale yellow crushed

hardcore, context (**103**), which formed the core of the bund's structure. Above the hardcore was a 0.27m thick deposit of modern subsoil, context (**101**), sealed by a 0.37m deposit of topsoil and turf, context (**100**).

4.3.4 Due to the highly unstable nature of the hardcore, the trench was stepped inwards and the deepest section of the excavation was not entered for recording purposes on Health and Safety grounds.

4.3.5 No artefactual or structural remains were recovered from this trench, and no deposits were deemed suitable for environmental sampling.

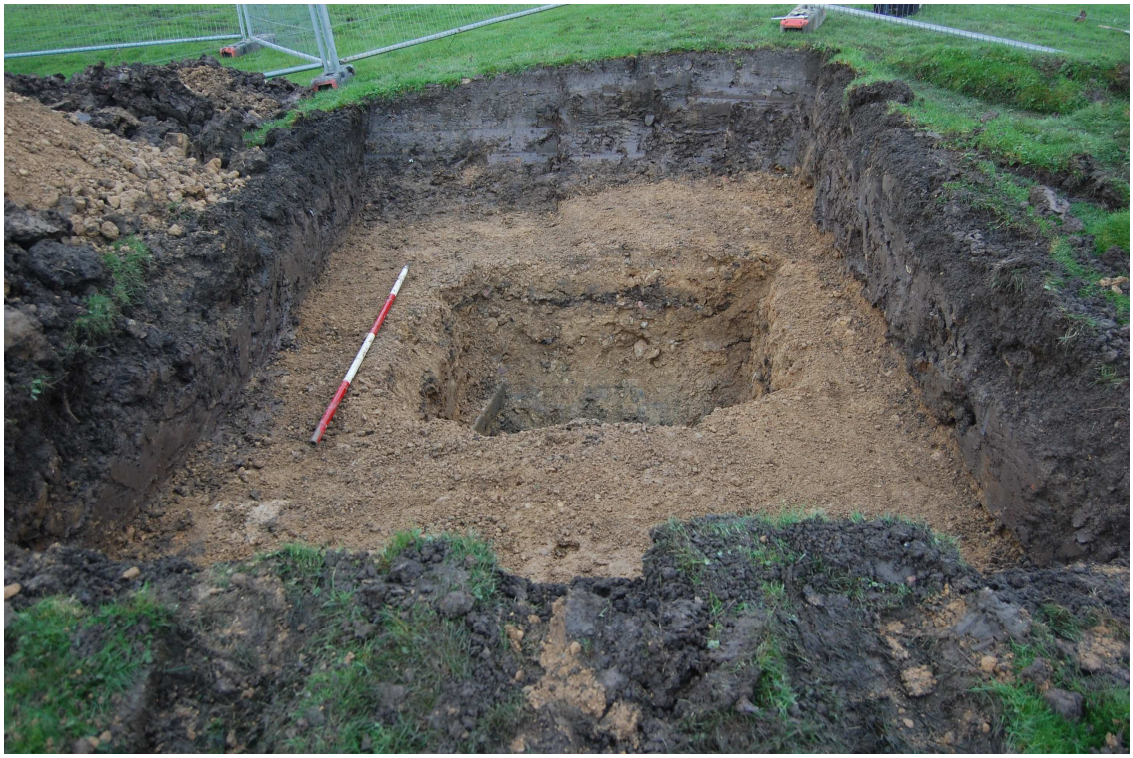

***Plate 6**. Trench C, looking south.*

4.5 TRENCH D

4.5.1 Trench D measured 5.0m in length and 3.0m in width, and was orientated roughly east-west in the eastern extent of the development area.

4.5.2 The trench was located to evaluate the potential remains of the main Workshops for the airbase, known to have been of timber construction.

4.3.3 The natural substrate, context (**102**), was found at a depth of c.0.75m below the current surface (and at an Ordnance Datum of 32.99m). Above the natural clay was a c.0.37m thick deposit of 20th century backfill, context (**104**). Above the backfill was a thin 0.06m thick deposit of pale yellow crushed hardcore, context (**103**), sealed by a c.0.17m thick layer of modern subsoil, context (**101**). As with the previous three trenches, Trench D was

sealed by topsoil and turf, context (**100**), measuring an average thickness of 0.11m.

4.3.4 At the south-western extent of the trench a concrete block, context (**105**), was found embedded in the natural clay. This block measured 0.64m in length, 0.31m in width and had a visible depth of 0.19m. The block was highly degraded, and although it could perhaps have been the remains of a concrete plinth or footing, it is more likely that it is a disturbed block pushed into the natural clay during the leveling of the site.

4.3.5 Fragments of early 20th century pottery were recovered from context (**104**), with the other strata remaining artefactually sterile. No deposits were deemed viable for environmental sampling.

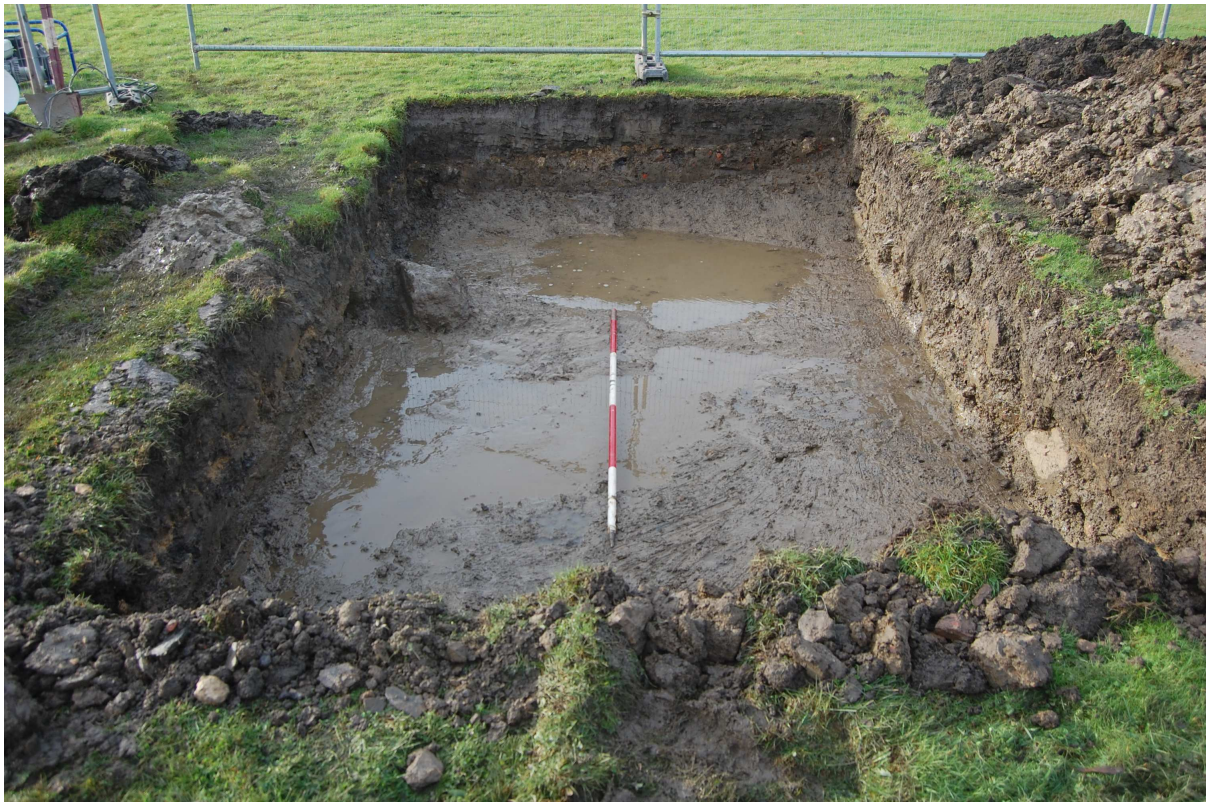

Plate 7. *Trench D, looking west.*

5 CONCLUSIONS AND RECOMMENDATIONS

5.1 CONCLUSIONS

5.1.1 The trenching revealed a relatively uniform stratigraphy, with natural clay underlying all trenches (this is assumed for Trench C) at an average height of 32.83mOD.

5.1.2 All trenches contained a modern 20th century deposit overlying the natural substrate, the top of which averaged a datum height of 33.14mOD. This deposit indicates the level taken during the clearance of the site with any remains of the airfield buildings removed to this depth or below. This deposit also represents the depth of overburden stripped to during the building of the Nissan Works, when the development site was used as a storage and work area: this is demonstrated by the modern crushed hardcore observed in both Trenches C and D. Trench C also showed the use of hardcore to create the landscaped bunds in the northern extent of the site, indicating that the bunds are simply landscape features rather than the remains of airfield buildings.

5.1.3 In Trench A, a concrete drain was uncovered in the northeast corner of the trench set within the modern backfill. While this could be a remnant of the drainage system from the airfield, it is more likely to be part of a drainage system set up while the area was used as a working compound for the construction of the Nissan Works.

5.1.4 Trench B revealed a highly truncated concrete wall footing, which bears no relation to the potential remains of the Main Stores which the trench was targeting. However, the alignment does match with the edge of the road to the east of the building, perhaps indicating that the lowest remains of the road edging still remain *in-situ*.

5.1.5 Overall, the trenching revealed that no timber remains of the buildings targeted remain in the evaluation area, with concrete footing remains minimal at best, with the majority removed during the 1980s when the area was used as a compound during the construction of the Nissan Works to the south.

5.2 RECOMMENDATIONS

5.2.1 The potential for archaeological remains within the development area remains low. Given the lack of any significant archaeological features during the evaluation it is recommended that no further work takes place.

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APPENDIX 1: CONTEXT TABLE

Context	Context Type	Description
(100)	Deposit	Modern topsoil and turf.
(101)	Deposit	Modern subsoil.
(102)	Natural Substrate	Yellow-brown compact sandy clay.
(103)	Deposit	Crushed hardcore in Trenches C and D.
(104)	Deposit	Modern backfill.
(105)	Deposit	Concrete block embedded in natural clay in Trench D.
(106)	Deposit	Concrete wall footing in Trench B.
(107)	Deposit	Packing material for wall footing (106).
(108)	Deposit	Concrete drain in Trench A.

***Table 1**. List of Contexts issued during the Evaluation*

APPENDIX 2: BRIEF

Tyne and Wear Specialist Conservation Team

Specification for Preliminary Archaeological Evaluation at Land off access road to A1290, Nissan, Washington Road, Usworth

Planning Application: 09/02486/FUL

Author:

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West Chapel

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Date: 3 September 2009

County Archaeologist's Reference Number: MON7453

The Tyne and Wear Specialist Conservation Team is the curatorial service for archaeology, industrial archaeology and historic buildings throughout the Tyne and Wear districts. It helps and advises Newcastle, Gateshead, North Tyneside, South Tyneside and Sunderland Councils to carry out their statutory duties to care for the precious historic environment of Tyneside and Wearside. The Team can be found at the Strategic Housing, Planning and Transportation Division of the Environment & Regeneration Directorate of Newcastle City Council.

Introduction

Site grid reference: NZ 340 588

Planning permission has been granted for a two storey office and teaching facility comprising of classrooms, lecture theatre, café, offices and learning resource centre. Attached to this will be a steel portal framed training facility for motor manufacturing and productivity. An

archaeological desk based assessment has been produced (North Pennines Archaeology Ltd, June 2009). The appointed archaeologist must familiarise themselves with the results of this previous archaeological work on the site before starting work.

The report concludes that the site was undeveloped until the construction of the airfield in 1916. Hylton or West Moor Airfield was a Flight Station for 'B' Flight of 36 Squadron. By 1917 it was used by 'A' Flight and was also known as Usworth. There were buildings associated with the airfield within the development site in 1934. They were probably timber buildings on brick or concrete footings. Buildings were present throughout World War Two and into the 1950s. A plan of 1945 identifies some of the buildings within the site as a fire tender garage, MT sheds, station offices and workshops.

The eastern part of the site has been landscaped. The western side is grassed with trees and also landscaped. In accordance with PPG16 and UDP Policy B14 a programme of archaeological evaluation is required to ascertain if any trace of these buildings survives.

Research Aims and Objectives

The evaluation report should make reference to Regional and Thematic Research Frameworks. The North-East Regional Research Framework for the Historic Environment (2006) notes the importance of research as a vital element of development-led archaeological work. It sets out key research priorities for all periods of the past allowing commercial contractors to demonstrate how their fieldwork relates to wider regional and national priorities for the study of archaeology and the historic environment. The aim of NERRF is to ensure that all fieldwork is carried out in a secure research context and that commercial contractors ensure that their investigations ask the right questions.

See http://www.algao.org.uk/Association/England/Regions/ResFwks.htm

Ideally and where possible the evaluation should cross-reference its aims and objectives to national priorities, defined in SHAPE (Strategic Frameworks for Historic Environment Activities and Programmes in English Heritage), and the English Heritage Research Agenda 2005-2010.

Where appropriate note any similar nationwide projects using ADS, internet search engines, ALSF website, HEEP website, OASIS, NMR excavation index. All staff on site must understand the project aims and methodologies.

Methods statement

Four evaluation trenches are needed to inform the Planning Authority of the character, nature, date, depth, degree of survival of archaeological deposits on this site. The excavation must be carried out by a suitably qualified and experienced archaeological organisation. The work will record and environmentally sample any

archaeological deposits of importance found on the plot. The purpose of this brief is to obtain tenders for this work. The report must be the definitive record for deposition in the Tyne and Wear HER, and it must contain recommendations for any further archaeological work needed on this site. The commissioning client needs to be aware that the purpose of the preliminary

evaluation is merely to ascertain if archaeological remains survive on this site and if they do, to determine their broad date, nature and function. Where archaeological remains are found in the preliminary trenches, and if these remains are at threat by the proposed development, further archaeological excavation and or a watching brief will be required before and during development work.

All staff employed by the Archaeological Contractor shall be professional field archaeologists with appropriate skills and experience to undertake work to the highest professional standards. The work will be undertaken according to English Heritage Guidelines – Managing Archaeological Projects 2nd Edition ('MAP2') 1991 (www.englishh.gov.uk/ guidance/ map2/ index.htm) and Management of Research Projects in the Historic Environment (MoRPHE) – The MoRPHE Project Managers' Guide, Project Planning Notes and Technical Guides 2006 (www.englishheritage.org.uk/publications).

The work will be undertaken according to MoRPHE Project Planning Notes 2006 - PPN3 – Archaeological Excavation and PPN6 – Development of Procedural standards and guidelines for the historic environment.

All work must be carried out in compliance with the codes of practice of the Institute of Field Archaeologists and must follow the IFA Standard and Guidance for Archaeological Field Evaluations, Excavation or Watching Briefs as appropriate. www.archaeologists.net

Notification

The County Archaeologist needs to know when archaeological fieldwork is taking place in Tyne and Wear so that he can inform the local planning authority and can visit the site to monitor the work in progress. The Archaeological Contractor must therefore inform the County Archaeologist of the start and end dates of the Evaluation. He must also keep the County Archaeologist informed as to progress on the site. The CA must be informed of the degree of archaeological survival and of any significant finds. The Client will give the County Archaeologist reasonable access to the development to undertake monitoring.

PROJECT INITIATION

PROJECT DESIGN

Because this is a detailed specification, the County Archaeologist does not require a Project Design from the appointed archaeologist. However a health and safety statement and risk assessment, identifying potential risks in a risk log (see template in appendix 2 of The MoRPHE Project Manager's Guide) and specifying suitable countermeasures and contingencies, is required to be submitted to the commissioning client.

The Management of Research Projects in the Historic Environment (MoRPHE) – The MoRPHE Project Managers' Guide 2006 contains general guidance on Risk management (section 2.3.2, Appendix 2).

Risk assessments must be produced in line with legislative requirements (for example the Health and Safety at Work Act 1974, the Management of Health and Safety at Work Regulations 1999, the Control of Substances Hazardous to Health (COSHH) Regulations 2002

and the Personal Protective Equipment at Work Regulations 2002) and best practice e.g. as set out in the SCAUM (Standing Conference on Archaeological Unit Managers) Health and Safety Manual http://www.scaum.org/uk

Detailed information on hazards and how to carry out a risk assessment can be obtained from the Health and Safety Executive (www.hse.gov.uk) and the local authority health and safety department.

Specific guidance for land contamination and archaeology can be obtained from the Institute for Archaeologists (www.archaeologists.net), the Construction Industry Research and Information Association (www.contaminated-land.org) and the Association of Geotechnical and Geoenvironmental Specialists (www.ags.org.uk). See also Environment Agency, 2005 "Guidance on Assessing the Risk Posed by Land Contamination and its Remediation on Archaeological Resource Management".

The Archaeological Contractor must be able to provide written proof that the necessary levels of Insurance Cover are in place. The Archaeological Contractor must detail measures taken to ensure the safe conduct of excavations, and must consult with the client's structural engineers concerning working in close proximity to the foundations of the surrounding buildings. The Client may wish to see copies of the Archaeological Contractor's Health and Safety Policies.

The Archaeological Contractor must maintain a Site Diary for the benefit of the Client, detailing the nature of work undertaken on a day by day basis, with full details of Site Staff present, duration of time on site, etc. and contact with third parties.

PROJECT EXECUTION

1) Archaeological evaluation

The appointed archaeological contractor will decide where best to put the trenches to avoid the most obviously landscaped parts of the site. The dimensions of the four trenches are each 1.5m x 20m in plan at base. The trenches will be located on the sites of former buildings as shown on the plan of 1945 (figure 10 in the desk based assessment).

A trench location plan will be sent to the Archaeology Officer for approval before starting work. Trench locations can be adjusted to avoid services or for practical or safety purposes. Trenches can be widened if feasible in order to step the sides to reach depths over 1.2m where necessary, otherwise shoring will be required. Trenches must avoid known services.

Trenches must stay a safe distance away from pylons and overhead power lines. The commissioning client will advise of any ecological or biodiversity issues which need to be taken into consideration. The commissioning client will advise of any protected trees which must be avoided by the evaluation. Damage to trees covered by a Tree Protection Order carries a substantial fine.

Trench positions should be accurately surveyed prior to excavation and tied in to the national grid. The trenches should be excavated to the depth natural subsoil if this can be reached safely.

Tasks

Hand excavation, recording and environmental sampling (as stipulated below) of deposits down to the depth specified above. Any modern overburden or levelling material can be machined-off using a wide toothless ditching bucket under strict archaeological supervision and the remaining deposits are to be excavated by hand. All faces of the trench that require examination or recording will be cleaned.

Excavation is to be carried out with a view to avoid damage to any archaeological features which appear to worthy of preservation in-situ. Excavation is to be carried out by single context planning and recorded on *pro-forma* context sheets. Features over 0.5 m in diameter can be half sectioned.

Environmental sampling (and where relevant scientific dating) are compulsory parts of the evaluation exercise. All tenders will give a price for the assessment, full analysis, report production and publication per environmental and scientific dating sample as a contingency.

Samples will be taken of bricks from any brick-built structures. The dimensions of the bricks and the type of bonding must be recorded. Scientific investigations should be undertaken in a manner consistent with "The Management of Archaeological Projects", English Heritage 1991 and with "Archaeological Science at PPG16 Interventions: Best Practice for Curators and Commissioning Archaeologists", English Heritage, 2003. Advice on the sampling strategy for environmental samples and samples for scientific dating etc. must be sought from Jacqui Huntley, English Heritage Regional Advisor for Archaeological Science (jacqui.huntley@english-heritage.org.uk or 07713 400387) before the evaluation begins. See Appendix 1 for more information.

See Appendix 2 for guidance on procedures relating to human remains.

See Appendix 4 for guidance on Treasure Act procedures.

The spoil can be kept close-by and rapidly backfilled into the trenches at the conclusion of this work.

Recording

A full written, drawn (accurate scale plans, elevations and section drawings) and photographic record (of all contexts in black and white print and colour transparency with clearly visible graduated metric scale) will be made. The finished report must include a plan and section of each trench (even where no archaeological remains are recorded) plus plans and sections through excavated archaeological features.

The plans will include at least two site grid points and will show section line end points.

The plans will depict building material (i.e. brick and stone) where a complex of structures has been found.

Where there is a complex of interlocking multi-phased structures, a phasing plan will also be included.

There will be elevation drawings of any standing structures such as walls.

Pro-forma context sheets will be used.

All deposits and the base of the trench will be levelled. Levels will be expressed as metres above Ordnance Datum.

Stratigraphy shall be recorded even when no archaeological features have been recognised.

A 'Harris' matrix will be compiled where stratified deposits are recorded.

2) Post-excavation and report production

Finds Processing and Storage

The Archaeological Contractor will process and catalogue the finds in accordance with Museum and Galleries Commissions Guidelines (1992) and the UKIC Conservation Guidelines, and arrange for the long term disposal of the objects on behalf of the Client. A catalogue of finds and a record of discard policies, will be lodged with the finds for ease of curation. Finds shall be recorded and processed in accordance with the IFA Guidelines for

Finds Work

Finds will be assessed by an experienced finds specialist. Human and animal bone assemblages should be assessed by a recognised specialist (see Appendices 2 and 3 for more information). Industrial slag and metal working debris will be assessed by a specialist. Assessment should include x-radiography of all iron objects (after initial screening to exclude recent debris) and a selection of non-ferrous artefacts (including all coins). Refer to "Guidelines on the x-radiography of archaeological metalwork, English Heritage, 2006.

Brick dimensions will be measured and a note made of the bonding material. If necessary, pottery sherds and bricks should be recommended for Thermoluminescence dating.

Finds processing, storage and conservation methods must be broadly in line with current practice, as exemplified by the IFA "Standard and guidance for the collection, documentation, conservation and research of archaeological materials", 2001. Finds should be appropriately packaged and stored under optimum conditions, as detailed in the RESCUE/UKIC publication "First Aid for Finds"

(Watkinson and Neal 1998). Proposals for ultimate storage of finds should follow the UKIC publication "Guidelines for the Preparation of Excavation Archives for Long-term Storage" (Walker 1990). Details of methodologies may be requested from the Archaeological Contractor.

Other useful guidance – "A Strategy for the Care and Investigation of Finds",

English Heritage, 2003, "Finds and Conservation Training Package", English Heritage, 2003.

All objects must be stored in appropriate materials and conditions to ensure minimal deterioration. Advice can be sought from Jacqui Huntley of English Heritage (07713 400387) where necessary.

PRODUCTS

The report

1. The Archaeological Contractor must produce an interim report of 200 words minimum, two weeks after the completion of the field-work, for the Client and the Planning Authority, with a copy for information to the County Archaeologist. This will contain the recommendations for any further work needed on site.

2. The production of Site Archives and Finds Analysis will be undertaken according to English Heritage Guidelines - Managing Archaeological Projects 2nd Edition ('MAP2') 1991 and Management of Research Projects in the Historic Environment (MoRPHE) 2006.

3. A full archive report or post-excavation assessment, with the following features should be produced within six months of the completion of the fieldwork. All drawn work should be to publication standard. The report must include:

* Location plans of trenches and grid reference of site

* Site narrative – interpretative, structural and stratigraphic history of the site

* Plans showing major features and deposit spreads, by phase, and section locations

* Sections of the two main trench axes and through excavated features with levels

* Elevation drawings of any walls etc. revealed during the excavation

* Artefact reports – full text, descriptions and illustrations of finds

* Tables and matrices summarising feature and artefact sequences.

* Archive descriptions of contexts, grouped by phase (not for publication)

* Deposit sequence summary (for publication/deposition)

* Colour photographs of trenches and of archaeological features and finds

* Laboratory reports and summaries of dating and environmental data, with collection methodology.

* A consideration of the results of the field-work within the wider research context (ref. NERRF).

* Recommendations for further work on site, or further analysis of finds or environmental samples

* Copy of this specification

4. Three bound and collated copies of the report need to be submitted:

• one for the commissioning client

• one for the planning authority (Sunderland City Council) – this must be formally submitted by the developer to the planning department with the appropriate fee.

• one for deposition in the County HER at the address below. A digital copy of the report on CD is also required by the HER in a plastic case. Please do not attach this to the report. The report and CD for the HER must be sent by the archaeological consultant or their client directly to the address below. If the report is sent via the planning department, every page of the report will be stamped with the planning application number which ruins the illustrations. The HER is also often sent a photocopy instead of a bound colour original which is unacceptable.

Publication

If significant archaeological features are found during the evaluation, the results may also warrant publication in a suitable archaeological journal. The tender should therefore include an estimated figure for the production of a short report of, for example 20 pages, in a journal such as Archaeologia Aeliana, the Arbeia Journal, Industrial Archaeology Review or Durham Archaeological Journal. This is merely to give the commissioning client an indication of potential costs. Before preparing a paper for publication, the archaeological contractor must discuss the scope, length and suitable journal with the County Archaeologist.

Archive Preparation and Dissemination

The archive should be a record of every aspect of an archaeological project – the aims and methods, information and objects collected, results of analysis, research, interpretation and publication. It must be as complete as possible, including all relevant documents, records, data and objects {Brown, 2007, 1}.

The site archive (records and materials recovered) should be prepared in accordance with Managing Archaeological Projects, Second Edition, 5.4 and appendix 3 (HBMC 1991), MoRPHE Project Planning Notes 2006 PPN3 – Archaeological Excavation, "Archaeological documentary archives" IFA Paper No. 1, "Archaeological Archives – creation, preparation, transfer and curation"Archaeological Archives Forum etc., Guidelines for the Preparation of Excavation Archives for Long Term Storage (UKIC 1990) and "Archaeological Archives – A guide to best practice in creation, compilation, transfer and curation" by Duncan H. Brown, Archaeological Archives Forum, July 2007.

Documentary Archive

The documentary archive comprises all records made during the archaeological project, including those in hard copy and digital form. This should include written records, indexing, ordering, quantification and checking for consistency of all original context sheets, object records, bulk find records, sample records, skeleton records, photographic records (including negatives, prints, transparencies and x-radiographs), drawing records, drawings, level books, site note-books, spot-dating records and conservation records, publication drafts, published work, publication drawings and photographs etc.

A summary account of the context record, prepared by the supervising archaeologist, should be included. All paper-based material must at all times be stored in conditions that minimise the risk of damage, deterioration, loss or theft. Do not fold documents. Do not use self-adhesive labels or adhesive or tape of any kind. High quality paper (low-acid) and permanent writing materials must be used.

Original drawings on film must be made with a hard pencil, at least 4H. Do not ink over original pencil drawings. Use polyester based film for drawings (lasts longer than plastic).

Store documents in acid-free, dust-proof cardboard boxes. Store documents flat. All documents must be marked with the project identifier (e.g. site code) and/or the museum accession number. All types of record must use a consistent terminology and format.

Use non-metal fastenings, and packaging and binding materials that ensure the longevity of documents. Copies of reports and appropriate drafts, with associated illustrative material, must be submitted for inclusion with the archive.

Material Archive

The material archive comprises all objects (artefacts, building materials or environmental remains) and associated samples of contextual materials or objects. All artefacts and ecofacts retained from the site must be packed in appropriate materials. All finds must be cleaned as appropriate to ensure their long-term survival.

All metal objects retained with the archive must be recorded by x-radiograph (except gold or lead alloys or lead alloys with a high lead content and objects too thick to be x-rayed effectively e.t.c.)

All finds must be marked or labelled with the project and context identifiers and where relevant the small-finds number. Use tie-on rot-proof labels where necessary. Bulk finds of the same material type, from the same context, may be packed together in stable paper or polythene bags. Mark all bags on the outside with site and context identifiers and the material type and include a polyethylene label marked with the same information.

Use permanent ink on bags and labels. Sensitive finds must be supported, where appropriate, on inert plastic foam or acid-free tissue paper. It is not advisable to wrap objects in tissue as the unwrapping could cause damage.

The archive will be placed in a suitable form in the appropriate museum (typically the Museum of Antiquities for Newcastle (stores in Bedson Building and at Team Valley) and Tyne and Wear Museums for the rest of Tyne and Wear (check with these institutions) with the landowner's permission. Contact Andrew Parkin at the Museum of Antiquities (0191 2228996) and Alex Croom at Tyne and Wear Museums (0191 4544093).

A letter will be sent to the County Archaeology Officer within six months of the report having been submitted, confirming where the archive has been deposited.

Digital Archive

See MoRPHE Technical Guide 1 – Digital Archiving & Digital Dissemination 2006.

SIGNPOSTING

OASIS

The Tyne and Wear County Archaeologist supports the Online Access to the Index of Archaeological Investigations (OASIS) project. This project aims to provide an online index/access to the large and growing body of archaeological grey literature, created as a result of developer-funded fieldwork.

The archaeological contractor is therefore required to register with OASIS and to complete the online OASIS form for their evaluation at http://www.oasis.ac.uk/.

Please ensure that tenders for this work takes into account the time needed to complete the form.

Once the OASIS record has been completed and signed off by the HER and NMR the information will be incorporated into the English Heritage Excavation Index, hosted online by the Archaeology Data Service.

The ultimate aim of OASIS is for an online virtual library of grey literature to be built up, linked to the index. The unit therefore has the option of uploading their grey literature report as part of their OASIS record, as a Microsoft Word document, rich text format, pdf or html format. The grey literature report will only be mounted by the ADS if both the unit and the HER give their agreement. The grey literature report will be made available through a library catalogue facility.

Please ensure that you and your client understand this procedure. If you choose to upload your grey literature report please ensure that your client agrees to this in writing to the HER at the address below.

For general enquiries about the OASIS project aims and the use of the form please contact: Mark Barratt at the National Monuments Record (tel. 01793 414600 or oasis@english-heritage.org.uk). For enquiries of a technical nature please contact: Catherine Hardman at the Archaeology Data Service (tel. 01904 433954 or oasis@ads.ahds.ac.uk). Or contact the Tyne and Wear Archaeology Officer at the address below.

The tender

Tenders for the work should contain the following:-

1. Brief details of the staff employed and their relevant experience

2. Details of any sub-contractors employed

3. A quotation of cost, broken down into the following categories:-

* Costs for the excavation, incl. sub-headings of staff costs on a person-day basis, transport, materials, and plant etc.

* Post-excavation costs, incl. storage materials

* Cost of Environmental analysis and scientific dating per sample

* Estimated cost for full publication of results in an archaeological journal

* Overheads

4. An indication of the required notification period (from agreement to start date) for the field-work; the duration of fieldwork and the expected date for completion of the post-excavation work (a maximum of 6 months after completion of the fieldwork)

Monitoring

The Archaeological Contractor will inform the County Archaeologist of the start and end dates of the excavation to enable the CA to monitor the work in progress. Should important archaeological deposits

be encountered, the County Archaeologist must be informed. If further archaeological evaluation is required on this site, then the archaeological contractor must submit a written scheme of investigation for approval by the CA before extending the size of the trenches.

APPENDICES

1 Environmental Sampling, Scientific Analysis and Scientific Dating

This is a compulsory part of the evaluation exercise. Scientific investigations should be undertaken in a manner consistent with "The Management of Archaeological Projects", English Heritage 1991 and with "Archaeological Science at PPG16 Interventions: Best Practice for Curators and Commissioning Archaeologists", English Heritage, 2003.

Aims of environmental sampling – to determine the abundance/concentration of the material within the features and how well the material is preserved, to characterise the resource (the site) and each phase, to determine the significance of the material and its group value, what crop processing activities took place on the site? What does this tell us about the nature of the site? Is there any evidence for changes in the farming practice through time? How did people use this landscape? Can we place certain activities at certain locations within the site?

Function and date of individual features such as pits, hearths etc. Are the charred assemblages the result of ritual deposition or rubbish? Is the charcoal the result of domestic or industrial fuel?

Advice on the sampling strategy for environmental samples and samples for scientific dating etc. must be sought from Jacqui Huntley, English Heritage Regional Advisor for Archaeological Science (07713 400387) before the evaluation begins. The sampling strategy should include a reasoned justification for selection of deposits for sampling.

Deposits should be sampled for retrieval and assessment of the preservation conditions and potential for analysis of biological remains (English Heritage 2002). Flotation samples and samples taken for coarse-mesh sieving from dry deposits should be processed at the time of fieldwork wherever possible. Sieving recovers fish, amphibian, small bird and mammal bone, small parts of adult mammals and young infused bones which may be under-represented otherwise. However it is noted that clay soils in this region make sieving difficult. Discuss the potential for sieving with Regional Advisor for Archaeological Science.

Environmental samples (bulk soil samples of 30-40 litres volume) will be collected by the excavator from suitable (i.e. uncontaminated) deposits. It is suggested that a large number of samples be collected during evaluation from which a selection of the most suitable (uncontaminated) can be processed. All tenders will give a price for the assessment, full analysis, report production and publication per sample. The full 30-40 litre sample must be assessed by the laboratory, not just a small sub-sample.

Deposits will be assessed for their potential for radiocarbon, archaeomagnetic (guidance is available in the Centre for Archaeology Guideline on Archaeometallurgy 2001) and Optically Stimulated Luminescence dating. Timbers will be assessed for their potential for dendrochronology dating. Sampling should follow procedures in "Dendrochronology: guidelines on producing and interpreting dendrochronological dates", Hillam, 1998. All tenders will quote the price of these techniques per sample.

The following information should be provided with the environmental samples to be processed – brief account of nature and history of the site, aims and objectives of the project, summary of archaeological results, context types and stratigraphic relationships, phase and dating information, sampling and processing methods, sample locations, preservation conditions, residuality/contamination etc.

Laboratory processing of samples shall only be undertaken if deposits are found to be reasonably well dated, or linked to recognisable features and from contexts the derivation of which can be understood with a degree of confidence.

A range of features, and all phases of activity, need to be sampled for charred plant remains and charcoal. Aceramic features should not be avoided as the plant remains from these features may help to date them. Deep features should be sampled in spits to pick up changes over time. Part, or all of each of the contexts should be processed. In general samples should be processed in their entirety. All flots should be scanned, and some of the residues.

Pollen

Pollen samples can be taken from features such as lakes, ponds, palaeochannels, estuaries, saltmarshes, mires, alluvium and colluvium, and from waterlogged layers in wells, ditches and latrines etc. Substances such as honey, beer or food residues can be detected in vessels. Activities such as threshing, crop processing and the retting of flax can be identified. When taken on site, pollen samples should overlap. Your regional science advisor can advise on the type of corer or auger which would be most appropriate for your site. Samples need to be wrapped in clingfilm and kept dark and cool. Make a description of the sediments in which the pollen was found, and send this with the sample to be assessed.

Forams and diatoms

Coastal or estuary sites (even those which are now well drained) are suitable for sampling for foraminifera. Diatoms can also be found on marine sites, but also in urban settings (sewers, wells, drains, ditches etc). They only survive in waterlogged conditions. These aquatic microfossils are used as proxy indicators of the former aquatic ecological conditions on site, changes in sea levels and temperature, salinity, PH and pollution. Forams are taken from cores, monolith tins or bulk samples. Diatoms are cut from monolith tins or cores or taken as spot

samples.

Insects

Insects, which are useful as palaeoenvironmental indicators, survive best in waterlogged deposits such as palaeochannels and wells. They can provide information on climate change and landscape reconstruction as some species are adapted to particular temperatures, habitats or even particular trees. Certain insects can indicate the function of a feature or building (eg. Weevils, which were introduced by the Romans, often indicate granary sites, parasites will indicate the presence of particular animals such as sheep or horse, latrine flies survive in the

mineral deposits in latrines, or in the daub of medieval buildings etc). Samples need to be sealed (eg. in a plastic box).

Industrial Activity

Where there is evidence for industrial activity, macroscopic technological residues should be collected by hand. Separate samples should be collected for microslags (hammer-scale and spherical droplets). Guidance should be sought from the English Heritage Regional Science Adviser on the sampling strategy for metalworking features and advice on cleaning and packaging. Specialist on-site advice must be sought on identification of metalworking features. Slag and metal working debris must be assessed by a specialist. Scientific analysis (such as x-ray fluorescence, chemical analysis, metallography or scanning electron microscope) of slag can provide information on the melting temperature, chemical composition (is it iron, zinc, copper etc), microstructure (the type and shape of the crystals), physical properties (the hardness or viscosity), isotopic composition (strontium_87 or strontium_88 etc) and mineralogical composition. Guidance is available in the English Heritage "Archaeometallurgy" guidelines, 2001; "Archaeomagnetic dating", 2006 and "Guidelines on the X-radiography of archaeological metalwork", 2006. See also Historical Metallurgy Society, 2008, "Metals and metalworking: a research framework for archaeometallurgy".

Buried soils and sediments

Buried soils and sediment sequences should be inspected and recorded on site by a recognised geoarchaeologist. Procedures and techniques in the English Heritage document "Environmental Archaeology", 2002 and "Geoarchaeology", 2004 should be followed.

Wood

Sampling strategies for wooden structures should follow the methodologies presented in "Waterlogged wood. Guidelines on the recording, sampling, conservation and curation of waterlogged wood" R. Brunning, 1996. If timbers are likely to be present on your site, contact a wood specialist beforehand. Preexcavation planning – determine questions to ask, agree on a sampling strategy, allocate reasonable time and budget. Soil samples should be taken of the sediments surrounding the timber. Keep the timbers wet! Record them asap onsite – plan, photograph, record the size and orientation of the wood (radial, tangential,transverse), any toolmarks, joints, presence of bark, insect damage, recent breaks, and if another piece of wood was on top of or below the piece sampled. Both vertical and horizontal positioning of wattling must be recorded. Wood samples can provide information on woodland management such as medieval coppicing, type of taxa (native or foreign), conversion technology (how the wood was turned into planks), building techniques and type of tools used. Suitable samples should be submitted for dendrochronological dating. See English Heritage guidelines, 2004, "Dendrochronology".

Leather and organic materials

Waterlogged organic materials should be dealt with following recommendations in "Guidelines for the care of waterlogged archaeological leather", English Heritage and Archaeological Leather Group 1995.

2 Animal Bone

Animal bone can explore themes such as hunting and fowling, fishing, plant use, trade network, seasonality, diet, butchery, animal husbandry, food procurement, age structures, farrowing areas, species ratios, local environment. Domestic animal bone was used in prehistoric and Roman cremation rituals. Post medieval cattle bones – small cow bones invariably represent animals which produced high quality buttermilk for cheese. Big 'improved' cattle with large bones were produced for large quantities of meat and poorer quality milk. Large and small cattle bones are often found together on post medieval sites, usually with less of the small bones.

Animal bone assemblages should be assessed by a recognised specialist. The specialist will need to know a brief account of the nature and history of the site, an account of the purpose, methods (details of sampling) for recovery of animal bones, and the main aims and results of the excavation, details of any specific questions that the excavator wants the animal bone specialist to consider, information about other relevant finds from the excavation (e.g. bone tools, fishing equipment, weaving equipment), specific information about each context that has produced significant quantities of animal bone (recovery method, phase, context type, position in relation to major structures, contamination by more recent material, some indication of the amount of bone (by weight or by container size). See "Ancient Monuments Laboratory Advisory Note, "Assessment of animal bone collections from excavations", Sebastian Payne, 1991and "The Assessment of a collection of animal bones", S. Davis, n.d., Ancient Monuments Laboratory.

Fish bone – there was some herring exploitation in the early medieval period. Christian fasting from around 970 allowed fish to be eaten on Fridays which led to a huge demand for fish. There was an increase in marine fishing, fish trade and fish consumption (cod, haddock, ling, herring etc) around 1000 AD. Middens provide evidence of commercial fishing. There was a decline in freshwater fish (cyprinid or carp, salmon, smelt, eel, pike) from the eleventh century.

Smoking fish is a recent practice. They were previously air dried and salted. Newcastle was a major port. Samples should be sieved to retrieve fish and bird bones along with small parts of other animal skeletons and young infused bones. A crane bone was recovered from excavations at Tuthill Stairs, Newcastle – a rare find. Herring bones are so small that they can only be retrieved by 2mm sieving. Clay soils are difficult to sieve, hot water can help. Acidic soils mean poor preservation of bone.

See English Heritage 2002, "Environmental Archaeology – a guide to the theory and practice of methods from sampling and recovery to post excavation", Centre of Archaeology Guideline 1. Isotope analysis can determine where the fish were coming from – North Sea, Scandinavia, Newfoundland, Iceland etc.

There is an excellent reference collection of fish bone at York. Fish bones should be archived to museums for future dating and isotope analysis where this is not undertaken as part of the post-excavation process.

www.fishlab.org

3 Human Remains

Human remains must be treated with care, dignity and respect. Excavators must comply with the relevant legislation (essentially the Burial Act 1857) and local environmental health concerns. If found, human remains must be left in-situ, covered and protected. The archaeological contractor will be responsible for informing the police, coroner, local Environmental Health department and the County Archaeologist. If it is agreed that removal of the remains is essential, the archaeological contractor will apply for a licence from the Home Office and their regulations must be complied with.

Site inspection by a recognised osteologist is desirable for isolated burials and essential for cemeteries. The remains will be recorded in-situ and subsequently lifted, washed in water (without additives). They will be marked and packed to standards compatible with "Excavation and post-excavation treatment of cremated and inhumed human remains", McKinley and Roberts, 1993. After excavation, the remains will be subject to specialist assessment. Analysis of the osteological material should take place according to published guidelines "Human Remains from Archaeological Sites, Guidelines for producing assessment documents and analytical reports, English Heritage, 2002.

Some of the potential benefits from the study of human skeletons – demography, growth profiles, patterns of disease, genetic relationships, activity patterns, diet, burial practices, human evolution. New scientific techniques available include DNA and stable isotope analyses.

Diseases which yield ancient DNA – leprosy, syphilis, tuberculosis, mycobacterium bovis (animal form of TB passed to humans when they shared a living space from Neolithic period onwards). Cremation destroys the crown of the tooth so it cannot be dated (the closure of the cranium vault can be used in adults for dating instead). Cremation also fragments bone, distorts it due to lack of water, shrinks the bone, causes microstructural alteration and destroys organic components (so DNA analysis not possible).

The final placing of the remains after scientific study and analysis will be agreed beforehand.

Further guidance is available in:

"Guidance for best practice for treatment of human remains excavated from

Christian burial grounds in England", The Church of England and English Heritage, 2005 (www.english-heritage.org.uk/upload/pdf/16602_HumanRemains1.pdf)

"Church Archaeology: its care and management", Council for the Care of Churches, 1999

The Advisory Panel on the Archaeology of Christian burials in England can provide free well-informed advice with consideration of relevant religious, ethical, legal, archaeological and scientific issues. Panel's website:

http://www.britarch.ac.uk/churches/humanremains/index.html

or email the secretary simon.mays@english-heritage.org.uk

4 Treasure

Defined as:

• Any metallic object, other than a coin, provided that at least 10% by weight of metal is precious metal and that is at least 300 years old when found

• Any group of two or more metallic objects of any composition of prehistoric date that come from the same find

• All coins from the same find provided that they are at least 300 years old when found, but if the coins contain less than 10% gold or silver there must be at least ten

• Any object, whatever it is made of, that is found in the same place as, or had previously been together with, another object that is Treasure

• Any object that would previously have been treasure trove, but does not fall within the specific categories given above. Only objects that are less than 300 years old, that are made substantially of gold or silver, that have been deliberately hidden with the intention of recovery and whose owners or heirs are unknown will come into this category

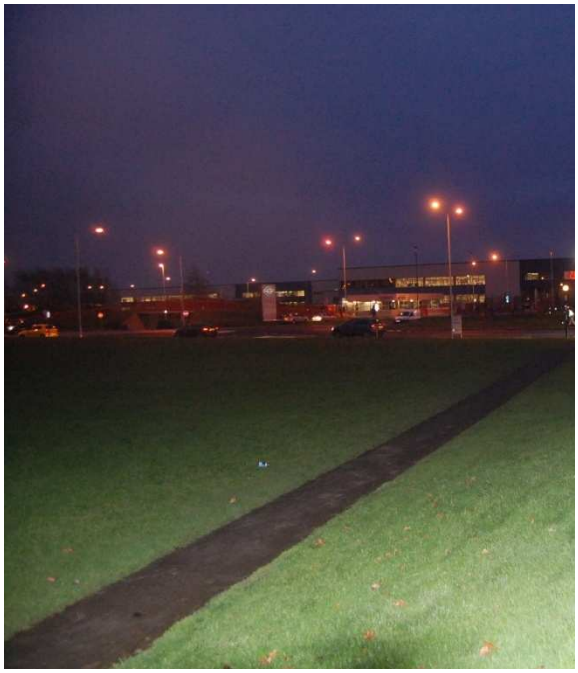
If anything is found which could be Treasure, under the Treasure Act 1996, it is a legal requirement to report it to the local coroner within 14 days of discovery. The Archaeological Contractor must comply with the procedures set out in The Treasure Act 1996. Any treasure must be reported to the coroner and to The Portable Antiquities Scheme Finds Liaison Officer, Rob Collins (0191 2225076 or Robert.Collins@newcastle.ac.uk) who can provide guidance on the Treasure Act procedures.

If you need this information in another format or language, please contact

Jennifer Morrison, Archaeology Officer.

APPENDIX 3: FIGURES

ACCESS ROAD TO A1290, NISSAN WORKS, WASHINGTON ROAD, USWORTH, TYNE AND WEAR



PRELIMINARY EVALUATION REPORT

CP. NO: 1016/09

16/12/2009

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Quality Assurance

This report covers works as outlined in the brief for the above-named project as issued by the relevant authority, and as outlined in the agreed programme of works. Any deviation to the programme of works has been agreed by all parties. The works have been carried out according to the guidelines set out in the Institute for Archaeologists (IfA) Standards, Policy Statements and Codes of Conduct. The report has been prepared in keeping with the guidance set out by North Pennines Archaeology Ltd on the preparation of reports.

REVISION SCHEDULE			
	01	**02**	**03**
PREPARED BY: **POSITION:** **DATE:**	Tony Liddell Supervisor 16/12/2009		
EDITED BY: **POSITION:** **DATE:**	Martin Railton Project Manager 16/12/2009		
APPROVED BY: **POSITION:** **DATE:**	Frank Giecco Principal Archaeologist 16/12/2009		

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SUMMARY

In December 2009, North Pennines Archaeology Limited undertook an archaeological evaluation on land off the A1290 by the Nissan Works at Washington, Sunderland, Tyne and Wear (NGR: NZ 340 588). This was at the request of MDA Developments Ltd, and was in advance of the submission of a planning application for a sustainable manufacturing centre by Gateshead College (Planning Application 09/02486/FUL).

The town of Washington is situated approximately 9km to the west of Sunderland, on the north side of the River Wear. The Nissan factory is located between Sunderland and Washington, on the west side of the A19 and to the north of the A1231, and the development site is directly north of the factory. The development site lies within an area formerly occupied by an airfield constructed in 1916. Hylton or West Moor Airfield was a Flight Station for 'B' Flight of 36 Squadron. In 1917, the airfield was renamed 'Usworth' and was used by 'A' Flight. Previous archaeological research into the site revealed that there were still buildings associated with this early airfield in 1934, with further buildings present throughout the Second World War and into the 1950s. In accordance with PPG16 and UDP Policy B14 a programme of archaeological evaluation was required to ascertain if any trace of these buildings survive.

The field evaluation consisted of four trial trenches, located to target specific remains of buildings from the First World War airfield: the Main Stores, Motor Transport Sheds and Office and the Workshops.

The trenching revealed a relatively uniform stratigraphy, with natural clay underlying all trenches at an average height of 32.83mOD. All trenches contained a modern 20th century deposit overlying the natural substrate, the top of which averaged a datum height of 33.14m. This deposit indicates the level taken during the clearance of the site with any remains of the airfield buildings removed to this depth or below. This deposit also represents the depth of overburden stripped to during the building of the Nissan Works, when the development site was used as a storage and work area: this is demonstrated by the modern crushed hardcore observed in both Trenches C and D. Trench C also showed the use of hardcore to create the landscaped bunds in the northern extent of the site, indicating that the bunds are simply landscape features rather than the remains of earlier airfield buildings.

In Trench A, a concrete drain was uncovered in the northeast corner of the trench set within the modern backfill. While this could be a remnant of the drainage system from the airfield, it is more likely to be part of a drainage system set up while the area was used as a working compound for the construction of the Nissan Works. Trench B revealed a highly truncated concrete wall footing, which bears no relation to the potential remains of the Main Stores which the trench was targeting. However, the alignment does match with the edge of the road to the east of the building, perhaps indicating that the lowest remains of the road edging still remain *in-situ*.

Overall, the trenching revealed that no remnants of the buildings targeted remain in the evaluation area, with concrete footing remains minimal at best, with the majority removed during the 1980s when the area was used as a compound during the construction of the Nissan Works to the south.

The North-East Regional Research Framework 'Shared Visions' notes that there are relatively few World War I remains in the north-east.. The Research Agenda and Strategy in this publication notes that 'remains relating to the First World War must be recorded, and that full recording is necessary of all 20th century military and defence remains where they are affected by development work'. While it is clear from the previous deskbased assessment that the development area was in use during the First and Second World Wars, the remains of the buildings from that period have been destroyed and removed during the 1980s.

ACKNOWLEDGEMENTS

North Pennines Archaeology Ltd would like to thank MDA Development Ltd for commissioning the project.

NPA Ltd would also like to thank Jennifer Morrison, Archaeology Officer for Newcastle City Council, for all her help and assistance throughout the project.

The archaeological evaluation was undertaken by Tony Liddell and Michael McElligott, with the help of machine-driver John Thralkeld. The trenches were surveyed by Matthew Town and Helen Noakes. The report was written and the drawings produced by Tony Liddell. The project was managed by Frank Giecco, Technical Director for NPA Ltd. The report was edited by Martin Railton, Project Manager for NPA Ltd.

1 INTRODUCTION

1.1 CIRCUMSTANCES OF THE PROJECT

1.1.1 In December 2009, North Pennines Archaeology Limited undertook an archaeological evaluation on land off the A1290 by the Nissan Works at Washington, Sunderland, Tyne and Wear College ([NGR: NZ 340 588]; Figure 1). This was at the request of MDA Developments Ltd, and was in advance of the submission of a planning application for a sustainable manufacturing centre by Gateshead.

1.1.2 The town of Washington is situated approximately 9km to the west of Sunderland, on the north side of the River Wear. The Nissan factory is located between Sunderland and Washington, on the west side of the A19 and to the north of the A1231, and the development site is directly north of the factory.

1.1.3 The development site lies within an area formerly occupied by an airfield constructed in 1916. Hylton or West Moor Airfield was a Flight Station for 'B' Flight of 36 Squadron. In 1917, the airfield was renamed 'Usworth' and was used by 'A' Flight. Previous archaeological research into the site revealed that there were still buildings associated with this early airfield in 1934, with further buildings present throughout the Second World War and into the 1950s (Wooler 2009). In accordance with PPG16 and UDP Policy B14 a programme of archaeological evaluation was required to ascertain if any trace of these buildings survive.

1.1.4 This report sets out the results of the work in the form of a short document outlining the findings, followed by a statement of the archaeological potential of the area, an assessment of the impact of the proposed development, and recommendations for further work.

2 METHODOLOGY

2.1 ARCHAEOLOGICAL BRIEF

2.1.1 A *Specification for Preliminary Archaeological Evaluation at Land off access road to A1290, Nissan, Washington Road, Usworth* (Morrison 2009) was produced by Newcastle City Council and a subsequent trench location plan submitted by North Pennines Archaeology Limited on behalf of the client, MDA Developments Limited, for an archaeological evaluation of the development area. The specification and trench location was agreed upon in consultation with the Archaeology Officer for Newcastle City Council.

2.1.2 Following acceptance of the trench location plan by Newcastle City Council, North Pennines Archaeology Ltd was commissioned by MDA Developments Ltd to undertake the work. The specification and trench location plan was adhered to in full, and the work was consistent with the relevant standards and procedures of the Institute for Archaeologists (IfA), and generally accepted best practice.

2.2 ARCHAEOLOGICAL EVALUATION

2.2.1 The field evaluation consisted of four trial trenches, with Trench A measuring 10.0m in length by 1.60m in width, and Trenches B-D 5.0m in length by 3.0m in width. The trenches were located to target specific remains of buildings from the Second World War airfield: the Main Stores, Motor Transport Sheds and Office and the Workshops.

2.2.2 The location and size of the trial trenches were agreed by consultation between North Pennines Archaeology Ltd and Jennifer Morrison, Archaeology Officer for Newcastle City Council.

2.2.3 The aims of the evaluation can be summarised as follows:

- to establish the presence/absence, nature, extent and state of preservation of archaeological remains and to record these where they are observed;
- to establish the character of those features in terms of cuts, soil matrices and interfaces;
- to recover artefactual material, especially that useful for dating purposes;
- to recover palaeoenvironmental material where it survives in order to understand site and landscape formation processes.

2.3 METHODOLOGY

2.3.1 The trenches were located using Trimble Zeiss 3601 Total Station survey using coordinates from the trench location plan.

2.3.2 The trenches were excavated by a mechanical excavator equipped with a toothless 1.6m wide ditching bucket, under archaeological supervision, to the top of the natural substrate. Each trench was then manually cleaned and any putative archaeological features investigated and recorded according to the North Pennines Archaeology Ltd standard procedure as set out in the NPA Excavation Manual (Giecco 2003).

2.3.3 A photographic record was made using digital photography, 400 ISO Black and White print and 200 ISO Colour Slide film.

2.3.4 All work was undertaken in accordance with the Institute for Archaeologists Standards and Guidance for Archaeological Field Evaluations (IfA 2008).

2.4 THE ARCHIVE

2.4.1 A full professional archive has been compiled in accordance with the specification, and in line with current UKIC (1990) and English Heritage Guidelines (1991) and according to the Archaeological Archives Forum recommendations (Brown 2007). The archive, including the physical and paper archive and copies of the report, will be sent to Tullie House, Carlisle, and will be made available upon request. The archive can be accessed under the unique project identifier NPA09, GCN-A, CP 1016/09.

2.4.2 North Pennines Archaeology supports the **O**nline **A**cces**S** to the **I**ndex of Archaeological Investigation**S** (**OASIS**) project. This project aims to provide an on-line index and access to the extensive and expanding body of grey literature, created as a result of developer-funded archaeological work. As a result, details of the results of this project will be made available by North Pennines Archaeology, and can be accessed under the unique identification number *northpen3- 69355*.

3 BACKGROUND

3.1 LOCATION AND GEOLOGICAL CONTEXT

3.1.1 The city of Sunderland is located in the north-east of England, approximately 16km to the south-east of Newcastle upon Tyne and c.14km to the north-east of Durham. The town of Washington is situated approximately 9km to the west of Sunderland, on the north side of the River Wear. The Nissan factory is located between Sunderland and Washington, on the west side of the A19 and to the north of the A1231.

3.1.2 The topography of the area in and around Sunderland is determined by the geological structure. The strata found in the area are carboniferous coal measures and deposited Permian limestone overlay by glacial drift and alluvium. This limestone overlay rises in a more or less gentle slope under its blanket of glacial drift from the coast to a western escarpment about 500ft above sea level (Countryside Commission 1998).

3.2 HISTORICAL CONTEXT

3.2.1 *Introduction:* this historical background is compiled from the Desk Based Assessment (Wooler 2009) and is intended only as a summary of historical developments specific to the study area.

3.2.2 The place name Usworth is thought to stem from the Old English "burn by Osa's road".

3.2.3 ***Prehistoric Period (pre c.AD 43)***: no prehistoric activity located close to the proposed development area was noted in material consulted for the Desk Based Assessment. The Archaeological Data Service, however, contains an entry in its online catalogue for a possible prehistoric or Roman rectilinear site within an oval enclosure at grid reference NZ 333 90, to the north-west of Usworth airfield, between the Three Horse Shoes and North Moor Farm.

3.2.4 In the nearby vicinity, evidence for human settlement and activity in the Hylton area comes largely from findspots. In 1885 a dug-out canoe was found in the bed of the River Wear at Hylton. A second similar canoe was already known to Sunderland Museum as they had in their collection a photograph showing a fragmentary example. This canoe was believed to have been dredged from the River Wear between Hylton Dene and Southwick. The two canoes are suggested to have dated to the late Bronze Age or the Iron Age. Other prehistoric finds within the locality of Hylton include a bronze socketed axe from the Wear and two late Bronze Age swords from the Wear at Ford. The axe and two swords (which are of the Park Ewart type) are considered to be c.900-700BC.

3.2.5 In the wider landscape, prehistoric activity is evidenced by Bronze Age burials at Humbleton Hill and Hastings Hill, and Mesolithic and Neolithic flints and arrowheads have been found at Grindon, all on the south side the River Wear. Mesolithic to late Bronze/early Iron Age occupation have been discovered at Bishopwearmouth, also on the south side of the Wear, and prehistoric burials and enclosures are known at Fulwell and Carley Hill on the north side of the river, and to the east of Hylton.

3.2.6 ***Romano-British Period (c.AD 43-400)***: in 1939, a hoard of Roman coins were found at Washington Station. The hoard contained 59 coins including one minted during the reign of Emperor Constantine (possibly 4th century AD). There is no evidence as yet for activity during this period in close proximity to the proposed development area although the cropmarks already referred to may date to this period. It has been mentioned by Mr Fulton at the North East Aircraft Museum, that 'Roman remains' were found during preparatory work for the construction of the Nissan plant on the former airfield. No written confirmation of this has, however, been found during the desk-based assessment.

3.2.7 The main evidence for occupation of the area around Sunderland during this period is in the form of burials and coins. In 1759 a cist containing a large skeleton was uncovered at Fulwell during limestone quarrying. Two coins dating from the beginning of the 3rd century were found close by. To the north, near the Carley Hill quarry, a bronze figurine of Jupiter Dolichenus, a Romano-British god, was discovered in 1820. In 1971 the hill also yielded two Roman coins dating from the 2nd to the 3rd centuries. To the west at Southwick quarry, pieces of Roman pottery, including the remains of a late 4th century cooling pot were found in 1927. Coins from the period have also been found at and around Hylton, as well as a possible Roman milestone inscribed with a dedication to the Emperor Gordian (AD 238-44) found in the Wear and recorded by the prominent antiquarian, Robert Surtees, although its exact find spot is unknown.

3.2.8 ***Early Medieval Period (c.AD 400-1066)***: the only evidence for activity or settlement during this period comes from place names, as already referred to in 3.2.2 above. What is now known as Tyne and Wear was certainly an important area during this period as show by early Christian sites such as Jarrow (HER 1227), Tynemouth (HER 124-9) and Monkwearmouth which was founded by Bishop Bishop in 674AD (HER 87). There is no evidence of activity during this period in close proximity to the proposed development area, although as with earlier periods this does not mean a total absence of settlement or land use.

3.2.9 ***Medieval Period (c.AD 1066-1485)***: there is no evidence of medieval activity in the vicinity of the proposed development area. It is possible that the land may have been on the edges of Hylton Castle estate, and may have been waste, common or agricultural in nature.

3.2.10 Hylton Castle, located to the east of the proposed development area and now surrounded by housing, was built by Sir William Hylton as a gatehouse style fortified manor house. Although no construction records survive, the style of the architecture and coats of arms on the west front mean that it dates to the 1390s or the first decade of the 1400s. Other buildings may have existed on the site at this time, as the inventory taken on Sir William's death in 1435 mentions a hall, four chambers, two barns, a kitchen and the chapel in addition to the castle. Early in the 18th century, Baron John Hylton made the first major alterations. He completely redesigned the interior and inserted large windows in the fashionable Italianate style. His son, John, made even greater alterations. He built a south wing and added crenallations to both wings. When he died in 1746, the Hyltons sold the castle, as there was no male heir to inherit it. Successive owners failed to maintain it, and in 1863 it was bought by William Briggs, who knocked down the north and south wings, gutted the interior and added new windows. The chapel at Hylton Castle, dedicated to St Catherine, is known to have existed on the site since 1157, when it was likely that Hylton Castle was a wooden building. Nothing remains of the first chapel and the ruins seen today date from the early 15th century.

3.2.11 Like the rest of Monkwearmouth parish, Hylton had presumably been part of the lands of the Anglian monastery, but after the Norman Conquest it did not pass with the other townships to the priory's monastic cell. From the 12th century, and perhaps earlier, the manor and township of Hylton belonged to the Hilton family who took their name from the estate. There is evidence that there was a mill at Hylton by the late 12th century, although its precise location if unknown. If it was a watermill if may have stood at Hylton Dene. In later centuries a windmill was sited to the north of the castle.

3.2.12 ***Post-Medieval Period (c.AD 1485-1900)***: writing in 1967, Bennett refers to the 'Blackwood' located beside Usworth Aerodrome, as providing some idea of what the countryside was like in the area before any clearance was undertaken, although the exact location of the 'Blackwood' does not appear to be shown on any historical mapping. He noted that the land between Biddick Forest and the Three Horse Shoes was drained in 1820. Oak was mainly grown in Biddick Forest, and for centuries it was exported from Sunderland port, providing a considerable trade in hardwood as well as coal.

3.2.13 Nearby Hylton Castle was the site of skirmishes during the Civil War in the middle of the 17th century. Corfe noted that these skirmishes took place on high ground to the north of the castle in 1644.

3.2.14 Industries along the Wear appear to have been well established by the early 19th century. Parson and White refer to industry at Southwick (1¼ miles north-west of Sunderland and to the east of Hylton) on the north bank of the river, which included several shipyards, lime-kilns and earthenware and glass manufactories. The trade directory in Parson and White lists the trades in the township of Hylton in 1828, these appear to be more agricultural in nature rather than industrial, apart from Auston Dixon & Co, earthenware manufacturers at Hylton Ferry and Robert Reay, shipbuilder and timber merchant at the same location. Farms such as Cow Stand (occupied by Marmaduke Robinson), West Moor (Thomas Reed) and South Moor (George and James Curry), all previously located within close proximity to the proposed development area, were all in existence at this date. The Three Horse Shoes is listed as occupied by John Merriman, victualler and blacksmith, at 'Road Stone' in Hylton township; this may be an earlier name for the site although it is not shown on later mapping. North Hylton appears to have been more industrial than the rest of the township, no doubt due to its proximity to the river. Brett refers to industries such as iron ore (on land close to the ship building yards); charcoal; lamp black; grindstones and whetstones (North Hylton had quarries that yielded grindstones in the 17th and 18th centuries) which were exported all around the world; sandstone quarried from sites such as Wood House at North Hylton; tar; a pottery had been established at North Hylton in 1762 by the Maling family. The Malings had been Huguenot refugees who settle in Scarborough before moving to Sunderland. Rich clay beds and the riverside location for east of transport on the Wood House estate made it an ideal site for a pottery. The outbreak of the Crimean War in 1854 signaled an upturn in industry in North Hylton. The old pottery building was turned into a forge and iron works and shipbuilding yards sprang up on vacant lots on the riverside.

3.2.15 With reference to Hylton Colliery (or Castletown Colliery), Brett noted that the Wearmouth Coal Company bought the Wear Steel Works, 36 acres of land and 190 workmen's cottage for £37 000. The company began work on sinking the first shaft in March 1897. In October 1900 the mine was still being developed but was still producing 500 tons of coal a day. Output almost doubled when Hylton was at its peak and the workforce topped the 1000 mark. In 1907 the coal company bought the whole of the 2000 acres Hylton Castle Estate including the castle. As they already owned the coal rights the purchase was made as an investment. In the late 1970s Hylton was one of a number of small Durham collieries which ceased mining coal, the

pit finally closed in July 1979. The colliery at Hylton (located approximately 2km to the south-east of the proposed development area) was not the only colliery site in the area; Usworth Colliery is shown on the Ordnance Survey map of 1921 (HER No. 365) and a colliery also existed at Boldon to the north which opened in 1862 and closed in 1982 (HER No. 2567). There does not appear to have been any collieries within close proximity to the proposed development area.

3.2.16 The mining of coal was greatly aided by the railways. The colliery at Usworth (NZ 315 584) was served by sidings alongside what became the North Eastern Railway line from Washington to Pelaw, ½ mile north of Usworth Station. Prior to the first locomotives, trucks on these sidings were almost certainly shunted by horses33. The Pontop and South Shields Branch of the North Eastern Railway was originally the Stanhope and Tyne Railway which opened in 1834 as the first public railway on Tyneside. It carried minerals from County Durham to the Tyne and passengers from South Shields to the Durham Turnpike (HER No. 2290). The Hylton, Southwick and Monkwearmouth Railway was formed in 1871 to develop industry on the north bank of the Tyne. It opened in 1876 between the NER line at Monkwearmouth and the NER's Tyne Dock-Consett line at Southwick Junction, although the latter connection was removed shortly after. Both the Pontop and South Shields Branch of the NER and the Hylton, Southwick and Monkwearmouth branch line are located to the west and the south of the proposed development site respectively. There was no evidence that any railway lines or associated features crossed the proposed development area.

3.2.17 ***Modern (1900-Present)***: the industrial nature of the area around Sunderland, such as shipbuilding and coal mining, meant that the town and its hinterland were obvious German targets during the First World War. In April 1916, for example, a Zeppelin passed over Seaham harbour and crossed over the colliery villages towards Washington. Fourteen explosive bombs and seven incendiary bombs were dropped within five minutes. The first bomb in Sunderland landed in a yard in Peacock Street. The Zeppelin then made its way towards Monkwearmouth goods yard, hitting North Bridge Street, the tramway sheds and the Workmen's Hall (Calvert Street). The greatest amount of damage was done to Fern Street, North Bridge Street and Victor Street.

3.2.18 As a consequence of Zeppelin raids on the area around Sunderland, an airfield was created outside the town in October 1916 as a Station for 'B' Flight of No. 36 Squadron. It was originally known as Hylton, although when it was being prepared it was known as West Town Moor. Due to the increase in German bombing, the Royal Flying Corps undertook the task of Home Defence, setting up a number of squadrons, with flights spread over

the length of the British coastline. The north-east was protected by No. 36 Home Defence Squadron, which was formed by Capt. R O Abercromby at Cramlington in February 1916. No. 36 Home Defence Squadron defended the coast between Whitby and Newcastle. The main base was at Cramlington, to the north of Newcastle, with flights being attached to Seaton Carew and Ashington, as well as Hylton. By August 1918 Hylton was in use by 'A' Flight and continued as such until the Armistice, when it was just beginning to become known as Usworth.

3.2.19 Following the end of the First World War, Usworth airfield reverted to non-flying use, as was the case with many First World War aerodromes. Usworth languished unused for over a decade, apart from at least one visit by Alan Cobham's Flying Circus, until it was re-activated on March 17th 1930. From this period, the flying field was located to the south side of the road between Washington and Sunderland, and ancillary buildings were located to the north. The airfield was designed to accommodate one squadron of the recently expanded Royal Auxiliary Air Force, No. 607 (County of Durham) Squadron. North Camp was provided with living quarters and dining facilities for Officers, NCOs and airmen. It was initially proposed to erect canvas Besoneaux Hangars on the South Camp, however these were rejected in favour of the erection of a large Lamella Hangar. The South Camp also housed the Squadron Office, pilot huts, armoury, photographic hut and bombing training aids. The firing butts were alongside the railway. On 24th 1934, the airfield was opened to the public on Empire Air Day; this attracted 1300 visitors with an estimated 5000 other spectators watching the flying displays form outside the airfield. Proceeds from the Empire Air Day went to the RAF Benevolent Fund. The Empire Air Day in 1937, as well as having flying demonstrations and aerobatics, also included the erection of a dummy fort near the southern perimeter of the airfield, which was the subject of 'attacks' by the Hinds of 103 Squadron with the Demons of No. 607 Squadron 'defending'.

3.2.20 In September 1939 work commenced on the laying of two concrete runways, as well as the expansion of the airfield to the south, east and west by taking in adjoining fields. The new 2800 feet (c.900m) long runway was laid northwest to south-east, with another of similar length on a north-south heading. A new perimeter track was laid out along the airfield boundary with eight dispersal pens, each capable of holding a twin-engined aircraft. There were also 34 hard standings for single-engined fighters. Three of the older Callender Hangers were dismantled, leaving the Lamella and a single Callender hangar opposite the main gate. Additional buildings were constructed between the airfield and the road. An Operations Room was built near the Lamella hangar; this was later supplemented by an

underground Battle Headquarters near the Cow Stand Farm corner of the airfield. On the North Camp side new accommodation blocks were erected for the expected large influx of personnel which included WAAFs. On both sides of the road numerous air raid shelters were constructed. To assist in the defence of the airfield a series of dispersed sites were set up over a wide area around the site; these included a searchlight camp at the top of Ferryboat Lane and small gunposts on the Birtley Road, above the old quarries at the bottom end of Boldon Bank and along the disused railway line towards North Hylton. At Downhill Farm a large gun site was set up, and a decontamination centre was constructed well away from the airfield. During the Second World War, a watch tower was constructed on stilts on the roof of the Three Horse Shoes; the pub also acted as a Mess for Officers during this period.

3.2.21 In the publication *Archaeology of the Twentieth Century Defence Sites of Tyne and Wear: An Illustrated Guide*, several sites in and around the airfield at Usworth are listed. Of particular interest are the Pickett-Hamilton Forts, which were a form of pillbox unique to airfields, and which were often placed down the very centre of the runway. Pickett-Hamilton Forts were sunken, circular reinforced concrete pillboxes which remained flush with the airfields surface to permit the free movement of aircraft. If there was a threat of attack, however, the forts would be raised by a hand operated hydraulic jack and manned with guns.

3.2.22 Sunderland and its surrounding area did not escape bombing during the Second World War. The first bombs dropped on the district fell soon after midnight on the 22nd June 1940. Areas affected included buildings at the Old Rectory at Whitburn, a field near Church Lane and The Bents, and the Fishermen's Cottages, which narrowly escaped being demolished. An incendiary bomb fell onto Hylton Dene, 100 yards from Hylton Colliery, Castletown.

3.2.23 The airfield at Usworth had the distinction of being singled out for a major Luftwaffe attack during the Battle of Britain. On August 15th 1940, German aircraft were detected approaching the east coast of Britain. Spitfires from 72 Squadron Ackington met them off the Farne Islands, and although heavily outnumbered, several German aircraft were destroyed. The German formation then split in two, one portion making for Tyneside, while the other turned south. The Second Acklington Squadron, No. 79, encountered the northern group just off the coast and a wild dog-fight ensued. Reforming, the Hurricanes caught up with the bombers approaching Newcastle, where their primary objective would appear to have been Usworth. Harried by the Tyne guns and by more Hurricanes from Drem in

Scotland, the German 'Heinkels' made off, scattering their bombs with little effect, and leaving Usworth untouched.

3.2.24 For much of the Second World War, Usworth was used for training, with pilots of several nations stationed there, including Polish, Czech, Canadian, Australians, Americans and New Zealanders. The training of new pilots up to operational status was a hazardous activity with many aircraft damaged or destroyed during this period. Many of these pilots have their last resting place in Castletown cemetery near the airfield.

3.2.26 Following the end of the Second World War, Usworth was home to No. 31 Gliding School which had formed around 1944. The role of the Gliding School was to provide elementary flying training to cadets of the Air Training Corps from local squadrons in the north-east. In 1951 control of Usworth passed to No. 2 Basic Air Navigation School which disbanded in 1953 when control passed to Durham University Air Squadron. In 1958 the Gliding School, the University Air Squadron and the G.C.I aircraft were moved to RAF Ouston as Usworth was to close, although some limited use of the site was made by the Territorial Army for parachute training from tethered balloons. On 3rd July 1962, Usworth was bought by Sunderland Corporation for £27, 000 and reopened as Sunderland Airport.

3.2.27 Sunderland Corporation re-laid the runways and renovated the hangar, and in June 1963 Sunderland Flying Club came into being. On June 28th 1964 an Open Day and commemorative ceremony took place to celebrate the rebirth of what became Sunderland Airport. The Air Day in 1964 became an annual event with subsequent shows attracting greater participation. Sunderland Air Day in June 1981 attracted an estimated 50, 000 people to the airfield and surrounding hills. In the 1980s, 700 people a year made their first parachute jump at Sunderland Airport.

3.2.28 During the 1970s and 1980s, the collapse of manufacturing in the Sunderland area had a detrimental effect on employment. For example, over 34 000 jobs were lost between 1971 and 1981 alone. In the 1980s the economic outlook was bleak, although Sunderland enjoyed Development Area status and was eligible for maximum Urban Aid and EEC grants. The co-ordinated efforts of Sunderland Borough, Tyne and Wear Council, Washington Development Corporation and the government scored a major success in 1984 when they succeeded in attracting Nissan to build its new UK factory on Wearside. The massive Nissan plant was constructed on the 297 acre site of Sunderland (Usworth) Airport.

3.3 PREVIOUS WORK

3.3.1 In 2005, Archaeological Services University of Durham (ASUD) undertook an archaeological desk-based assessment and archaeological monitoring at Nissan Wind Farm (NZ 339 579, to the south of the Nissan factory). The desk-based assessment noted that although there was no direct evidence for prehistoric or Roman activity in the development area the presence of activity in the surrounding vicinity indicated that an as yet unidentified resource has the potential to exist. It was also noted that the use of the site as an airfield in the First and Second World Wars suggested that the site may have undergone significant landscaping to provide a level area for aircraft to land and take off.

3.3.2 An archaeological desk-based assessment was undertaken by On Site Archaeology Ltd (OSA) of land at Nissan Factory Business Park (located between the Nissan factory and the A1231 to the south), Washington, in July 2007 . The work concluded that there was the possibility that buried remains were present on the site, which could date from any period between the early Bronze Age and the present day. It was noted that the remains may survive as features cut into the natural subsoil and would possibly be visible immediately below the topsoil and B-horizon. The top of the archaeology was suggested to be located between 0.2m and 0.5m below the present ground surface.

3.3.3 A geophysical survey was undertaken by Met Surveys in April 2008 at Turbine Business Park, on land to the north of the A1231. The survey covered an area of approximately 20 hectares which at the time was rough pasture. The site had been in agricultural use for the past 20 years and although there were no known sites within the area, it was considered that there was the potential for buried archaeological remains to exist. The survey results revealed no features of archaeological significance, although modern services were noted to run across the site as evidence by manholes. The remains of ridge and furrow were detected in some parts of the site indicating the past agricultural use of the land, but their nature (narrow, closely spaced and straight) suggested they were of relatively modern origin.

3.3.4 Following on from the geophysical survey undertaken by Met Surveys, On Site Archaeology (OSA) conducted an archaeological evaluation on the land at Turbine Park in August 2008. Features such as the ridge and furrow and areas of disturbed ground, highlighted by the geophysical results, were targeted with the evaluation trenches. The work concluded that despite sites apparently rural appearance, it was clear that the site had been heavily re-worked during the 20th century. For example, the central, western and

northern parts of the site had been used to dispose unwanted waste material from building, which may have originated from the construction of the airfield, the test track or the nearby road. In all cases the method of dumping was the same; the topsoil was removed, the 'fill' material was dumped and then the topsoil was reinstated. The only feature potentially older than the 20th century was found in Trench 1 and consisted of a shallow linear feature containing small fragments of white-glazed pottery of 19th or 20th century date. Interestingly, the areas of ridge and furrow apparently revealed by the geophysical survey, and tested by Trenches 6, 8, 9 and 10, were not found. In the cases of Trenches 6 and 8 the presence of respectively c.0.70m thick and a 1.5m thick layer of dumped material would have prevented the detection of any preserved ridge and furrow.

3.3.5 In June 2009, North Pennines Archaeology Limited were commissioned by MDA Consulting Ltd to undertake an archaeological desk-based assessment of the current development area prior to the submission of a planning application for a sustainable manufacturing centre by Gateshead College. The desk-based assessment revealed that the proposed development area appears to have been undeveloped until the construction of the airfield at Usworth in 1916. The land appears to have been agricultural in character, despite industrial activity within close proximity (for example, the various railway branch lines, collieries and brick works). The assessment also demonstrated that Usworth Airfield started life in October 1916 as a Flight Station for 'B' Flight of 36 Squadron, and was initially known as Hylton or West Town Moor. By 1917, when it was used by 'A' Flight, it was starting to be known as Usworth. For most of its wartime career Usworth was a training station. Aerial photographs from 1934 show buildings at the airfield were located on the site of the proposed development area, with the main entrance situated in the approximate location of the present footpath. A map of 1945 shows the extent of the buildings on the site at that date; although these were mostly constructed of timber it is likely these structures sat on brick or concrete footings. An aerial photograph dating to 1941/1942 showed two cropmarks located to the west of the proposed development area; it is not known if these relate to the airfield or are totally unrelated, but they may suggest earlier activity in close proximity to the airfield site.

4 EVALUATION RESULTS

4.1 INTRODUCTION

4.1.1 The trenches were excavated down to the natural substrate where possible, followed by further hand excavation of potential archaeological features allowing an examination of any prospective archaeological remains. Trench locations are depicted in Figure 2.

4.1.2 Plans and sections of Trenches A, B and D can be found on Figure 3, and a plan and section of Trench C can be found on Figure 4.

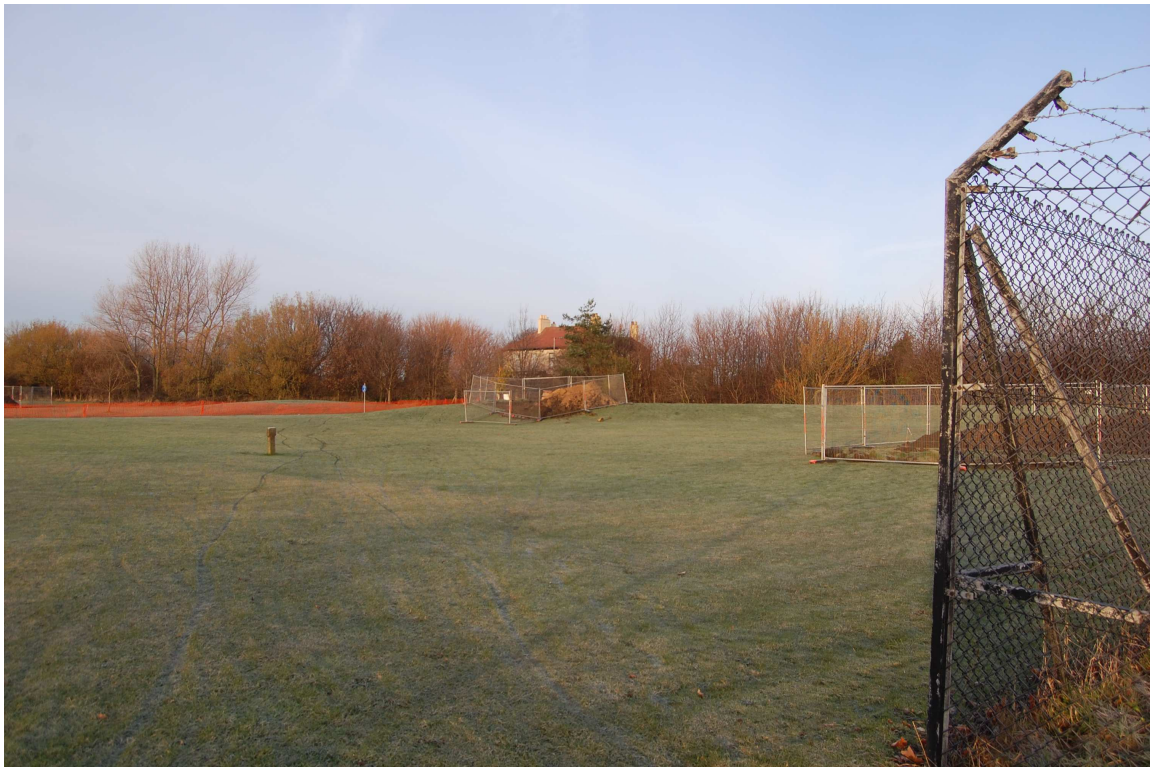

Plate 1. *The site looking northwest.*

4.2 TRENCH A

4.2.1 Trench A measured 10.00m in length and 1.60 in width, and was orientated roughly east-west.

4.2.2 The trench was located to evaluate the potential remains of the western and northern extensions of the Main Stores for the airbase, known to have been of timber construction.

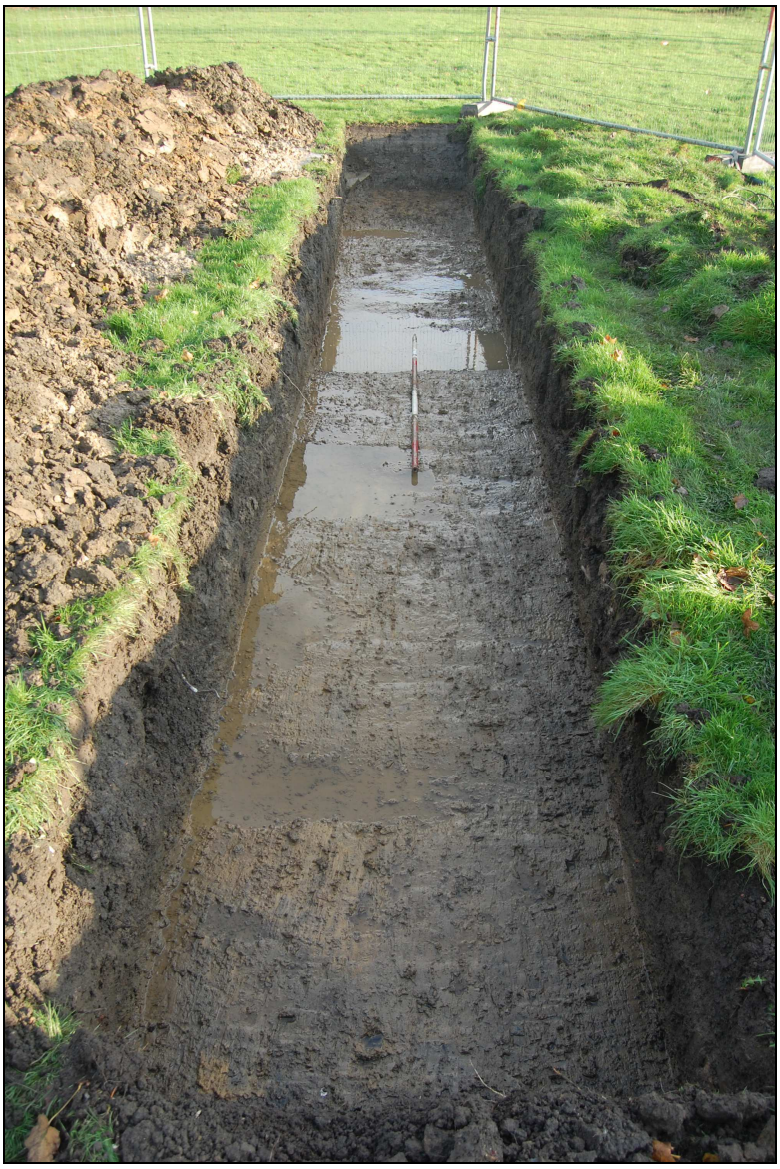

***Plate 2**. Trench A, looking east.*

4.2.3 The natural substrate, context (**102**), was found to be a compact orange/brown sandy clay averaging a depth of 0.68m below the current surface (and at an Ordnance Datum of 32.96m). Above the natural clay was a c.0.35m thick deposit of 20th century backfill, context (**104**), which was a compact mid-grey/brown silty clay with inclusions of small stones, concrete slivers and brick fragments. Above the backfill was a modern subsoil layer, context (**101**), which measured c.0.22m thick and was comprised of loose mid-brown sandy clay. Topsoil and turf, context (**100**), sealed the subsoil with an average depth of 0.14m.

4.2.4 In the north east corner of the trench the edge of a concrete drain, context (**108**), was uncovered aligned northwest-southeast, and sitting within the

modern backfill at 33.12mOD. This suggests that either the drain is not *in-situ*, or that the backfill context was laid at the same time as the drain, possibly as a packing 'foundation' layer for the building.

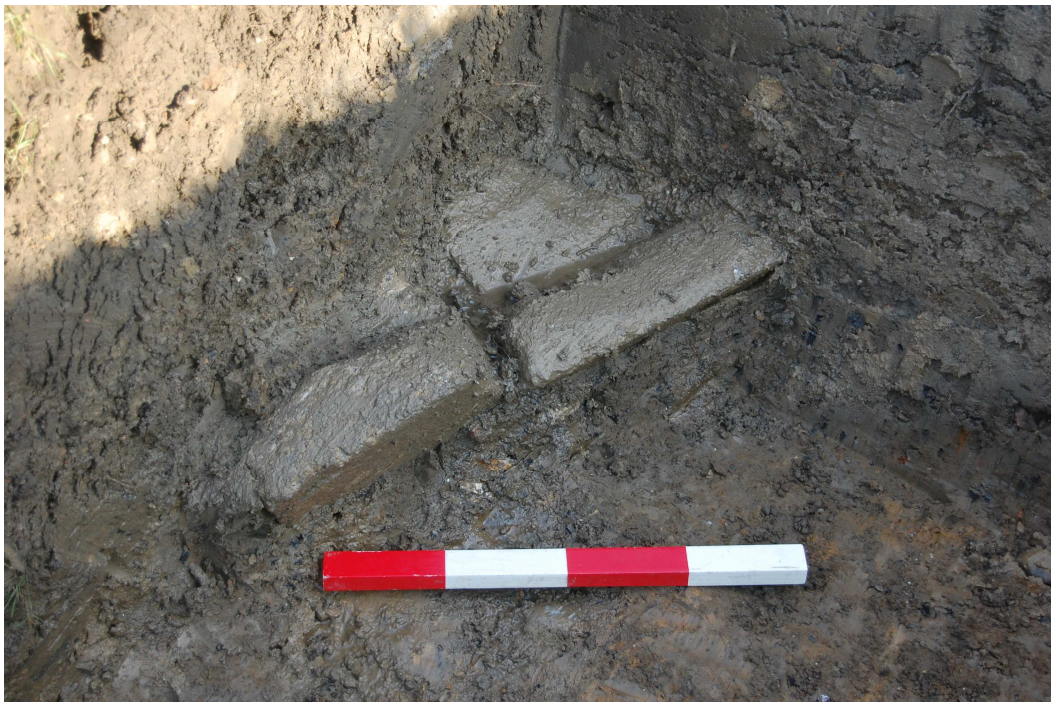

***Plate 3**. Drain (**108**) looking north-east.*

4.2.5 Fragments of late 20th century pottery and glass were recovered from context (**104**), with the other strata remaining artefactually sterile. No deposits were deemed suitable for environmental sampling.

4.3 TRENCH B

4.3.1 Trench B measured 5.0m in length and 3.0m in width, and was orientated roughly east-west .

4.3.2 The trench was located to evaluate the potential remains of the eastern extension of the Main Stores for the airbase, known to have been of timber construction.

4.3.3 The natural substrate, context (**102**), averaged a depth of 0.89m below the current surface (Ordnance Datum of 32.54m). Over the natural clay was a c.0.45m thick deposit of context (**104**), comprising 20th century backfill, above which was the modern subsoil layer, context (**101**), which measured c.0.22m

Topsoil and turf, context (**100**), sealed the subsoil with an average depth of 0.22m.

4.3.4 In the western extent of the trench was the remains of a concrete wall footing (**106**), aligned roughly northwest-southeast (Plate 5). The footing of the wall lay at 32.85m OD, measured 0.47m in width and spanned the width of the trench. The concrete lay on a thin deposit of context (**107**), a black ash and grit deposit which made up the lowest foundation strata of the wall remains.

4.3.5 Fragments of 20th century pottery and glass were recovered from context (**104**), with the other strata remaining sterile of artefacts. No deposits were deemed viable for environmental sampling.

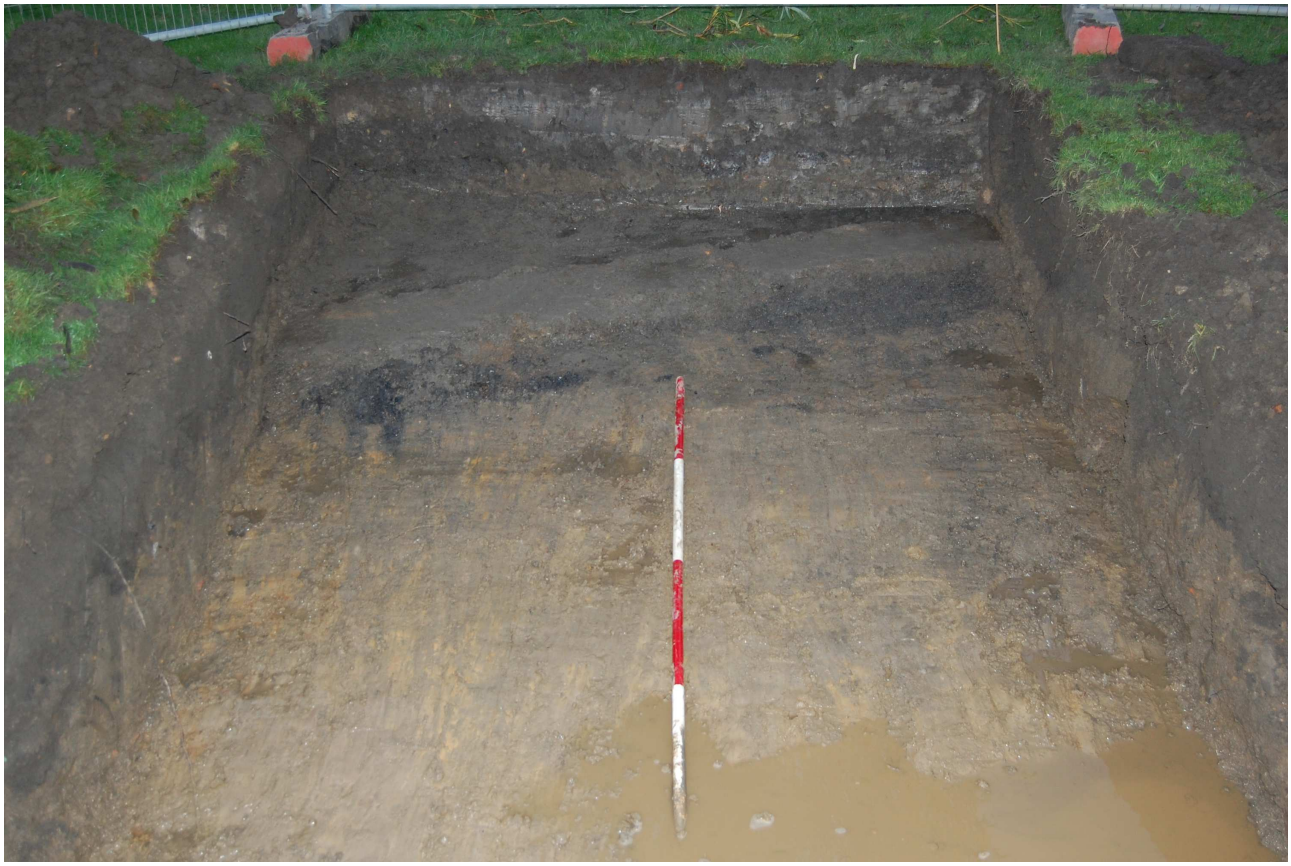

Plate 4. *Trench B, looking west.*

***Plate 5**. Wall footing (106), looking north.*

4.4 TRENCH C

4.4.1 Trench C measured 5.0m in length and 3.0m in width, and was orientated roughly north-south on the crest of a bund bordering the north side of the plot of land to the east of the dividing public path.

4.4.2 The trench was located to evaluate the potential remains of the Motor Transport Sheds and Office for the airbase, known to have been of timber construction.

4.3.3 In this trench, the natural substrate was not revealed due to the trench depth exceeding the reach of the mechanical excavator's bucket due to the trench's position on the bund. The depth excavated reached a vertical 2.02m, with the 20th century backfill layer, context (**104**), revealed 1.70m below the current surface. Over this layer was a 1.06m thick deposit of pale yellow crushed

hardcore, context (**103**), which formed the core of the bund's structure. Above the hardcore was a 0.27m thick deposit of modern subsoil, context (**101**), sealed by a 0.37m deposit of topsoil and turf, context (**100**).

4.3.4 Due to the highly unstable nature of the hardcore, the trench was stepped inwards and the deepest section of the excavation was not entered for recording purposes on Health and Safety grounds.

4.3.5 No artefactual or structural remains were recovered from this trench, and no deposits were deemed suitable for environmental sampling.

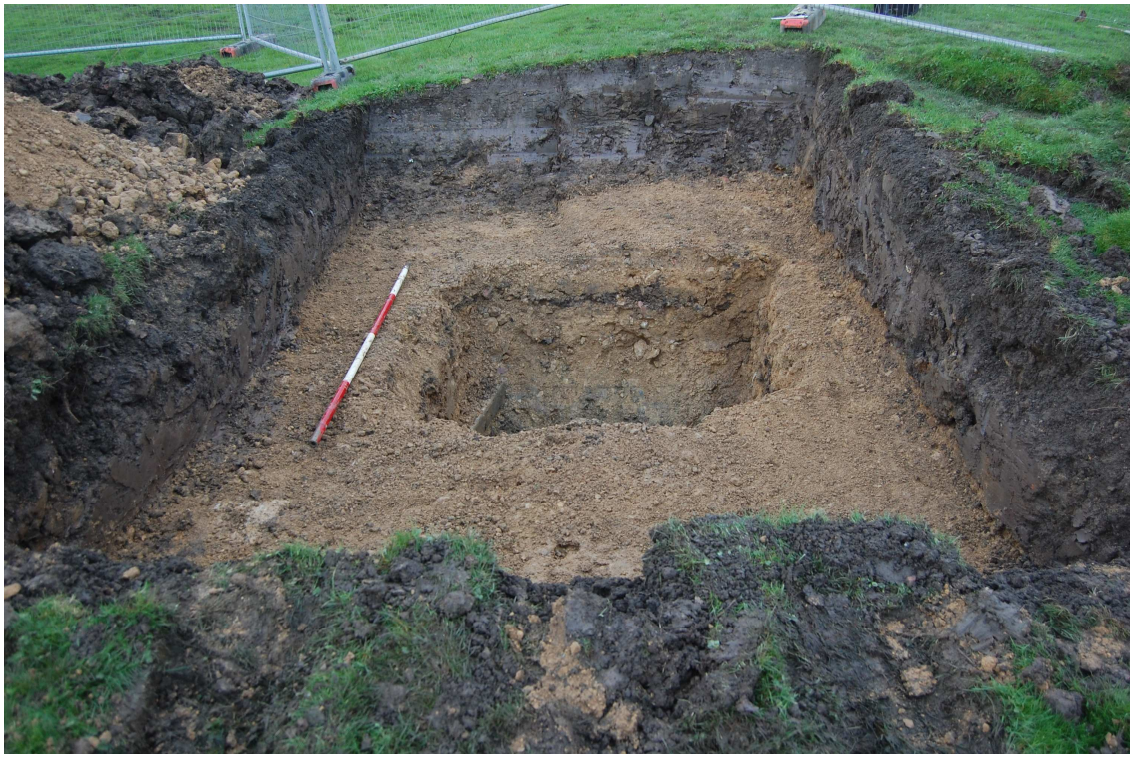

***Plate 6**. Trench C, looking south.*

4.5 TRENCH D

4.5.1 Trench D measured 5.0m in length and 3.0m in width, and was orientated roughly east-west in the eastern extent of the development area.

4.5.2 The trench was located to evaluate the potential remains of the main Workshops for the airbase, known to have been of timber construction.

4.3.3 The natural substrate, context (**102**), was found at a depth of c.0.75m below the current surface (and at an Ordnance Datum of 32.99m). Above the natural clay was a c.0.37m thick deposit of 20th century backfill, context (**104**). Above the backfill was a thin 0.06m thick deposit of pale yellow crushed hardcore, context (**103**), sealed by a c.0.17m thick layer of modern subsoil, context (**101**). As with the previous three trenches, Trench D was

sealed by topsoil and turf, context (**100**), measuring an average thickness of 0.11m.

4.3.4 At the south-western extent of the trench a concrete block, context (**105**), was found embedded in the natural clay. This block measured 0.64m in length, 0.31m in width and had a visible depth of 0.19m. The block was highly degraded, and although it could perhaps have been the remains of a concrete plinth or footing, it is more likely that it is a disturbed block pushed into the natural clay during the leveling of the site.

4.3.5 Fragments of early 20th century pottery were recovered from context (**104**), with the other strata remaining artefactually sterile. No deposits were deemed viable for environmental sampling.

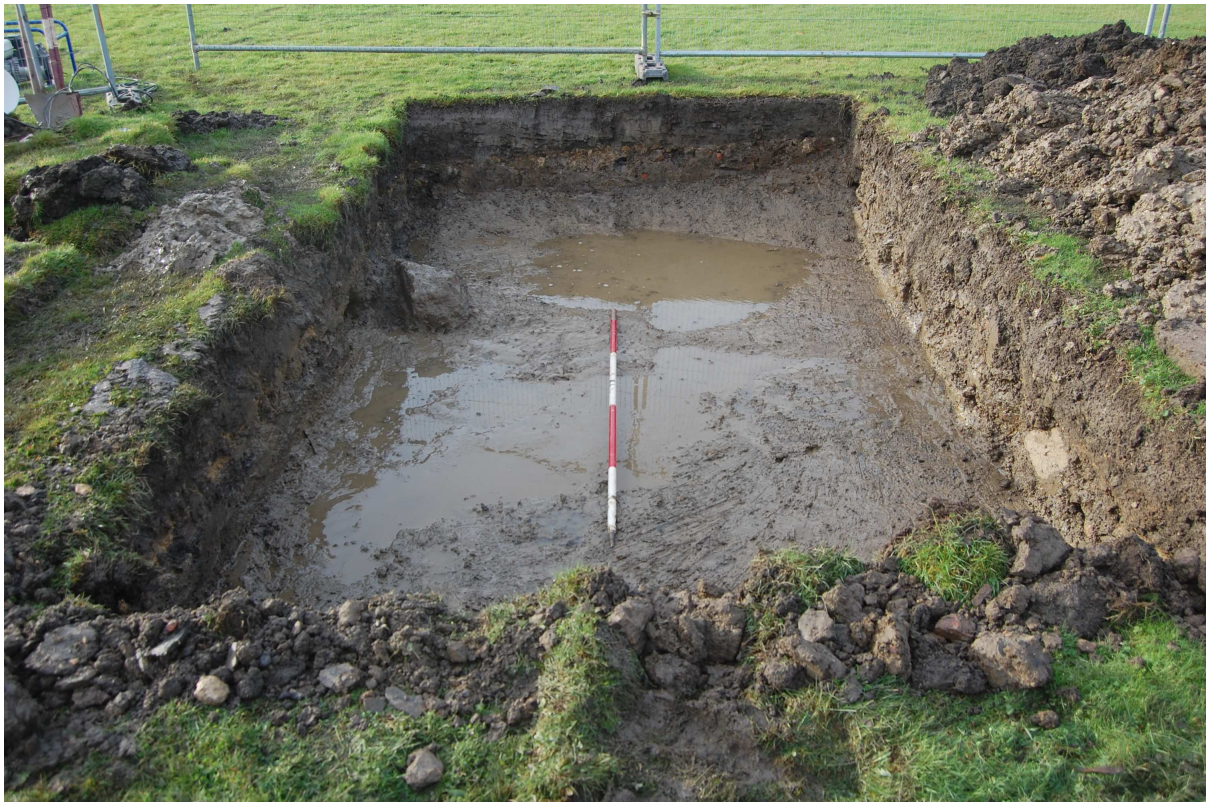

Plate 7. *Trench D, looking west.*

5 CONCLUSIONS AND RECOMMENDATIONS

5.1 CONCLUSIONS

5.1.1 The trenching revealed a relatively uniform stratigraphy, with natural clay underlying all trenches (this is assumed for Trench C) at an average height of 32.83mOD.

5.1.2 All trenches contained a modern 20th century deposit overlying the natural substrate, the top of which averaged a datum height of 33.14mOD. This deposit indicates the level taken during the clearance of the site with any remains of the airfield buildings removed to this depth or below. This deposit also represents the depth of overburden stripped to during the building of the Nissan Works, when the development site was used as a storage and work area: this is demonstrated by the modern crushed hardcore observed in both Trenches C and D. Trench C also showed the use of hardcore to create the landscaped bunds in the northern extent of the site, indicating that the bunds are simply landscape features rather than the remains of airfield buildings.

5.1.3 In Trench A, a concrete drain was uncovered in the northeast corner of the trench set within the modern backfill. While this could be a remnant of the drainage system from the airfield, it is more likely to be part of a drainage system set up while the area was used as a working compound for the construction of the Nissan Works.

5.1.4 Trench B revealed a highly truncated concrete wall footing, which bears no relation to the potential remains of the Main Stores which the trench was targeting. However, the alignment does match with the edge of the road to the east of the building, perhaps indicating that the lowest remains of the road edging still remain *in-situ*.

5.1.5 Overall, the trenching revealed that no timber remains of the buildings targeted remain in the evaluation area, with concrete footing remains minimal at best, with the majority removed during the 1980s when the area was used as a compound during the construction of the Nissan Works to the south.

5.2 RECOMMENDATIONS

5.2.1 The potential for archaeological remains within the development area remains low. Given the lack of any significant archaeological features during the evaluation it is recommended that no further work takes place.

6 BIBLIOGRAPHY

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APPENDIX 1: CONTEXT TABLE

Context	Context Type	Description
(100)	Deposit	Modern topsoil and turf.
(101)	Deposit	Modern subsoil.
(102)	Natural Substrate	Yellow-brown compact sandy clay.
(103)	Deposit	Crushed hardcore in Trenches C and D.
(104)	Deposit	Modern backfill.
(105)	Deposit	Concrete block embedded in natural clay in Trench D.
(106)	Deposit	Concrete wall footing in Trench B.
(107)	Deposit	Packing material for wall footing (106).
(108)	Deposit	Concrete drain in Trench A.

***Table 1**. List of Contexts issued during the Evaluation*

APPENDIX 2: BRIEF

Tyne and Wear Specialist Conservation Team

Specification for Preliminary Archaeological Evaluation at Land off access road to A1290, Nissan, Washington Road, Usworth

Planning Application: 09/02486/FUL

Author:

Jennifer Morrison

Tyne and Wear Archaeology Officer

West Chapel

Jesmond Old Cemetery

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Newcastle upon Tyne

NE2 1NL

Tel (0191) 2816117

jennifer.morrison@newcastle.gov.uk

Date: 3 September 2009

County Archaeologist's Reference Number: MON7453

The Tyne and Wear Specialist Conservation Team is the curatorial service for archaeology, industrial archaeology and historic buildings throughout the Tyne and Wear districts. It helps and advises Newcastle, Gateshead, North Tyneside, South Tyneside and Sunderland Councils to carry out their statutory duties to care for the precious historic environment of Tyneside and Wearside. The Team can be found at the Strategic Housing, Planning and Transportation Division of the Environment & Regeneration Directorate of Newcastle City Council.

Introduction

Site grid reference: NZ 340 588

Planning permission has been granted for a two storey office and teaching facility comprising of classrooms, lecture theatre, café, offices and learning resource centre. Attached to this will be a steel portal framed training facility for motor manufacturing and productivity. An

archaeological desk based assessment has been produced (North Pennines Archaeology Ltd, June 2009). The appointed archaeologist must familiarise themselves with the results of this previous archaeological work on the site before starting work.

The report concludes that the site was undeveloped until the construction of the airfield in 1916. Hylton or West Moor Airfield was a Flight Station for 'B' Flight of 36 Squadron. By 1917 it was used by 'A' Flight and was also known as Usworth. There were buildings associated with the airfield within the development site in 1934. They were probably timber buildings on brick or concrete footings. Buildings were present throughout World War Two and into the 1950s. A plan of 1945 identifies some of the buildings within the site as a fire tender garage, MT sheds, station offices and workshops.

The eastern part of the site has been landscaped. The western side is grassed with trees and also landscaped. In accordance with PPG16 and UDP Policy B14 a programme of archaeological evaluation is required to ascertain if any trace of these buildings survives.

Research Aims and Objectives

The evaluation report should make reference to Regional and Thematic Research Frameworks. The North-East Regional Research Framework for the Historic Environment (2006) notes the importance of research as a vital element of development-led archaeological work. It sets out key research priorities for all periods of the past allowing commercial contractors to demonstrate how their fieldwork relates to wider regional and national priorities for the study of archaeology and the historic environment. The aim of NERRF is to ensure that all fieldwork is carried out in a secure research context and that commercial contractors ensure that their investigations ask the right questions.

See http://www.algao.org.uk/Association/England/Regions/ResFwks.htm

Ideally and where possible the evaluation should cross-reference its aims and objectives to national priorities, defined in SHAPE (Strategic Frameworks for Historic Environment Activities and Programmes in English Heritage), and the English Heritage Research Agenda 2005-2010.

Where appropriate note any similar nationwide projects using ADS, internet search engines, ALSF website, HEEP website, OASIS, NMR excavation index. All staff on site must understand the project aims and methodologies.

Methods statement

Four evaluation trenches are needed to inform the Planning Authority of the character, nature, date, depth, degree of survival of archaeological deposits on this site. The excavation must be carried out by a suitably qualified and experienced archaeological organisation. The work will record and environmentally sample any

archaeological deposits of importance found on the plot. The purpose of this brief is to obtain tenders for this work. The report must be the definitive record for deposition in the Tyne and Wear HER, and it must contain recommendations for any further archaeological work needed on this site. The commissioning client needs to be aware that the purpose of the preliminary

evaluation is merely to ascertain if archaeological remains survive on this site and if they do, to determine their broad date, nature and function. Where archaeological remains are found in the preliminary trenches, and if these remains are at threat by the proposed development, further archaeological excavation and or a watching brief will be required before and during development work.

All staff employed by the Archaeological Contractor shall be professional field archaeologists with appropriate skills and experience to undertake work to the highest professional standards. The work will be undertaken according to English Heritage Guidelines – Managing Archaeological Projects 2nd Edition ('MAP2') 1991 (www.englishh.gov.uk/ guidance/ map2/ index.htm) and Management of Research Projects in the Historic Environment (MoRPHE) – The MoRPHE Project Managers' Guide, Project Planning Notes and Technical Guides 2006 (www.englishheritage.org.uk/publications).

The work will be undertaken according to MoRPHE Project Planning Notes 2006 - PPN3 – Archaeological Excavation and PPN6 – Development of Procedural standards and guidelines for the historic environment.

All work must be carried out in compliance with the codes of practice of the Institute of Field Archaeologists and must follow the IFA Standard and Guidance for Archaeological Field Evaluations, Excavation or Watching Briefs as appropriate. www.archaeologists.net

Notification

The County Archaeologist needs to know when archaeological fieldwork is taking place in Tyne and Wear so that he can inform the local planning authority and can visit the site to monitor the work in progress. The Archaeological Contractor must therefore inform the County Archaeologist of the start and end dates of the Evaluation. He must also keep the County Archaeologist informed as to progress on the site. The CA must be informed of the degree of archaeological survival and of any significant finds. The Client will give the County Archaeologist reasonable access to the development to undertake monitoring.

PROJECT INITIATION

PROJECT DESIGN

Because this is a detailed specification, the County Archaeologist does not require a Project Design from the appointed archaeologist. However a health and safety statement and risk assessment, identifying potential risks in a risk log (see template in appendix 2 of The MoRPHE Project Manager's Guide) and specifying suitable countermeasures and contingencies, is required to be submitted to the commissioning client.

The Management of Research Projects in the Historic Environment (MoRPHE) – The MoRPHE Project Managers' Guide 2006 contains general guidance on Risk management (section 2.3.2, Appendix 2).

Risk assessments must be produced in line with legislative requirements (for example the Health and Safety at Work Act 1974, the Management of Health and Safety at Work Regulations 1999, the Control of Substances Hazardous to Health (COSHH) Regulations 2002

and the Personal Protective Equipment at Work Regulations 2002) and best practice e.g. as set out in the SCAUM (Standing Conference on Archaeological Unit Managers) Health and Safety Manual http://www.scaum.org/uk

Detailed information on hazards and how to carry out a risk assessment can be obtained from the Health and Safety Executive (www.hse.gov.uk) and the local authority health and safety department.

Specific guidance for land contamination and archaeology can be obtained from the Institute for Archaeologists (www.archaeologists.net), the Construction Industry Research and Information Association (www.contaminated-land.org) and the Association of Geotechnical and Geoenvironmental Specialists (www.ags.org.uk). See also Environment Agency, 2005 "Guidance on Assessing the Risk Posed by Land Contamination and its Remediation on Archaeological Resource Management".

The Archaeological Contractor must be able to provide written proof that the necessary levels of Insurance Cover are in place. The Archaeological Contractor must detail measures taken to ensure the safe conduct of excavations, and must consult with the client's structural engineers concerning working in close proximity to the foundations of the surrounding buildings. The Client may wish to see copies of the Archaeological Contractor's Health and Safety Policies.

The Archaeological Contractor must maintain a Site Diary for the benefit of the Client, detailing the nature of work undertaken on a day by day basis, with full details of Site Staff present, duration of time on site, etc. and contact with third parties.

PROJECT EXECUTION

1) Archaeological evaluation

The appointed archaeological contractor will decide where best to put the trenches to avoid the most obviously landscaped parts of the site. The dimensions of the four trenches are each 1.5m x 20m in plan at base. The trenches will be located on the sites of former buildings as shown on the plan of 1945 (figure 10 in the desk based assessment).

A trench location plan will be sent to the Archaeology Officer for approval before starting work. Trench locations can be adjusted to avoid services or for practical or safety purposes. Trenches can be widened if feasible in order to step the sides to reach depths over 1.2m where necessary, otherwise shoring will be required. Trenches must avoid known services.

Trenches must stay a safe distance away from pylons and overhead power lines. The commissioning client will advise of any ecological or biodiversity issues which need to be taken into consideration. The commissioning client will advise of any protected trees which must be avoided by the evaluation. Damage to trees covered by a Tree Protection Order carries a substantial fine.

Trench positions should be accurately surveyed prior to excavation and tied in to the national grid. The trenches should be excavated to the depth natural subsoil if this can be reached safely.

Tasks

Hand excavation, recording and environmental sampling (as stipulated below) of deposits down to the depth specified above. Any modern overburden or levelling material can be machined-off using a wide toothless ditching bucket under strict archaeological supervision and the remaining deposits are to be excavated by hand. All faces of the trench that require examination or recording will be cleaned.

Excavation is to be carried out with a view to avoid damage to any archaeological features which appear to worthy of preservation in-situ. Excavation is to be carried out by single context planning and recorded on *pro-forma* context sheets. Features over 0.5 m in diameter can be half sectioned.

Environmental sampling (and where relevant scientific dating) are compulsory parts of the evaluation exercise. All tenders will give a price for the assessment, full analysis, report production and publication per environmental and scientific dating sample as a contingency.

Samples will be taken of bricks from any brick-built structures. The dimensions of the bricks and the type of bonding must be recorded. Scientific investigations should be undertaken in a manner consistent with "The Management of Archaeological Projects", English Heritage 1991 and with "Archaeological Science at PPG16 Interventions: Best Practice for Curators and Commissioning Archaeologists", English Heritage, 2003. Advice on the sampling strategy for environmental samples and samples for scientific dating etc. must be sought from Jacqui Huntley, English Heritage Regional Advisor for Archaeological Science (jacqui.huntley@english-heritage.org.uk or 07713 400387) before the evaluation begins. See Appendix 1 for more information.

See Appendix 2 for guidance on procedures relating to human remains.

See Appendix 4 for guidance on Treasure Act procedures.

The spoil can be kept close-by and rapidly backfilled into the trenches at the conclusion of this work.

Recording

A full written, drawn (accurate scale plans, elevations and section drawings) and photographic record (of all contexts in black and white print and colour transparency with clearly visible graduated metric scale) will be made. The finished report must include a plan and section of each trench (even where no archaeological remains are recorded) plus plans and sections through excavated archaeological features.

The plans will include at least two site grid points and will show section line end points.

The plans will depict building material (i.e. brick and stone) where a complex of structures has been found.

Where there is a complex of interlocking multi-phased structures, a phasing plan will also be included.

There will be elevation drawings of any standing structures such as walls.

Pro-forma context sheets will be used.

All deposits and the base of the trench will be levelled. Levels will be expressed as metres above Ordnance Datum.

Stratigraphy shall be recorded even when no archaeological features have been recognised.

A 'Harris' matrix will be compiled where stratified deposits are recorded.

2) Post-excavation and report production

Finds Processing and Storage

The Archaeological Contractor will process and catalogue the finds in accordance with Museum and Galleries Commissions Guidelines (1992) and the UKIC Conservation Guidelines, and arrange for the long term disposal of the objects on behalf of the Client. A catalogue of finds and a record of discard policies, will be lodged with the finds for ease of curation. Finds shall be recorded and processed in accordance with the IFA Guidelines for

Finds Work

Finds will be assessed by an experienced finds specialist. Human and animal bone assemblages should be assessed by a recognised specialist (see Appendices 2 and 3 for more information). Industrial slag and metal working debris will be assessed by a specialist. Assessment should include x-radiography of all iron objects (after initial screening to exclude recent debris) and a selection of non-ferrous artefacts (including all coins). Refer to "Guidelines on the x-radiography of archaeological metalwork, English Heritage, 2006.

Brick dimensions will be measured and a note made of the bonding material. If necessary, pottery sherds and bricks should be recommended for Thermoluminescence dating.

Finds processing, storage and conservation methods must be broadly in line with current practice, as exemplified by the IFA "Standard and guidance for the collection, documentation, conservation and research of archaeological materials", 2001. Finds should be appropriately packaged and stored under optimum conditions, as detailed in the RESCUE/UKIC publication "First Aid for Finds"

(Watkinson and Neal 1998). Proposals for ultimate storage of finds should follow the UKIC publication "Guidelines for the Preparation of Excavation Archives for Long-term Storage" (Walker 1990). Details of methodologies may be requested from the Archaeological Contractor.

Other useful guidance – "A Strategy for the Care and Investigation of Finds",

English Heritage, 2003, "Finds and Conservation Training Package", English Heritage, 2003.

All objects must be stored in appropriate materials and conditions to ensure minimal deterioration. Advice can be sought from Jacqui Huntley of English Heritage (07713 400387) where necessary.

PRODUCTS

The report

1. The Archaeological Contractor must produce an interim report of 200 words minimum, two weeks after the completion of the field-work, for the Client and the Planning Authority, with a copy for information to the County Archaeologist. This will contain the recommendations for any further work needed on site.

2. The production of Site Archives and Finds Analysis will be undertaken according to English Heritage Guidelines - Managing Archaeological Projects 2nd Edition ('MAP2') 1991 and Management of Research Projects in the Historic Environment (MoRPHE) 2006.

3. A full archive report or post-excavation assessment, with the following features should be produced within six months of the completion of the fieldwork. All drawn work should be to publication standard. The report must include:

* Location plans of trenches and grid reference of site

* Site narrative – interpretative, structural and stratigraphic history of the site

* Plans showing major features and deposit spreads, by phase, and section locations

* Sections of the two main trench axes and through excavated features with levels

* Elevation drawings of any walls etc. revealed during the excavation

* Artefact reports – full text, descriptions and illustrations of finds

* Tables and matrices summarising feature and artefact sequences.

* Archive descriptions of contexts, grouped by phase (not for publication)

* Deposit sequence summary (for publication/deposition)

* Colour photographs of trenches and of archaeological features and finds

* Laboratory reports and summaries of dating and environmental data, with collection methodology.

* A consideration of the results of the field-work within the wider research context (ref. NERRF).

* Recommendations for further work on site, or further analysis of finds or environmental samples

* Copy of this specification

4. Three bound and collated copies of the report need to be submitted:

• one for the commissioning client

• one for the planning authority (Sunderland City Council) – this must be formally submitted by the developer to the planning department with the appropriate fee.

• one for deposition in the County HER at the address below. A digital copy of the report on CD is also required by the HER in a plastic case. Please do not attach this to the report. The report and CD for the HER must be sent by the archaeological consultant or their client directly to the address below. If the report is sent via the planning department, every page of the report will be stamped with the planning application number which ruins the illustrations. The HER is also often sent a photocopy instead of a bound colour original which is unacceptable.

Publication

If significant archaeological features are found during the evaluation, the results may also warrant publication in a suitable archaeological journal. The tender should therefore include an estimated figure for the production of a short report of, for example 20 pages, in a journal such as Archaeologia Aeliana, the Arbeia Journal, Industrial Archaeology Review or Durham Archaeological Journal. This is merely to give the commissioning client an indication of potential costs. Before preparing a paper for publication, the archaeological contractor must discuss the scope, length and suitable journal with the County Archaeologist.

Archive Preparation and Dissemination

The archive should be a record of every aspect of an archaeological project – the aims and methods, information and objects collected, results of analysis, research, interpretation and publication. It must be as complete as possible, including all relevant documents, records, data and objects {Brown, 2007, 1}.

The site archive (records and materials recovered) should be prepared in accordance with Managing Archaeological Projects, Second Edition, 5.4 and appendix 3 (HBMC 1991), MoRPHE Project Planning Notes 2006 PPN3 – Archaeological Excavation, "Archaeological documentary archives" IFA Paper No. 1, "Archaeological Archives – creation, preparation, transfer and curation"Archaeological Archives Forum etc., Guidelines for the Preparation of Excavation Archives for Long Term Storage (UKIC 1990) and "Archaeological Archives – A guide to best practice in creation, compilation, transfer and curation" by Duncan H. Brown, Archaeological Archives Forum, July 2007.

Documentary Archive

The documentary archive comprises all records made during the archaeological project, including those in hard copy and digital form. This should include written records, indexing, ordering, quantification and checking for consistency of all original context sheets, object records, bulk find records, sample records, skeleton records, photographic records (including negatives, prints, transparencies and x-radiographs), drawing records, drawings, level books, site note-books, spot-dating records and conservation records, publication drafts, published work, publication drawings and photographs etc.

A summary account of the context record, prepared by the supervising archaeologist, should be included. All paper-based material must at all times be stored in conditions that minimise the risk of damage, deterioration, loss or theft. Do not fold documents. Do not use self-adhesive labels or adhesive or tape of any kind. High quality paper (low-acid) and permanent writing materials must be used.

Original drawings on film must be made with a hard pencil, at least 4H. Do not ink over original pencil drawings. Use polyester based film for drawings (lasts longer than plastic).

Store documents in acid-free, dust-proof cardboard boxes. Store documents flat. All documents must be marked with the project identifier (e.g. site code) and/or the museum accession number. All types of record must use a consistent terminology and format.

Use non-metal fastenings, and packaging and binding materials that ensure the longevity of documents. Copies of reports and appropriate drafts, with associated illustrative material, must be submitted for inclusion with the archive.

Material Archive

The material archive comprises all objects (artefacts, building materials or environmental remains) and associated samples of contextual materials or objects. All artefacts and ecofacts retained from the site must be packed in appropriate materials. All finds must be cleaned as appropriate to ensure their long-term survival.

All metal objects retained with the archive must be recorded by x-radiograph (except gold or lead alloys or lead alloys with a high lead content and objects too thick to be x-rayed effectively e.t.c.)

All finds must be marked or labelled with the project and context identifiers and where relevant the small-finds number. Use tie-on rot-proof labels where necessary. Bulk finds of the same material type, from the same context, may be packed together in stable paper or polythene bags. Mark all bags on the outside with site and context identifiers and the material type and include a polyethylene label marked with the same information.

Use permanent ink on bags and labels. Sensitive finds must be supported, where appropriate, on inert plastic foam or acid-free tissue paper. It is not advisable to wrap objects in tissue as the unwrapping could cause damage.

The archive will be placed in a suitable form in the appropriate museum (typically the Museum of Antiquities for Newcastle (stores in Bedson Building and at Team Valley) and Tyne and Wear Museums for the rest of Tyne and Wear (check with these institutions) with the landowner's permission. Contact Andrew Parkin at the Museum of Antiquities (0191 2228996) and Alex Croom at Tyne and Wear Museums (0191 4544093).

A letter will be sent to the County Archaeology Officer within six months of the report having been submitted, confirming where the archive has been deposited.

Digital Archive

See MoRPHE Technical Guide 1 – Digital Archiving & Digital Dissemination 2006.

SIGNPOSTING

OASIS

The Tyne and Wear County Archaeologist supports the Online Access to the Index of Archaeological Investigations (OASIS) project. This project aims to provide an online index/access to the large and growing body of archaeological grey literature, created as a result of developer-funded fieldwork.

The archaeological contractor is therefore required to register with OASIS and to complete the online OASIS form for their evaluation at http://www.oasis.ac.uk/.

Please ensure that tenders for this work takes into account the time needed to complete the form.

Once the OASIS record has been completed and signed off by the HER and NMR the information will be incorporated into the English Heritage Excavation Index, hosted online by the Archaeology Data Service.

The ultimate aim of OASIS is for an online virtual library of grey literature to be built up, linked to the index. The unit therefore has the option of uploading their grey literature report as part of their OASIS record, as a Microsoft Word document, rich text format, pdf or html format. The grey literature report will only be mounted by the ADS if both the unit and the HER give their agreement. The grey literature report will be made available through a library catalogue facility.

Please ensure that you and your client understand this procedure. If you choose to upload your grey literature report please ensure that your client agrees to this in writing to the HER at the address below.

For general enquiries about the OASIS project aims and the use of the form please contact: Mark Barratt at the National Monuments Record (tel. 01793 414600 or oasis@english-heritage.org.uk). For enquiries of a technical nature please contact: Catherine Hardman at the Archaeology Data Service (tel. 01904 433954 or oasis@ads.ahds.ac.uk). Or contact the Tyne and Wear Archaeology Officer at the address below.

The tender

Tenders for the work should contain the following:-

1. Brief details of the staff employed and their relevant experience

2. Details of any sub-contractors employed

3. A quotation of cost, broken down into the following categories:-

* Costs for the excavation, incl. sub-headings of staff costs on a person-day basis, transport, materials, and plant etc.

* Post-excavation costs, incl. storage materials

* Cost of Environmental analysis and scientific dating per sample

* Estimated cost for full publication of results in an archaeological journal

* Overheads

4. An indication of the required notification period (from agreement to start date) for the field-work; the duration of fieldwork and the expected date for completion of the post-excavation work (a maximum of 6 months after completion of the fieldwork)

Monitoring

The Archaeological Contractor will inform the County Archaeologist of the start and end dates of the excavation to enable the CA to monitor the work in progress. Should important archaeological deposits

be encountered, the County Archaeologist must be informed. If further archaeological evaluation is required on this site, then the archaeological contractor must submit a written scheme of investigation for approval by the CA before extending the size of the trenches.

APPENDICES

1 Environmental Sampling, Scientific Analysis and Scientific Dating

This is a compulsory part of the evaluation exercise. Scientific investigations should be undertaken in a manner consistent with "The Management of Archaeological Projects", English Heritage 1991 and with "Archaeological Science at PPG16 Interventions: Best Practice for Curators and Commissioning Archaeologists", English Heritage, 2003.

Aims of environmental sampling – to determine the abundance/concentration of the material within the features and how well the material is preserved, to characterise the resource (the site) and each phase, to determine the significance of the material and its group value, what crop processing activities took place on the site? What does this tell us about the nature of the site? Is there any evidence for changes in the farming practice through time? How did people use this landscape? Can we place certain activities at certain locations within the site?

Function and date of individual features such as pits, hearths etc. Are the charred assemblages the result of ritual deposition or rubbish? Is the charcoal the result of domestic or industrial fuel?

Advice on the sampling strategy for environmental samples and samples for scientific dating etc. must be sought from Jacqui Huntley, English Heritage Regional Advisor for Archaeological Science (07713 400387) before the evaluation begins. The sampling strategy should include a reasoned justification for selection of deposits for sampling.

Deposits should be sampled for retrieval and assessment of the preservation conditions and potential for analysis of biological remains (English Heritage 2002). Flotation samples and samples taken for coarse-mesh sieving from dry deposits should be processed at the time of fieldwork wherever possible. Sieving recovers fish, amphibian, small bird and mammal bone, small parts of adult mammals and young infused bones which may be under-represented otherwise. However it is noted that clay soils in this region make sieving difficult. Discuss the potential for sieving with Regional Advisor for Archaeological Science.

Environmental samples (bulk soil samples of 30-40 litres volume) will be collected by the excavator from suitable (i.e. uncontaminated) deposits. It is suggested that a large number of samples be collected during evaluation from which a selection of the most suitable (uncontaminated) can be processed. All tenders will give a price for the assessment, full analysis, report production and publication per sample. The full 30-40 litre sample must be assessed by the laboratory, not just a small sub-sample.

Deposits will be assessed for their potential for radiocarbon, archaeomagnetic (guidance is available in the Centre for Archaeology Guideline on Archaeometallurgy 2001) and Optically Stimulated Luminescence dating. Timbers will be assessed for their potential for dendrochronology dating. Sampling should follow procedures in "Dendrochronology: guidelines on producing and interpreting dendrochronological dates", Hillam, 1998. All tenders will quote the price of these techniques per sample.

The following information should be provided with the environmental samples to be processed – brief account of nature and history of the site, aims and objectives of the project, summary of archaeological results, context types and stratigraphic relationships, phase and dating information, sampling and processing methods, sample locations, preservation conditions, residuality/contamination etc.

Laboratory processing of samples shall only be undertaken if deposits are found to be reasonably well dated, or linked to recognisable features and from contexts the derivation of which can be understood with a degree of confidence.

A range of features, and all phases of activity, need to be sampled for charred plant remains and charcoal. Aceramic features should not be avoided as the plant remains from these features may help to date them. Deep features should be sampled in spits to pick up changes over time. Part, or all of each of the contexts should be processed. In general samples should be processed in their entirety. All flots should be scanned, and some of the residues.

Pollen

Pollen samples can be taken from features such as lakes, ponds, palaeochannels, estuaries, saltmarshes, mires, alluvium and colluvium, and from waterlogged layers in wells, ditches and latrines etc. Substances such as honey, beer or food residues can be detected in vessels. Activities such as threshing, crop processing and the retting of flax can be identified. When taken on site, pollen samples should overlap. Your regional science advisor can advise on the type of corer or auger which would be most appropriate for your site. Samples need to be wrapped in clingfilm and kept dark and cool. Make a description of the sediments in which the pollen was found, and send this with the sample to be assessed.

Forams and diatoms

Coastal or estuary sites (even those which are now well drained) are suitable for sampling for foraminifera. Diatoms can also be found on marine sites, but also in urban settings (sewers, wells, drains, ditches etc). They only survive in waterlogged conditions. These aquatic microfossils are used as proxy indicators of the former aquatic ecological conditions on site, changes in sea levels and temperature, salinity, PH and pollution. Forams are taken from cores, monolith tins or bulk samples. Diatoms are cut from monolith tins or cores or taken as spot

samples.

Insects

Insects, which are useful as palaeoenvironmental indicators, survive best in waterlogged deposits such as palaeochannels and wells. They can provide information on climate change and landscape reconstruction as some species are adapted to particular temperatures, habitats or even particular trees. Certain insects can indicate the function of a feature or building (eg. Weevils, which were introduced by the Romans, often indicate granary sites, parasites will indicate the presence of particular animals such as sheep or horse, latrine flies survive in the

mineral deposits in latrines, or in the daub of medieval buildings etc). Samples need to be sealed (eg. in a plastic box).

Industrial Activity

Where there is evidence for industrial activity, macroscopic technological residues should be collected by hand. Separate samples should be collected for microslags (hammer-scale and spherical droplets). Guidance should be sought from the English Heritage Regional Science Adviser on the sampling strategy for metalworking features and advice on cleaning and packaging. Specialist on-site advice must be sought on identification of metalworking features. Slag and metal working debris must be assessed by a specialist. Scientific analysis (such as x-ray fluorescence, chemical analysis, metallography or scanning electron microscope) of slag can provide information on the melting temperature, chemical composition (is it iron, zinc, copper etc), microstructure (the type and shape of the crystals), physical properties (the hardness or viscosity), isotopic composition (strontium_87 or strontium_88 etc) and mineralogical composition. Guidance is available in the English Heritage "Archaeometallurgy" guidelines, 2001; "Archaeomagnetic dating", 2006 and "Guidelines on the X-radiography of archaeological metalwork", 2006. See also Historical Metallurgy Society, 2008, "Metals and metalworking: a research framework for archaeometallurgy".

Buried soils and sediments

Buried soils and sediment sequences should be inspected and recorded on site by a recognised geoarchaeologist. Procedures and techniques in the English Heritage document "Environmental Archaeology", 2002 and "Geoarchaeology", 2004 should be followed.

Wood

Sampling strategies for wooden structures should follow the methodologies presented in "Waterlogged wood. Guidelines on the recording, sampling, conservation and curation of waterlogged wood" R. Brunning, 1996. If timbers are likely to be present on your site, contact a wood specialist beforehand. Preexcavation planning – determine questions to ask, agree on a sampling strategy, allocate reasonable time and budget. Soil samples should be taken of the sediments surrounding the timber. Keep the timbers wet! Record them asap onsite – plan, photograph, record the size and orientation of the wood (radial, tangential,transverse), any toolmarks, joints, presence of bark, insect damage, recent breaks, and if another piece of wood was on top of or below the piece sampled. Both vertical and horizontal positioning of wattling must be recorded. Wood samples can provide information on woodland management such as medieval coppicing, type of taxa (native or foreign), conversion technology (how the wood was turned into planks), building techniques and type of tools used. Suitable samples should be submitted for dendrochronological dating. See English Heritage guidelines, 2004, "Dendrochronology".

Leather and organic materials

Waterlogged organic materials should be dealt with following recommendations in "Guidelines for the care of waterlogged archaeological leather", English Heritage and Archaeological Leather Group 1995.

2 Animal Bone

Animal bone can explore themes such as hunting and fowling, fishing, plant use, trade network, seasonality, diet, butchery, animal husbandry, food procurement, age structures, farrowing areas, species ratios, local environment. Domestic animal bone was used in prehistoric and Roman cremation rituals. Post medieval cattle bones – small cow bones invariably represent animals which produced high quality buttermilk for cheese. Big 'improved' cattle with large bones were produced for large quantities of meat and poorer quality milk. Large and small cattle bones are often found together on post medieval sites, usually with less of the small bones.

Animal bone assemblages should be assessed by a recognised specialist. The specialist will need to know a brief account of the nature and history of the site, an account of the purpose, methods (details of sampling) for recovery of animal bones, and the main aims and results of the excavation, details of any specific questions that the excavator wants the animal bone specialist to consider, information about other relevant finds from the excavation (e.g. bone tools, fishing equipment, weaving equipment), specific information about each context that has produced significant quantities of animal bone (recovery method, phase, context type, position in relation to major structures, contamination by more recent material, some indication of the amount of bone (by weight or by container size). See "Ancient Monuments Laboratory Advisory Note, "Assessment of animal bone collections from excavations", Sebastian Payne, 1991and "The Assessment of a collection of animal bones", S. Davis, n.d., Ancient Monuments Laboratory.

Fish bone – there was some herring exploitation in the early medieval period. Christian fasting from around 970 allowed fish to be eaten on Fridays which led to a huge demand for fish. There was an increase in marine fishing, fish trade and fish consumption (cod, haddock, ling, herring etc) around 1000 AD. Middens provide evidence of commercial fishing. There was a decline in freshwater fish (cyprinid or carp, salmon, smelt, eel, pike) from the eleventh century.

Smoking fish is a recent practice. They were previously air dried and salted. Newcastle was a major port. Samples should be sieved to retrieve fish and bird bones along with small parts of other animal skeletons and young infused bones. A crane bone was recovered from excavations at Tuthill Stairs, Newcastle – a rare find. Herring bones are so small that they can only be retrieved by 2mm sieving. Clay soils are difficult to sieve, hot water can help. Acidic soils mean poor preservation of bone.

See English Heritage 2002, "Environmental Archaeology – a guide to the theory and practice of methods from sampling and recovery to post excavation", Centre of Archaeology Guideline 1. Isotope analysis can determine where the fish were coming from – North Sea, Scandinavia, Newfoundland, Iceland etc.

There is an excellent reference collection of fish bone at York. Fish bones should be archived to museums for future dating and isotope analysis where this is not undertaken as part of the post-excavation process.

www.fishlab.org

3 Human Remains

Human remains must be treated with care, dignity and respect. Excavators must comply with the relevant legislation (essentially the Burial Act 1857) and local environmental health concerns. If found, human remains must be left in-situ, covered and protected. The archaeological contractor will be responsible for informing the police, coroner, local Environmental Health department and the County Archaeologist. If it is agreed that removal of the remains is essential, the archaeological contractor will apply for a licence from the Home Office and their regulations must be complied with.

Site inspection by a recognised osteologist is desirable for isolated burials and essential for cemeteries. The remains will be recorded in-situ and subsequently lifted, washed in water (without additives). They will be marked and packed to standards compatible with "Excavation and post-excavation treatment of cremated and inhumed human remains", McKinley and Roberts, 1993. After excavation, the remains will be subject to specialist assessment. Analysis of the osteological material should take place according to published guidelines "Human Remains from Archaeological Sites, Guidelines for producing assessment documents and analytical reports, English Heritage, 2002.

Some of the potential benefits from the study of human skeletons – demography, growth profiles, patterns of disease, genetic relationships, activity patterns, diet, burial practices, human evolution. New scientific techniques available include DNA and stable isotope analyses.

Diseases which yield ancient DNA – leprosy, syphilis, tuberculosis, mycobacterium bovis (animal form of TB passed to humans when they shared a living space from Neolithic period onwards). Cremation destroys the crown of the tooth so it cannot be dated (the closure of the cranium vault can be used in adults for dating instead). Cremation also fragments bone, distorts it due to lack of water, shrinks the bone, causes microstructural alteration and destroys organic components (so DNA analysis not possible).

The final placing of the remains after scientific study and analysis will be agreed beforehand.

Further guidance is available in:

"Guidance for best practice for treatment of human remains excavated from

Christian burial grounds in England", The Church of England and English Heritage, 2005 (www.english-heritage.org.uk/upload/pdf/16602_HumanRemains1.pdf)

"Church Archaeology: its care and management", Council for the Care of Churches, 1999

The Advisory Panel on the Archaeology of Christian burials in England can provide free well-informed advice with consideration of relevant religious, ethical, legal, archaeological and scientific issues. Panel's website:

http://www.britarch.ac.uk/churches/humanremains/index.html

or email the secretary simon.mays@english-heritage.org.uk

4 Treasure

Defined as:

• Any metallic object, other than a coin, provided that at least 10% by weight of metal is precious metal and that is at least 300 years old when found

• Any group of two or more metallic objects of any composition of prehistoric date that come from the same find

• All coins from the same find provided that they are at least 300 years old when found, but if the coins contain less than 10% gold or silver there must be at least ten

• Any object, whatever it is made of, that is found in the same place as, or had previously been together with, another object that is Treasure

• Any object that would previously have been treasure trove, but does not fall within the specific categories given above. Only objects that are less than 300 years old, that are made substantially of gold or silver, that have been deliberately hidden with the intention of recovery and whose owners or heirs are unknown will come into this category

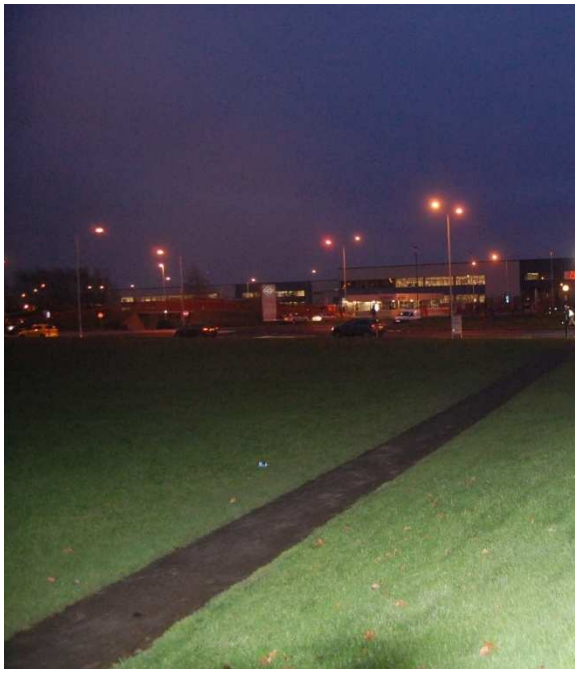
If anything is found which could be Treasure, under the Treasure Act 1996, it is a legal requirement to report it to the local coroner within 14 days of discovery. The Archaeological Contractor must comply with the procedures set out in The Treasure Act 1996. Any treasure must be reported to the coroner and to The Portable Antiquities Scheme Finds Liaison Officer, Rob Collins (0191 2225076 or Robert.Collins@newcastle.ac.uk) who can provide guidance on the Treasure Act procedures.

If you need this information in another format or language, please contact

Jennifer Morrison, Archaeology Officer.

APPENDIX 3: FIGURES

ACCESS ROAD TO A1290, NISSAN WORKS, WASHINGTON ROAD, USWORTH, TYNE AND WEAR



PRELIMINARY EVALUATION REPORT

CP. NO: 1016/09

16/12/2009

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Quality Assurance

This report covers works as outlined in the brief for the above-named project as issued by the relevant authority, and as outlined in the agreed programme of works. Any deviation to the programme of works has been agreed by all parties. The works have been carried out according to the guidelines set out in the Institute for Archaeologists (IfA) Standards, Policy Statements and Codes of Conduct. The report has been prepared in keeping with the guidance set out by North Pennines Archaeology Ltd on the preparation of reports.

REVISION SCHEDULE			
	01	**02**	**03**
PREPARED BY: **POSITION:** **DATE:**	Tony Liddell Supervisor 16/12/2009		
EDITED BY: **POSITION:** **DATE:**	Martin Railton Project Manager 16/12/2009		
APPROVED BY: **POSITION:** **DATE:**	Frank Giecco Principal Archaeologist 16/12/2009		

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SUMMARY

In December 2009, North Pennines Archaeology Limited undertook an archaeological evaluation on land off the A1290 by the Nissan Works at Washington, Sunderland, Tyne and Wear (NGR: NZ 340 588). This was at the request of MDA Developments Ltd, and was in advance of the submission of a planning application for a sustainable manufacturing centre by Gateshead College (Planning Application 09/02486/FUL).

The town of Washington is situated approximately 9km to the west of Sunderland, on the north side of the River Wear. The Nissan factory is located between Sunderland and Washington, on the west side of the A19 and to the north of the A1231, and the development site is directly north of the factory. The development site lies within an area formerly occupied by an airfield constructed in 1916. Hylton or West Moor Airfield was a Flight Station for 'B' Flight of 36 Squadron. In 1917, the airfield was renamed 'Usworth' and was used by 'A' Flight. Previous archaeological research into the site revealed that there were still buildings associated with this early airfield in 1934, with further buildings present throughout the Second World War and into the 1950s. In accordance with PPG16 and UDP Policy B14 a programme of archaeological evaluation was required to ascertain if any trace of these buildings survive.

The field evaluation consisted of four trial trenches, located to target specific remains of buildings from the First World War airfield: the Main Stores, Motor Transport Sheds and Office and the Workshops.

The trenching revealed a relatively uniform stratigraphy, with natural clay underlying all trenches at an average height of 32.83mOD. All trenches contained a modern 20th century deposit overlying the natural substrate, the top of which averaged a datum height of 33.14m. This deposit indicates the level taken during the clearance of the site with any remains of the airfield buildings removed to this depth or below. This deposit also represents the depth of overburden stripped to during the building of the Nissan Works, when the development site was used as a storage and work area: this is demonstrated by the modern crushed hardcore observed in both Trenches C and D. Trench C also showed the use of hardcore to create the landscaped bunds in the northern extent of the site, indicating that the bunds are simply landscape features rather than the remains of earlier airfield buildings.

In Trench A, a concrete drain was uncovered in the northeast corner of the trench set within the modern backfill. While this could be a remnant of the drainage system from the airfield, it is more likely to be part of a drainage system set up while the area was used as a working compound for the construction of the Nissan Works. Trench B revealed a highly truncated concrete wall footing, which bears no relation to the potential remains of the Main Stores which the trench was targeting. However, the alignment does match with the edge of the road to the east of the building, perhaps indicating that the lowest remains of the road edging still remain *in-situ*.

Overall, the trenching revealed that no remnants of the buildings targeted remain in the evaluation area, with concrete footing remains minimal at best, with the majority removed during the 1980s when the area was used as a compound during the construction of the Nissan Works to the south.

The North-East Regional Research Framework 'Shared Visions' notes that there are relatively few World War I remains in the north-east.. The Research Agenda and Strategy in this publication notes that 'remains relating to the First World War must be recorded, and that full recording is necessary of all 20th century military and defence remains where they are affected by development work'. While it is clear from the previous deskbased assessment that the development area was in use during the First and Second World Wars, the remains of the buildings from that period have been destroyed and removed during the 1980s.

ACKNOWLEDGEMENTS

North Pennines Archaeology Ltd would like to thank MDA Development Ltd for commissioning the project.

NPA Ltd would also like to thank Jennifer Morrison, Archaeology Officer for Newcastle City Council, for all her help and assistance throughout the project.

The archaeological evaluation was undertaken by Tony Liddell and Michael McElligott, with the help of machine-driver John Thralkeld. The trenches were surveyed by Matthew Town and Helen Noakes. The report was written and the drawings produced by Tony Liddell. The project was managed by Frank Giecco, Technical Director for NPA Ltd. The report was edited by Martin Railton, Project Manager for NPA Ltd.

1 INTRODUCTION

1.1 CIRCUMSTANCES OF THE PROJECT

1.1.1 In December 2009, North Pennines Archaeology Limited undertook an archaeological evaluation on land off the A1290 by the Nissan Works at Washington, Sunderland, Tyne and Wear College ([NGR: NZ 340 588]; Figure 1). This was at the request of MDA Developments Ltd, and was in advance of the submission of a planning application for a sustainable manufacturing centre by Gateshead.

1.1.2 The town of Washington is situated approximately 9km to the west of Sunderland, on the north side of the River Wear. The Nissan factory is located between Sunderland and Washington, on the west side of the A19 and to the north of the A1231, and the development site is directly north of the factory.

1.1.3 The development site lies within an area formerly occupied by an airfield constructed in 1916. Hylton or West Moor Airfield was a Flight Station for 'B' Flight of 36 Squadron. In 1917, the airfield was renamed 'Usworth' and was used by 'A' Flight. Previous archaeological research into the site revealed that there were still buildings associated with this early airfield in 1934, with further buildings present throughout the Second World War and into the 1950s (Wooler 2009). In accordance with PPG16 and UDP Policy B14 a programme of archaeological evaluation was required to ascertain if any trace of these buildings survive.

1.1.4 This report sets out the results of the work in the form of a short document outlining the findings, followed by a statement of the archaeological potential of the area, an assessment of the impact of the proposed development, and recommendations for further work.

2 METHODOLOGY

2.1 ARCHAEOLOGICAL BRIEF

2.1.1 A *Specification for Preliminary Archaeological Evaluation at Land off access road to A1290, Nissan, Washington Road, Usworth* (Morrison 2009) was produced by Newcastle City Council and a subsequent trench location plan submitted by North Pennines Archaeology Limited on behalf of the client, MDA Developments Limited, for an archaeological evaluation of the development area. The specification and trench location was agreed upon in consultation with the Archaeology Officer for Newcastle City Council.

2.1.2 Following acceptance of the trench location plan by Newcastle City Council, North Pennines Archaeology Ltd was commissioned by MDA Developments Ltd to undertake the work. The specification and trench location plan was adhered to in full, and the work was consistent with the relevant standards and procedures of the Institute for Archaeologists (IfA), and generally accepted best practice.

2.2 ARCHAEOLOGICAL EVALUATION

2.2.1 The field evaluation consisted of four trial trenches, with Trench A measuring 10.0m in length by 1.60m in width, and Trenches B-D 5.0m in length by 3.0m in width. The trenches were located to target specific remains of buildings from the Second World War airfield: the Main Stores, Motor Transport Sheds and Office and the Workshops.

2.2.2 The location and size of the trial trenches were agreed by consultation between North Pennines Archaeology Ltd and Jennifer Morrison, Archaeology Officer for Newcastle City Council.

2.2.3 The aims of the evaluation can be summarised as follows:

- to establish the presence/absence, nature, extent and state of preservation of archaeological remains and to record these where they are observed;
- to establish the character of those features in terms of cuts, soil matrices and interfaces;
- to recover artefactual material, especially that useful for dating purposes;
- to recover palaeoenvironmental material where it survives in order to understand site and landscape formation processes.

2.3 METHODOLOGY

2.3.1 The trenches were located using Trimble Zeiss 3601 Total Station survey using coordinates from the trench location plan.

2.3.2 The trenches were excavated by a mechanical excavator equipped with a toothless 1.6m wide ditching bucket, under archaeological supervision, to the top of the natural substrate. Each trench was then manually cleaned and any putative archaeological features investigated and recorded according to the North Pennines Archaeology Ltd standard procedure as set out in the NPA Excavation Manual (Giecco 2003).

2.3.3 A photographic record was made using digital photography, 400 ISO Black and White print and 200 ISO Colour Slide film.

2.3.4 All work was undertaken in accordance with the Institute for Archaeologists Standards and Guidance for Archaeological Field Evaluations (IfA 2008).

2.4 THE ARCHIVE

2.4.1 A full professional archive has been compiled in accordance with the specification, and in line with current UKIC (1990) and English Heritage Guidelines (1991) and according to the Archaeological Archives Forum recommendations (Brown 2007). The archive, including the physical and paper archive and copies of the report, will be sent to Tullie House, Carlisle, and will be made available upon request. The archive can be accessed under the unique project identifier NPA09, GCN-A, CP 1016/09.

2.4.2 North Pennines Archaeology supports the **O**nline **A**cces**S** to the **I**ndex of Archaeological Investigation**S** (**OASIS**) project. This project aims to provide an on-line index and access to the extensive and expanding body of grey literature, created as a result of developer-funded archaeological work. As a result, details of the results of this project will be made available by North Pennines Archaeology, and can be accessed under the unique identification number *northpen3- 69355*.

3 BACKGROUND

3.1 LOCATION AND GEOLOGICAL CONTEXT

3.1.1 The city of Sunderland is located in the north-east of England, approximately 16km to the south-east of Newcastle upon Tyne and c.14km to the north-east of Durham. The town of Washington is situated approximately 9km to the west of Sunderland, on the north side of the River Wear. The Nissan factory is located between Sunderland and Washington, on the west side of the A19 and to the north of the A1231.

3.1.2 The topography of the area in and around Sunderland is determined by the geological structure. The strata found in the area are carboniferous coal measures and deposited Permian limestone overlay by glacial drift and alluvium. This limestone overlay rises in a more or less gentle slope under its blanket of glacial drift from the coast to a western escarpment about 500ft above sea level (Countryside Commission 1998).

3.2 HISTORICAL CONTEXT

3.2.1 *Introduction:* this historical background is compiled from the Desk Based Assessment (Wooler 2009) and is intended only as a summary of historical developments specific to the study area.

3.2.2 The place name Usworth is thought to stem from the Old English "burn by Osa's road".

3.2.3 ***Prehistoric Period (pre c.AD 43)***: no prehistoric activity located close to the proposed development area was noted in material consulted for the Desk Based Assessment. The Archaeological Data Service, however, contains an entry in its online catalogue for a possible prehistoric or Roman rectilinear site within an oval enclosure at grid reference NZ 333 90, to the north-west of Usworth airfield, between the Three Horse Shoes and North Moor Farm.

3.2.4 In the nearby vicinity, evidence for human settlement and activity in the Hylton area comes largely from findspots. In 1885 a dug-out canoe was found in the bed of the River Wear at Hylton. A second similar canoe was already known to Sunderland Museum as they had in their collection a photograph showing a fragmentary example. This canoe was believed to have been dredged from the River Wear between Hylton Dene and Southwick. The two canoes are suggested to have dated to the late Bronze Age or the Iron Age. Other prehistoric finds within the locality of Hylton include a bronze socketed axe from the Wear and two late Bronze Age swords from the Wear at Ford. The axe and two swords (which are of the Park Ewart type) are considered to be c.900-700BC.

3.2.5 In the wider landscape, prehistoric activity is evidenced by Bronze Age burials at Humbleton Hill and Hastings Hill, and Mesolithic and Neolithic flints and arrowheads have been found at Grindon, all on the south side the River Wear. Mesolithic to late Bronze/early Iron Age occupation have been discovered at Bishopwearmouth, also on the south side of the Wear, and prehistoric burials and enclosures are known at Fulwell and Carley Hill on the north side of the river, and to the east of Hylton.

3.2.6 ***Romano-British Period (c.AD 43-400)***: in 1939, a hoard of Roman coins were found at Washington Station. The hoard contained 59 coins including one minted during the reign of Emperor Constantine (possibly 4th century AD). There is no evidence as yet for activity during this period in close proximity to the proposed development area although the cropmarks already referred to may date to this period. It has been mentioned by Mr Fulton at the North East Aircraft Museum, that 'Roman remains' were found during preparatory work for the construction of the Nissan plant on the former airfield. No written confirmation of this has, however, been found during the desk-based assessment.

3.2.7 The main evidence for occupation of the area around Sunderland during this period is in the form of burials and coins. In 1759 a cist containing a large skeleton was uncovered at Fulwell during limestone quarrying. Two coins dating from the beginning of the 3rd century were found close by. To the north, near the Carley Hill quarry, a bronze figurine of Jupiter Dolichenus, a Romano-British god, was discovered in 1820. In 1971 the hill also yielded two Roman coins dating from the 2nd to the 3rd centuries. To the west at Southwick quarry, pieces of Roman pottery, including the remains of a late 4th century cooling pot were found in 1927. Coins from the period have also been found at and around Hylton, as well as a possible Roman milestone inscribed with a dedication to the Emperor Gordian (AD 238-44) found in the Wear and recorded by the prominent antiquarian, Robert Surtees, although its exact find spot is unknown.

3.2.8 ***Early Medieval Period (c.AD 400-1066)***: the only evidence for activity or settlement during this period comes from place names, as already referred to in 3.2.2 above. What is now known as Tyne and Wear was certainly an important area during this period as show by early Christian sites such as Jarrow (HER 1227), Tynemouth (HER 124-9) and Monkwearmouth which was founded by Bishop Bishop in 674AD (HER 87). There is no evidence of activity during this period in close proximity to the proposed development area, although as with earlier periods this does not mean a total absence of settlement or land use.

3.2.9 ***Medieval Period (c.AD 1066-1485)***: there is no evidence of medieval activity in the vicinity of the proposed development area. It is possible that the land may have been on the edges of Hylton Castle estate, and may have been waste, common or agricultural in nature.

3.2.10 Hylton Castle, located to the east of the proposed development area and now surrounded by housing, was built by Sir William Hylton as a gatehouse style fortified manor house. Although no construction records survive, the style of the architecture and coats of arms on the west front mean that it dates to the 1390s or the first decade of the 1400s. Other buildings may have existed on the site at this time, as the inventory taken on Sir William's death in 1435 mentions a hall, four chambers, two barns, a kitchen and the chapel in addition to the castle. Early in the 18th century, Baron John Hylton made the first major alterations. He completely redesigned the interior and inserted large windows in the fashionable Italianate style. His son, John, made even greater alterations. He built a south wing and added crenallations to both wings. When he died in 1746, the Hyltons sold the castle, as there was no male heir to inherit it. Successive owners failed to maintain it, and in 1863 it was bought by William Briggs, who knocked down the north and south wings, gutted the interior and added new windows. The chapel at Hylton Castle, dedicated to St Catherine, is known to have existed on the site since 1157, when it was likely that Hylton Castle was a wooden building. Nothing remains of the first chapel and the ruins seen today date from the early 15th century.

3.2.11 Like the rest of Monkwearmouth parish, Hylton had presumably been part of the lands of the Anglian monastery, but after the Norman Conquest it did not pass with the other townships to the priory's monastic cell. From the 12th century, and perhaps earlier, the manor and township of Hylton belonged to the Hilton family who took their name from the estate. There is evidence that there was a mill at Hylton by the late 12th century, although its precise location if unknown. If it was a watermill if may have stood at Hylton Dene. In later centuries a windmill was sited to the north of the castle.

3.2.12 ***Post-Medieval Period (c.AD 1485-1900)***: writing in 1967, Bennett refers to the 'Blackwood' located beside Usworth Aerodrome, as providing some idea of what the countryside was like in the area before any clearance was undertaken, although the exact location of the 'Blackwood' does not appear to be shown on any historical mapping. He noted that the land between Biddick Forest and the Three Horse Shoes was drained in 1820. Oak was mainly grown in Biddick Forest, and for centuries it was exported from Sunderland port, providing a considerable trade in hardwood as well as coal.

3.2.13 Nearby Hylton Castle was the site of skirmishes during the Civil War in the middle of the 17th century. Corfe noted that these skirmishes took place on high ground to the north of the castle in 1644.

3.2.14 Industries along the Wear appear to have been well established by the early 19th century. Parson and White refer to industry at Southwick (1¼ miles north-west of Sunderland and to the east of Hylton) on the north bank of the river, which included several shipyards, lime-kilns and earthenware and glass manufactories. The trade directory in Parson and White lists the trades in the township of Hylton in 1828, these appear to be more agricultural in nature rather than industrial, apart from Auston Dixon & Co, earthenware manufacturers at Hylton Ferry and Robert Reay, shipbuilder and timber merchant at the same location. Farms such as Cow Stand (occupied by Marmaduke Robinson), West Moor (Thomas Reed) and South Moor (George and James Curry), all previously located within close proximity to the proposed development area, were all in existence at this date. The Three Horse Shoes is listed as occupied by John Merriman, victualler and blacksmith, at 'Road Stone' in Hylton township; this may be an earlier name for the site although it is not shown on later mapping. North Hylton appears to have been more industrial than the rest of the township, no doubt due to its proximity to the river. Brett refers to industries such as iron ore (on land close to the ship building yards); charcoal; lamp black; grindstones and whetstones (North Hylton had quarries that yielded grindstones in the 17th and 18th centuries) which were exported all around the world; sandstone quarried from sites such as Wood House at North Hylton; tar; a pottery had been established at North Hylton in 1762 by the Maling family. The Malings had been Huguenot refugees who settle in Scarborough before moving to Sunderland. Rich clay beds and the riverside location for east of transport on the Wood House estate made it an ideal site for a pottery. The outbreak of the Crimean War in 1854 signaled an upturn in industry in North Hylton. The old pottery building was turned into a forge and iron works and shipbuilding yards sprang up on vacant lots on the riverside.

3.2.15 With reference to Hylton Colliery (or Castletown Colliery), Brett noted that the Wearmouth Coal Company bought the Wear Steel Works, 36 acres of land and 190 workmen's cottage for £37 000. The company began work on sinking the first shaft in March 1897. In October 1900 the mine was still being developed but was still producing 500 tons of coal a day. Output almost doubled when Hylton was at its peak and the workforce topped the 1000 mark. In 1907 the coal company bought the whole of the 2000 acres Hylton Castle Estate including the castle. As they already owned the coal rights the purchase was made as an investment. In the late 1970s Hylton was one of a number of small Durham collieries which ceased mining coal, the

pit finally closed in July 1979. The colliery at Hylton (located approximately 2km to the south-east of the proposed development area) was not the only colliery site in the area; Usworth Colliery is shown on the Ordnance Survey map of 1921 (HER No. 365) and a colliery also existed at Boldon to the north which opened in 1862 and closed in 1982 (HER No. 2567). There does not appear to have been any collieries within close proximity to the proposed development area.

3.2.16 The mining of coal was greatly aided by the railways. The colliery at Usworth (NZ 315 584) was served by sidings alongside what became the North Eastern Railway line from Washington to Pelaw, ½ mile north of Usworth Station. Prior to the first locomotives, trucks on these sidings were almost certainly shunted by horses33. The Pontop and South Shields Branch of the North Eastern Railway was originally the Stanhope and Tyne Railway which opened in 1834 as the first public railway on Tyneside. It carried minerals from County Durham to the Tyne and passengers from South Shields to the Durham Turnpike (HER No. 2290). The Hylton, Southwick and Monkwearmouth Railway was formed in 1871 to develop industry on the north bank of the Tyne. It opened in 1876 between the NER line at Monkwearmouth and the NER's Tyne Dock-Consett line at Southwick Junction, although the latter connection was removed shortly after. Both the Pontop and South Shields Branch of the NER and the Hylton, Southwick and Monkwearmouth branch line are located to the west and the south of the proposed development site respectively. There was no evidence that any railway lines or associated features crossed the proposed development area.

3.2.17 ***Modern (1900-Present)***: the industrial nature of the area around Sunderland, such as shipbuilding and coal mining, meant that the town and its hinterland were obvious German targets during the First World War. In April 1916, for example, a Zeppelin passed over Seaham harbour and crossed over the colliery villages towards Washington. Fourteen explosive bombs and seven incendiary bombs were dropped within five minutes. The first bomb in Sunderland landed in a yard in Peacock Street. The Zeppelin then made its way towards Monkwearmouth goods yard, hitting North Bridge Street, the tramway sheds and the Workmen's Hall (Calvert Street). The greatest amount of damage was done to Fern Street, North Bridge Street and Victor Street.

3.2.18 As a consequence of Zeppelin raids on the area around Sunderland, an airfield was created outside the town in October 1916 as a Station for 'B' Flight of No. 36 Squadron. It was originally known as Hylton, although when it was being prepared it was known as West Town Moor. Due to the increase in German bombing, the Royal Flying Corps undertook the task of Home Defence, setting up a number of squadrons, with flights spread over

the length of the British coastline. The north-east was protected by No. 36 Home Defence Squadron, which was formed by Capt. R O Abercromby at Cramlington in February 1916. No. 36 Home Defence Squadron defended the coast between Whitby and Newcastle. The main base was at Cramlington, to the north of Newcastle, with flights being attached to Seaton Carew and Ashington, as well as Hylton. By August 1918 Hylton was in use by 'A' Flight and continued as such until the Armistice, when it was just beginning to become known as Usworth.

3.2.19 Following the end of the First World War, Usworth airfield reverted to non-flying use, as was the case with many First World War aerodromes. Usworth languished unused for over a decade, apart from at least one visit by Alan Cobham's Flying Circus, until it was re-activated on March 17th 1930. From this period, the flying field was located to the south side of the road between Washington and Sunderland, and ancillary buildings were located to the north. The airfield was designed to accommodate one squadron of the recently expanded Royal Auxiliary Air Force, No. 607 (County of Durham) Squadron. North Camp was provided with living quarters and dining facilities for Officers, NCOs and airmen. It was initially proposed to erect canvas Besoneaux Hangars on the South Camp, however these were rejected in favour of the erection of a large Lamella Hangar. The South Camp also housed the Squadron Office, pilot huts, armoury, photographic hut and bombing training aids. The firing butts were alongside the railway. On 24th 1934, the airfield was opened to the public on Empire Air Day; this attracted 1300 visitors with an estimated 5000 other spectators watching the flying displays form outside the airfield. Proceeds from the Empire Air Day went to the RAF Benevolent Fund. The Empire Air Day in 1937, as well as having flying demonstrations and aerobatics, also included the erection of a dummy fort near the southern perimeter of the airfield, which was the subject of 'attacks' by the Hinds of 103 Squadron with the Demons of No. 607 Squadron 'defending'.

3.2.20 In September 1939 work commenced on the laying of two concrete runways, as well as the expansion of the airfield to the south, east and west by taking in adjoining fields. The new 2800 feet (c.900m) long runway was laid northwest to south-east, with another of similar length on a north-south heading. A new perimeter track was laid out along the airfield boundary with eight dispersal pens, each capable of holding a twin-engined aircraft. There were also 34 hard standings for single-engined fighters. Three of the older Callender Hangers were dismantled, leaving the Lamella and a single Callender hangar opposite the main gate. Additional buildings were constructed between the airfield and the road. An Operations Room was built near the Lamella hangar; this was later supplemented by an

underground Battle Headquarters near the Cow Stand Farm corner of the airfield. On the North Camp side new accommodation blocks were erected for the expected large influx of personnel which included WAAFs. On both sides of the road numerous air raid shelters were constructed. To assist in the defence of the airfield a series of dispersed sites were set up over a wide area around the site; these included a searchlight camp at the top of Ferryboat Lane and small gunposts on the Birtley Road, above the old quarries at the bottom end of Boldon Bank and along the disused railway line towards North Hylton. At Downhill Farm a large gun site was set up, and a decontamination centre was constructed well away from the airfield. During the Second World War, a watch tower was constructed on stilts on the roof of the Three Horse Shoes; the pub also acted as a Mess for Officers during this period.

3.2.21 In the publication *Archaeology of the Twentieth Century Defence Sites of Tyne and Wear: An Illustrated Guide*, several sites in and around the airfield at Usworth are listed. Of particular interest are the Pickett-Hamilton Forts, which were a form of pillbox unique to airfields, and which were often placed down the very centre of the runway. Pickett-Hamilton Forts were sunken, circular reinforced concrete pillboxes which remained flush with the airfields surface to permit the free movement of aircraft. If there was a threat of attack, however, the forts would be raised by a hand operated hydraulic jack and manned with guns.

3.2.22 Sunderland and its surrounding area did not escape bombing during the Second World War. The first bombs dropped on the district fell soon after midnight on the 22nd June 1940. Areas affected included buildings at the Old Rectory at Whitburn, a field near Church Lane and The Bents, and the Fishermen's Cottages, which narrowly escaped being demolished. An incendiary bomb fell onto Hylton Dene, 100 yards from Hylton Colliery, Castletown.

3.2.23 The airfield at Usworth had the distinction of being singled out for a major Luftwaffe attack during the Battle of Britain. On August 15th 1940, German aircraft were detected approaching the east coast of Britain. Spitfires from 72 Squadron Ackington met them off the Farne Islands, and although heavily outnumbered, several German aircraft were destroyed. The German formation then split in two, one portion making for Tyneside, while the other turned south. The Second Acklington Squadron, No. 79, encountered the northern group just off the coast and a wild dog-fight ensued. Reforming, the Hurricanes caught up with the bombers approaching Newcastle, where their primary objective would appear to have been Usworth. Harried by the Tyne guns and by more Hurricanes from Drem in

Scotland, the German 'Heinkels' made off, scattering their bombs with little effect, and leaving Usworth untouched.

3.2.24 For much of the Second World War, Usworth was used for training, with pilots of several nations stationed there, including Polish, Czech, Canadian, Australians, Americans and New Zealanders. The training of new pilots up to operational status was a hazardous activity with many aircraft damaged or destroyed during this period. Many of these pilots have their last resting place in Castletown cemetery near the airfield.

3.2.26 Following the end of the Second World War, Usworth was home to No. 31 Gliding School which had formed around 1944. The role of the Gliding School was to provide elementary flying training to cadets of the Air Training Corps from local squadrons in the north-east. In 1951 control of Usworth passed to No. 2 Basic Air Navigation School which disbanded in 1953 when control passed to Durham University Air Squadron. In 1958 the Gliding School, the University Air Squadron and the G.C.I aircraft were moved to RAF Ouston as Usworth was to close, although some limited use of the site was made by the Territorial Army for parachute training from tethered balloons. On 3rd July 1962, Usworth was bought by Sunderland Corporation for £27, 000 and reopened as Sunderland Airport.

3.2.27 Sunderland Corporation re-laid the runways and renovated the hangar, and in June 1963 Sunderland Flying Club came into being. On June 28th 1964 an Open Day and commemorative ceremony took place to celebrate the rebirth of what became Sunderland Airport. The Air Day in 1964 became an annual event with subsequent shows attracting greater participation. Sunderland Air Day in June 1981 attracted an estimated 50, 000 people to the airfield and surrounding hills. In the 1980s, 700 people a year made their first parachute jump at Sunderland Airport.

3.2.28 During the 1970s and 1980s, the collapse of manufacturing in the Sunderland area had a detrimental effect on employment. For example, over 34 000 jobs were lost between 1971 and 1981 alone. In the 1980s the economic outlook was bleak, although Sunderland enjoyed Development Area status and was eligible for maximum Urban Aid and EEC grants. The co-ordinated efforts of Sunderland Borough, Tyne and Wear Council, Washington Development Corporation and the government scored a major success in 1984 when they succeeded in attracting Nissan to build its new UK factory on Wearside. The massive Nissan plant was constructed on the 297 acre site of Sunderland (Usworth) Airport.

3.3 PREVIOUS WORK

3.3.1 In 2005, Archaeological Services University of Durham (ASUD) undertook an archaeological desk-based assessment and archaeological monitoring at Nissan Wind Farm (NZ 339 579, to the south of the Nissan factory). The desk-based assessment noted that although there was no direct evidence for prehistoric or Roman activity in the development area the presence of activity in the surrounding vicinity indicated that an as yet unidentified resource has the potential to exist. It was also noted that the use of the site as an airfield in the First and Second World Wars suggested that the site may have undergone significant landscaping to provide a level area for aircraft to land and take off.

3.3.2 An archaeological desk-based assessment was undertaken by On Site Archaeology Ltd (OSA) of land at Nissan Factory Business Park (located between the Nissan factory and the A1231 to the south), Washington, in July 2007 . The work concluded that there was the possibility that buried remains were present on the site, which could date from any period between the early Bronze Age and the present day. It was noted that the remains may survive as features cut into the natural subsoil and would possibly be visible immediately below the topsoil and B-horizon. The top of the archaeology was suggested to be located between 0.2m and 0.5m below the present ground surface.

3.3.3 A geophysical survey was undertaken by Met Surveys in April 2008 at Turbine Business Park, on land to the north of the A1231. The survey covered an area of approximately 20 hectares which at the time was rough pasture. The site had been in agricultural use for the past 20 years and although there were no known sites within the area, it was considered that there was the potential for buried archaeological remains to exist. The survey results revealed no features of archaeological significance, although modern services were noted to run across the site as evidence by manholes. The remains of ridge and furrow were detected in some parts of the site indicating the past agricultural use of the land, but their nature (narrow, closely spaced and straight) suggested they were of relatively modern origin.

3.3.4 Following on from the geophysical survey undertaken by Met Surveys, On Site Archaeology (OSA) conducted an archaeological evaluation on the land at Turbine Park in August 2008. Features such as the ridge and furrow and areas of disturbed ground, highlighted by the geophysical results, were targeted with the evaluation trenches. The work concluded that despite sites apparently rural appearance, it was clear that the site had been heavily re-worked during the 20th century. For example, the central, western and

northern parts of the site had been used to dispose unwanted waste material from building, which may have originated from the construction of the airfield, the test track or the nearby road. In all cases the method of dumping was the same; the topsoil was removed, the 'fill' material was dumped and then the topsoil was reinstated. The only feature potentially older than the 20th century was found in Trench 1 and consisted of a shallow linear feature containing small fragments of white-glazed pottery of 19th or 20th century date. Interestingly, the areas of ridge and furrow apparently revealed by the geophysical survey, and tested by Trenches 6, 8, 9 and 10, were not found. In the cases of Trenches 6 and 8 the presence of respectively c.0.70m thick and a 1.5m thick layer of dumped material would have prevented the detection of any preserved ridge and furrow.

3.3.5 In June 2009, North Pennines Archaeology Limited were commissioned by MDA Consulting Ltd to undertake an archaeological desk-based assessment of the current development area prior to the submission of a planning application for a sustainable manufacturing centre by Gateshead College. The desk-based assessment revealed that the proposed development area appears to have been undeveloped until the construction of the airfield at Usworth in 1916. The land appears to have been agricultural in character, despite industrial activity within close proximity (for example, the various railway branch lines, collieries and brick works). The assessment also demonstrated that Usworth Airfield started life in October 1916 as a Flight Station for 'B' Flight of 36 Squadron, and was initially known as Hylton or West Town Moor. By 1917, when it was used by 'A' Flight, it was starting to be known as Usworth. For most of its wartime career Usworth was a training station. Aerial photographs from 1934 show buildings at the airfield were located on the site of the proposed development area, with the main entrance situated in the approximate location of the present footpath. A map of 1945 shows the extent of the buildings on the site at that date; although these were mostly constructed of timber it is likely these structures sat on brick or concrete footings. An aerial photograph dating to 1941/1942 showed two cropmarks located to the west of the proposed development area; it is not known if these relate to the airfield or are totally unrelated, but they may suggest earlier activity in close proximity to the airfield site.

4 EVALUATION RESULTS

4.1 INTRODUCTION

4.1.1 The trenches were excavated down to the natural substrate where possible, followed by further hand excavation of potential archaeological features allowing an examination of any prospective archaeological remains. Trench locations are depicted in Figure 2.

4.1.2 Plans and sections of Trenches A, B and D can be found on Figure 3, and a plan and section of Trench C can be found on Figure 4.

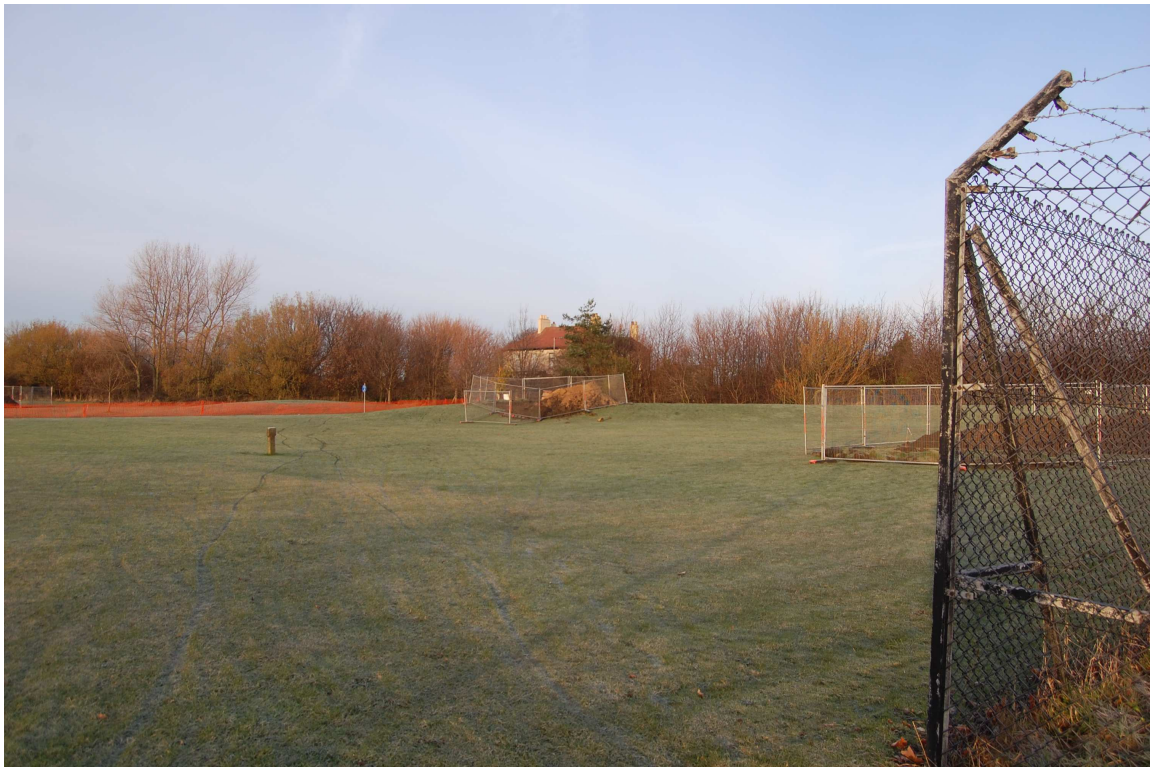

Plate 1. *The site looking northwest.*

4.2 TRENCH A

4.2.1 Trench A measured 10.00m in length and 1.60 in width, and was orientated roughly east-west.

4.2.2 The trench was located to evaluate the potential remains of the western and northern extensions of the Main Stores for the airbase, known to have been of timber construction.

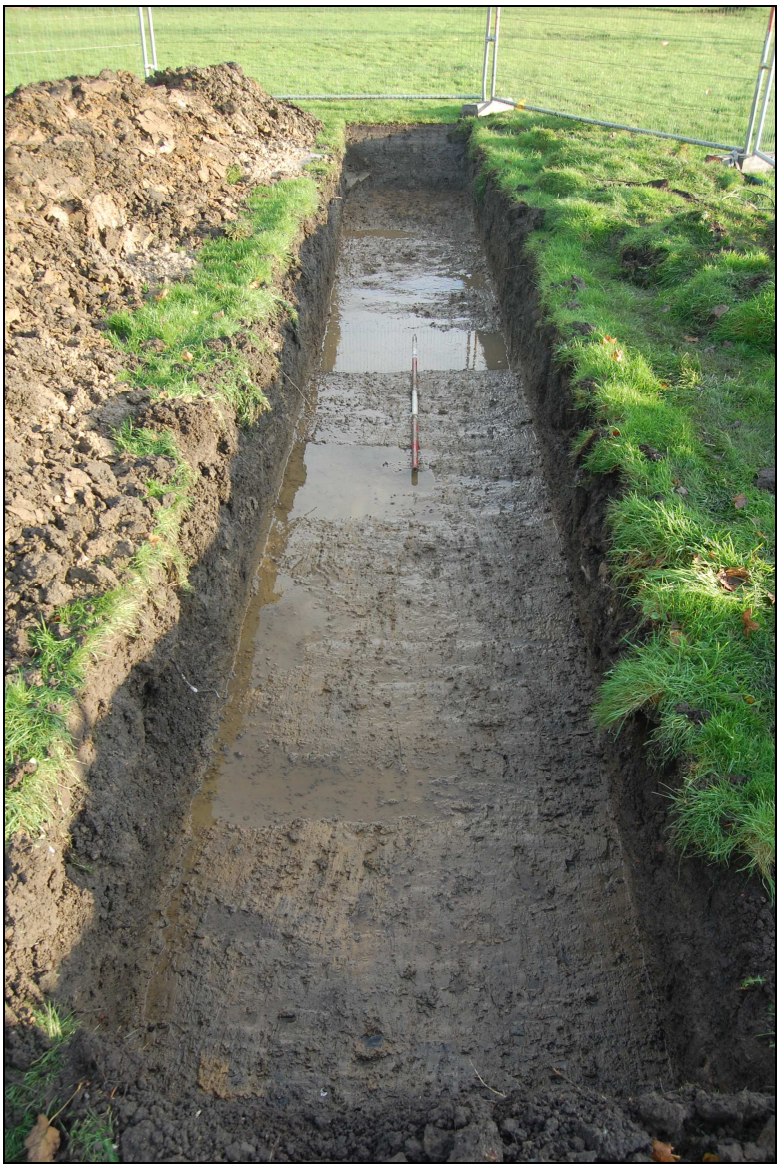

***Plate 2**. Trench A, looking east.*

4.2.3 The natural substrate, context (**102**), was found to be a compact orange/brown sandy clay averaging a depth of 0.68m below the current surface (and at an Ordnance Datum of 32.96m). Above the natural clay was a c.0.35m thick deposit of 20th century backfill, context (**104**), which was a compact mid-grey/brown silty clay with inclusions of small stones, concrete slivers and brick fragments. Above the backfill was a modern subsoil layer, context (**101**), which measured c.0.22m thick and was comprised of loose mid-brown sandy clay. Topsoil and turf, context (**100**), sealed the subsoil with an average depth of 0.14m.

4.2.4 In the north east corner of the trench the edge of a concrete drain, context (**108**), was uncovered aligned northwest-southeast, and sitting within the

modern backfill at 33.12mOD. This suggests that either the drain is not *in-situ*, or that the backfill context was laid at the same time as the drain, possibly as a packing 'foundation' layer for the building.

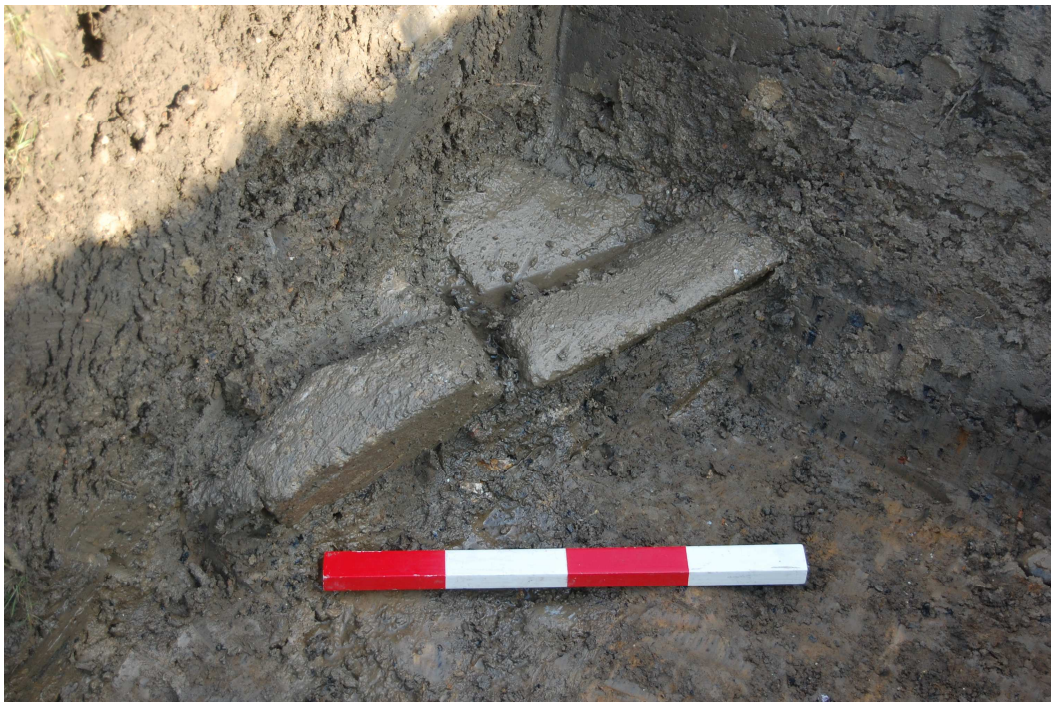

***Plate 3**. Drain (**108**) looking north-east.*

4.2.5 Fragments of late 20th century pottery and glass were recovered from context (**104**), with the other strata remaining artefactually sterile. No deposits were deemed suitable for environmental sampling.

4.3 TRENCH B

4.3.1 Trench B measured 5.0m in length and 3.0m in width, and was orientated roughly east-west .

4.3.2 The trench was located to evaluate the potential remains of the eastern extension of the Main Stores for the airbase, known to have been of timber construction.

4.3.3 The natural substrate, context (**102**), averaged a depth of 0.89m below the current surface (Ordnance Datum of 32.54m). Over the natural clay was a c.0.45m thick deposit of context (**104**), comprising 20th century backfill, above which was the modern subsoil layer, context (**101**), which measured c.0.22m

Topsoil and turf, context (**100**), sealed the subsoil with an average depth of 0.22m.

4.3.4 In the western extent of the trench was the remains of a concrete wall footing (**106**), aligned roughly northwest-southeast (Plate 5). The footing of the wall lay at 32.85m OD, measured 0.47m in width and spanned the width of the trench. The concrete lay on a thin deposit of context (**107**), a black ash and grit deposit which made up the lowest foundation strata of the wall remains.

4.3.5 Fragments of 20th century pottery and glass were recovered from context (**104**), with the other strata remaining sterile of artefacts. No deposits were deemed viable for environmental sampling.

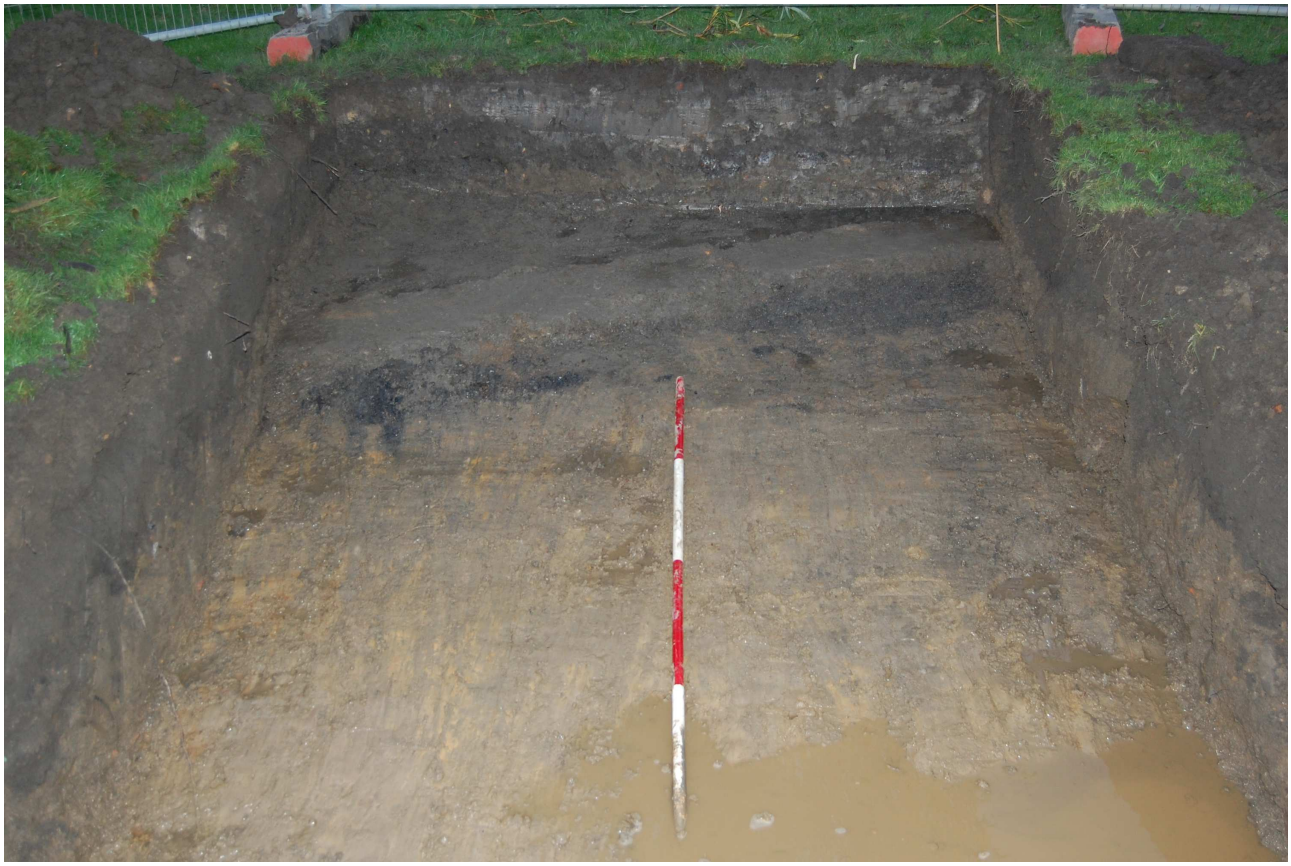

Plate 4. *Trench B, looking west.*

***Plate 5**. Wall footing (106), looking north.*

4.4 TRENCH C

4.4.1 Trench C measured 5.0m in length and 3.0m in width, and was orientated roughly north-south on the crest of a bund bordering the north side of the plot of land to the east of the dividing public path.

4.4.2 The trench was located to evaluate the potential remains of the Motor Transport Sheds and Office for the airbase, known to have been of timber construction.

4.3.3 In this trench, the natural substrate was not revealed due to the trench depth exceeding the reach of the mechanical excavator's bucket due to the trench's position on the bund. The depth excavated reached a vertical 2.02m, with the 20th century backfill layer, context (**104**), revealed 1.70m below the current surface. Over this layer was a 1.06m thick deposit of pale yellow crushed

hardcore, context (**103**), which formed the core of the bund's structure. Above the hardcore was a 0.27m thick deposit of modern subsoil, context (**101**), sealed by a 0.37m deposit of topsoil and turf, context (**100**).

4.3.4 Due to the highly unstable nature of the hardcore, the trench was stepped inwards and the deepest section of the excavation was not entered for recording purposes on Health and Safety grounds.

4.3.5 No artefactual or structural remains were recovered from this trench, and no deposits were deemed suitable for environmental sampling.

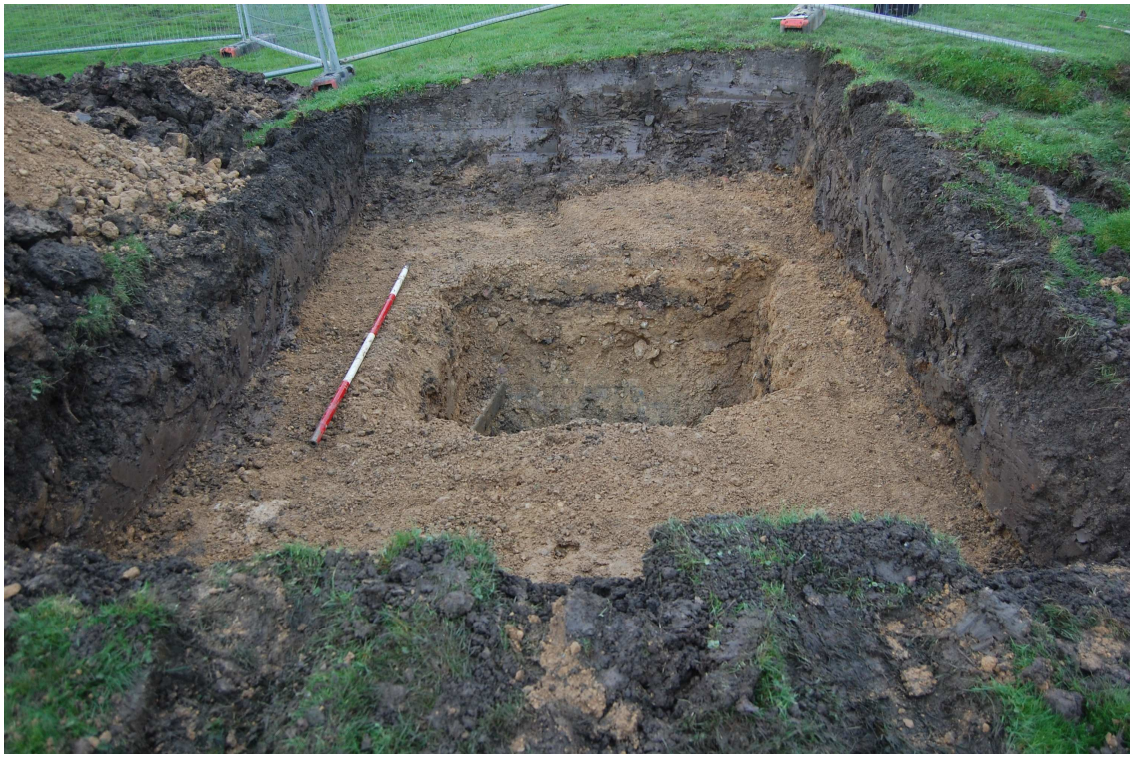

***Plate 6**. Trench C, looking south.*

4.5 TRENCH D

4.5.1 Trench D measured 5.0m in length and 3.0m in width, and was orientated roughly east-west in the eastern extent of the development area.

4.5.2 The trench was located to evaluate the potential remains of the main Workshops for the airbase, known to have been of timber construction.

4.3.3 The natural substrate, context (**102**), was found at a depth of c.0.75m below the current surface (and at an Ordnance Datum of 32.99m). Above the natural clay was a c.0.37m thick deposit of 20th century backfill, context (**104**). Above the backfill was a thin 0.06m thick deposit of pale yellow crushed hardcore, context (**103**), sealed by a c.0.17m thick layer of modern subsoil, context (**101**). As with the previous three trenches, Trench D was

sealed by topsoil and turf, context (**100**), measuring an average thickness of 0.11m.

4.3.4 At the south-western extent of the trench a concrete block, context (**105**), was found embedded in the natural clay. This block measured 0.64m in length, 0.31m in width and had a visible depth of 0.19m. The block was highly degraded, and although it could perhaps have been the remains of a concrete plinth or footing, it is more likely that it is a disturbed block pushed into the natural clay during the leveling of the site.

4.3.5 Fragments of early 20th century pottery were recovered from context (**104**), with the other strata remaining artefactually sterile. No deposits were deemed viable for environmental sampling.

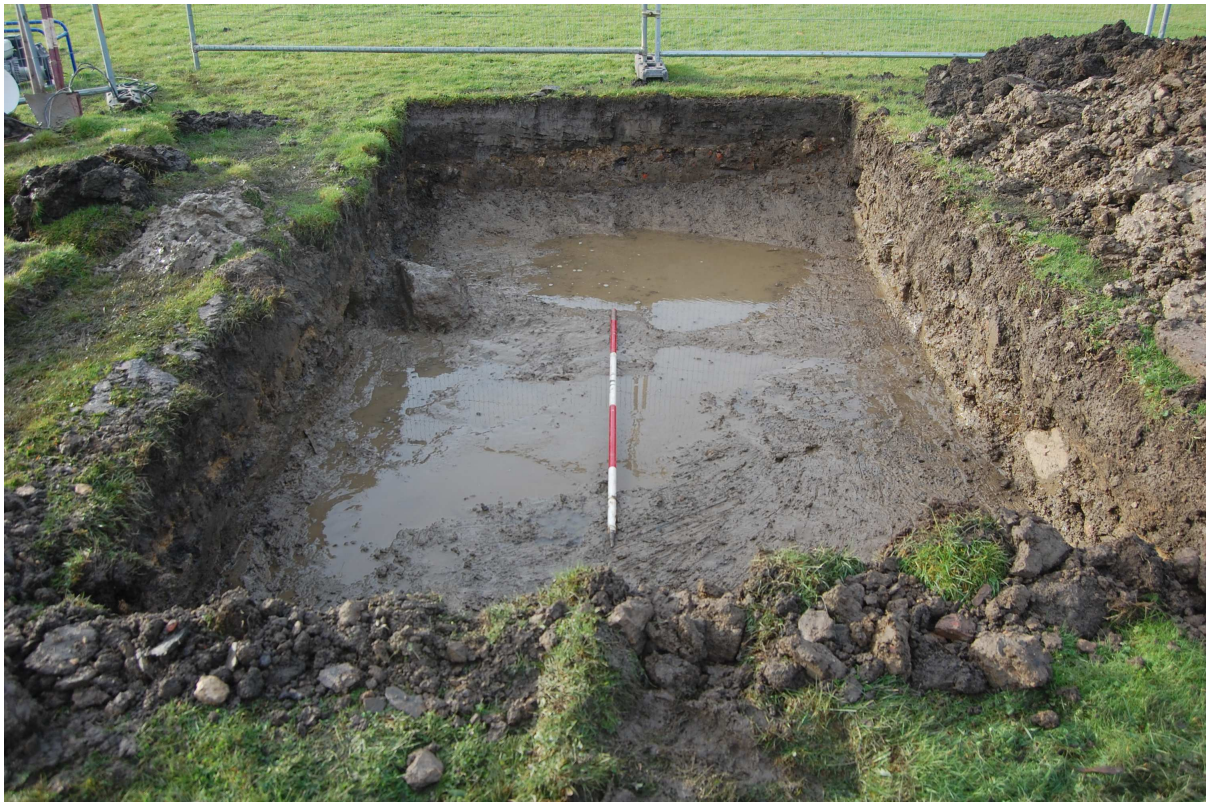

Plate 7. *Trench D, looking west.*

5 CONCLUSIONS AND RECOMMENDATIONS

5.1 CONCLUSIONS

5.1.1 The trenching revealed a relatively uniform stratigraphy, with natural clay underlying all trenches (this is assumed for Trench C) at an average height of 32.83mOD.

5.1.2 All trenches contained a modern 20th century deposit overlying the natural substrate, the top of which averaged a datum height of 33.14mOD. This deposit indicates the level taken during the clearance of the site with any remains of the airfield buildings removed to this depth or below. This deposit also represents the depth of overburden stripped to during the building of the Nissan Works, when the development site was used as a storage and work area: this is demonstrated by the modern crushed hardcore observed in both Trenches C and D. Trench C also showed the use of hardcore to create the landscaped bunds in the northern extent of the site, indicating that the bunds are simply landscape features rather than the remains of airfield buildings.

5.1.3 In Trench A, a concrete drain was uncovered in the northeast corner of the trench set within the modern backfill. While this could be a remnant of the drainage system from the airfield, it is more likely to be part of a drainage system set up while the area was used as a working compound for the construction of the Nissan Works.

5.1.4 Trench B revealed a highly truncated concrete wall footing, which bears no relation to the potential remains of the Main Stores which the trench was targeting. However, the alignment does match with the edge of the road to the east of the building, perhaps indicating that the lowest remains of the road edging still remain *in-situ*.

5.1.5 Overall, the trenching revealed that no timber remains of the buildings targeted remain in the evaluation area, with concrete footing remains minimal at best, with the majority removed during the 1980s when the area was used as a compound during the construction of the Nissan Works to the south.

5.2 RECOMMENDATIONS

5.2.1 The potential for archaeological remains within the development area remains low. Given the lack of any significant archaeological features during the evaluation it is recommended that no further work takes place.

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APPENDIX 1: CONTEXT TABLE

Context	Context Type	Description
(100)	Deposit	Modern topsoil and turf.
(101)	Deposit	Modern subsoil.
(102)	Natural Substrate	Yellow-brown compact sandy clay.
(103)	Deposit	Crushed hardcore in Trenches C and D.
(104)	Deposit	Modern backfill.
(105)	Deposit	Concrete block embedded in natural clay in Trench D.
(106)	Deposit	Concrete wall footing in Trench B.
(107)	Deposit	Packing material for wall footing (106).
(108)	Deposit	Concrete drain in Trench A.

***Table 1**. List of Contexts issued during the Evaluation*

APPENDIX 2: BRIEF

Tyne and Wear Specialist Conservation Team

Specification for Preliminary Archaeological Evaluation at Land off access road to A1290, Nissan, Washington Road, Usworth

Planning Application: 09/02486/FUL

Author:

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West Chapel

Jesmond Old Cemetery

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Date: 3 September 2009

County Archaeologist's Reference Number: MON7453

The Tyne and Wear Specialist Conservation Team is the curatorial service for archaeology, industrial archaeology and historic buildings throughout the Tyne and Wear districts. It helps and advises Newcastle, Gateshead, North Tyneside, South Tyneside and Sunderland Councils to carry out their statutory duties to care for the precious historic environment of Tyneside and Wearside. The Team can be found at the Strategic Housing, Planning and Transportation Division of the Environment & Regeneration Directorate of Newcastle City Council.

Introduction

Site grid reference: NZ 340 588

Planning permission has been granted for a two storey office and teaching facility comprising of classrooms, lecture theatre, café, offices and learning resource centre. Attached to this will be a steel portal framed training facility for motor manufacturing and productivity. An

archaeological desk based assessment has been produced (North Pennines Archaeology Ltd, June 2009). The appointed archaeologist must familiarise themselves with the results of this previous archaeological work on the site before starting work.

The report concludes that the site was undeveloped until the construction of the airfield in 1916. Hylton or West Moor Airfield was a Flight Station for 'B' Flight of 36 Squadron. By 1917 it was used by 'A' Flight and was also known as Usworth. There were buildings associated with the airfield within the development site in 1934. They were probably timber buildings on brick or concrete footings. Buildings were present throughout World War Two and into the 1950s. A plan of 1945 identifies some of the buildings within the site as a fire tender garage, MT sheds, station offices and workshops.

The eastern part of the site has been landscaped. The western side is grassed with trees and also landscaped. In accordance with PPG16 and UDP Policy B14 a programme of archaeological evaluation is required to ascertain if any trace of these buildings survives.

Research Aims and Objectives

The evaluation report should make reference to Regional and Thematic Research Frameworks. The North-East Regional Research Framework for the Historic Environment (2006) notes the importance of research as a vital element of development-led archaeological work. It sets out key research priorities for all periods of the past allowing commercial contractors to demonstrate how their fieldwork relates to wider regional and national priorities for the study of archaeology and the historic environment. The aim of NERRF is to ensure that all fieldwork is carried out in a secure research context and that commercial contractors ensure that their investigations ask the right questions.

See http://www.algao.org.uk/Association/England/Regions/ResFwks.htm

Ideally and where possible the evaluation should cross-reference its aims and objectives to national priorities, defined in SHAPE (Strategic Frameworks for Historic Environment Activities and Programmes in English Heritage), and the English Heritage Research Agenda 2005-2010.

Where appropriate note any similar nationwide projects using ADS, internet search engines, ALSF website, HEEP website, OASIS, NMR excavation index. All staff on site must understand the project aims and methodologies.

Methods statement

Four evaluation trenches are needed to inform the Planning Authority of the character, nature, date, depth, degree of survival of archaeological deposits on this site. The excavation must be carried out by a suitably qualified and experienced archaeological organisation. The work will record and environmentally sample any

archaeological deposits of importance found on the plot. The purpose of this brief is to obtain tenders for this work. The report must be the definitive record for deposition in the Tyne and Wear HER, and it must contain recommendations for any further archaeological work needed on this site. The commissioning client needs to be aware that the purpose of the preliminary

evaluation is merely to ascertain if archaeological remains survive on this site and if they do, to determine their broad date, nature and function. Where archaeological remains are found in the preliminary trenches, and if these remains are at threat by the proposed development, further archaeological excavation and or a watching brief will be required before and during development work.

All staff employed by the Archaeological Contractor shall be professional field archaeologists with appropriate skills and experience to undertake work to the highest professional standards. The work will be undertaken according to English Heritage Guidelines – Managing Archaeological Projects 2nd Edition ('MAP2') 1991 (www.englishh.gov.uk/ guidance/ map2/ index.htm) and Management of Research Projects in the Historic Environment (MoRPHE) – The MoRPHE Project Managers' Guide, Project Planning Notes and Technical Guides 2006 (www.englishheritage.org.uk/publications).

The work will be undertaken according to MoRPHE Project Planning Notes 2006 - PPN3 – Archaeological Excavation and PPN6 – Development of Procedural standards and guidelines for the historic environment.

All work must be carried out in compliance with the codes of practice of the Institute of Field Archaeologists and must follow the IFA Standard and Guidance for Archaeological Field Evaluations, Excavation or Watching Briefs as appropriate. www.archaeologists.net

Notification

The County Archaeologist needs to know when archaeological fieldwork is taking place in Tyne and Wear so that he can inform the local planning authority and can visit the site to monitor the work in progress. The Archaeological Contractor must therefore inform the County Archaeologist of the start and end dates of the Evaluation. He must also keep the County Archaeologist informed as to progress on the site. The CA must be informed of the degree of archaeological survival and of any significant finds. The Client will give the County Archaeologist reasonable access to the development to undertake monitoring.

PROJECT INITIATION

PROJECT DESIGN

Because this is a detailed specification, the County Archaeologist does not require a Project Design from the appointed archaeologist. However a health and safety statement and risk assessment, identifying potential risks in a risk log (see template in appendix 2 of The MoRPHE Project Manager's Guide) and specifying suitable countermeasures and contingencies, is required to be submitted to the commissioning client.

The Management of Research Projects in the Historic Environment (MoRPHE) – The MoRPHE Project Managers' Guide 2006 contains general guidance on Risk management (section 2.3.2, Appendix 2).

Risk assessments must be produced in line with legislative requirements (for example the Health and Safety at Work Act 1974, the Management of Health and Safety at Work Regulations 1999, the Control of Substances Hazardous to Health (COSHH) Regulations 2002

and the Personal Protective Equipment at Work Regulations 2002) and best practice e.g. as set out in the SCAUM (Standing Conference on Archaeological Unit Managers) Health and Safety Manual http://www.scaum.org/uk

Detailed information on hazards and how to carry out a risk assessment can be obtained from the Health and Safety Executive (www.hse.gov.uk) and the local authority health and safety department.

Specific guidance for land contamination and archaeology can be obtained from the Institute for Archaeologists (www.archaeologists.net), the Construction Industry Research and Information Association (www.contaminated-land.org) and the Association of Geotechnical and Geoenvironmental Specialists (www.ags.org.uk). See also Environment Agency, 2005 "Guidance on Assessing the Risk Posed by Land Contamination and its Remediation on Archaeological Resource Management".

The Archaeological Contractor must be able to provide written proof that the necessary levels of Insurance Cover are in place. The Archaeological Contractor must detail measures taken to ensure the safe conduct of excavations, and must consult with the client's structural engineers concerning working in close proximity to the foundations of the surrounding buildings. The Client may wish to see copies of the Archaeological Contractor's Health and Safety Policies.

The Archaeological Contractor must maintain a Site Diary for the benefit of the Client, detailing the nature of work undertaken on a day by day basis, with full details of Site Staff present, duration of time on site, etc. and contact with third parties.

PROJECT EXECUTION

1) Archaeological evaluation

The appointed archaeological contractor will decide where best to put the trenches to avoid the most obviously landscaped parts of the site. The dimensions of the four trenches are each 1.5m x 20m in plan at base. The trenches will be located on the sites of former buildings as shown on the plan of 1945 (figure 10 in the desk based assessment).

A trench location plan will be sent to the Archaeology Officer for approval before starting work. Trench locations can be adjusted to avoid services or for practical or safety purposes. Trenches can be widened if feasible in order to step the sides to reach depths over 1.2m where necessary, otherwise shoring will be required. Trenches must avoid known services.

Trenches must stay a safe distance away from pylons and overhead power lines. The commissioning client will advise of any ecological or biodiversity issues which need to be taken into consideration. The commissioning client will advise of any protected trees which must be avoided by the evaluation. Damage to trees covered by a Tree Protection Order carries a substantial fine.

Trench positions should be accurately surveyed prior to excavation and tied in to the national grid. The trenches should be excavated to the depth natural subsoil if this can be reached safely.

Tasks

Hand excavation, recording and environmental sampling (as stipulated below) of deposits down to the depth specified above. Any modern overburden or levelling material can be machined-off using a wide toothless ditching bucket under strict archaeological supervision and the remaining deposits are to be excavated by hand. All faces of the trench that require examination or recording will be cleaned.

Excavation is to be carried out with a view to avoid damage to any archaeological features which appear to worthy of preservation in-situ. Excavation is to be carried out by single context planning and recorded on *pro-forma* context sheets. Features over 0.5 m in diameter can be half sectioned.

Environmental sampling (and where relevant scientific dating) are compulsory parts of the evaluation exercise. All tenders will give a price for the assessment, full analysis, report production and publication per environmental and scientific dating sample as a contingency.

Samples will be taken of bricks from any brick-built structures. The dimensions of the bricks and the type of bonding must be recorded. Scientific investigations should be undertaken in a manner consistent with "The Management of Archaeological Projects", English Heritage 1991 and with "Archaeological Science at PPG16 Interventions: Best Practice for Curators and Commissioning Archaeologists", English Heritage, 2003. Advice on the sampling strategy for environmental samples and samples for scientific dating etc. must be sought from Jacqui Huntley, English Heritage Regional Advisor for Archaeological Science (jacqui.huntley@english-heritage.org.uk or 07713 400387) before the evaluation begins. See Appendix 1 for more information.

See Appendix 2 for guidance on procedures relating to human remains.

See Appendix 4 for guidance on Treasure Act procedures.

The spoil can be kept close-by and rapidly backfilled into the trenches at the conclusion of this work.

Recording

A full written, drawn (accurate scale plans, elevations and section drawings) and photographic record (of all contexts in black and white print and colour transparency with clearly visible graduated metric scale) will be made. The finished report must include a plan and section of each trench (even where no archaeological remains are recorded) plus plans and sections through excavated archaeological features.

The plans will include at least two site grid points and will show section line end points.

The plans will depict building material (i.e. brick and stone) where a complex of structures has been found.

Where there is a complex of interlocking multi-phased structures, a phasing plan will also be included.

There will be elevation drawings of any standing structures such as walls.

Pro-forma context sheets will be used.

All deposits and the base of the trench will be levelled. Levels will be expressed as metres above Ordnance Datum.

Stratigraphy shall be recorded even when no archaeological features have been recognised.

A 'Harris' matrix will be compiled where stratified deposits are recorded.

2) Post-excavation and report production

Finds Processing and Storage

The Archaeological Contractor will process and catalogue the finds in accordance with Museum and Galleries Commissions Guidelines (1992) and the UKIC Conservation Guidelines, and arrange for the long term disposal of the objects on behalf of the Client. A catalogue of finds and a record of discard policies, will be lodged with the finds for ease of curation. Finds shall be recorded and processed in accordance with the IFA Guidelines for

Finds Work

Finds will be assessed by an experienced finds specialist. Human and animal bone assemblages should be assessed by a recognised specialist (see Appendices 2 and 3 for more information). Industrial slag and metal working debris will be assessed by a specialist. Assessment should include x-radiography of all iron objects (after initial screening to exclude recent debris) and a selection of non-ferrous artefacts (including all coins). Refer to "Guidelines on the x-radiography of archaeological metalwork, English Heritage, 2006.

Brick dimensions will be measured and a note made of the bonding material. If necessary, pottery sherds and bricks should be recommended for Thermoluminescence dating.

Finds processing, storage and conservation methods must be broadly in line with current practice, as exemplified by the IFA "Standard and guidance for the collection, documentation, conservation and research of archaeological materials", 2001. Finds should be appropriately packaged and stored under optimum conditions, as detailed in the RESCUE/UKIC publication "First Aid for Finds"

(Watkinson and Neal 1998). Proposals for ultimate storage of finds should follow the UKIC publication "Guidelines for the Preparation of Excavation Archives for Long-term Storage" (Walker 1990). Details of methodologies may be requested from the Archaeological Contractor.

Other useful guidance – "A Strategy for the Care and Investigation of Finds",

English Heritage, 2003, "Finds and Conservation Training Package", English Heritage, 2003.

All objects must be stored in appropriate materials and conditions to ensure minimal deterioration. Advice can be sought from Jacqui Huntley of English Heritage (07713 400387) where necessary.

PRODUCTS

The report

1. The Archaeological Contractor must produce an interim report of 200 words minimum, two weeks after the completion of the field-work, for the Client and the Planning Authority, with a copy for information to the County Archaeologist. This will contain the recommendations for any further work needed on site.

2. The production of Site Archives and Finds Analysis will be undertaken according to English Heritage Guidelines - Managing Archaeological Projects 2nd Edition ('MAP2') 1991 and Management of Research Projects in the Historic Environment (MoRPHE) 2006.

3. A full archive report or post-excavation assessment, with the following features should be produced within six months of the completion of the fieldwork. All drawn work should be to publication standard. The report must include:

* Location plans of trenches and grid reference of site

* Site narrative – interpretative, structural and stratigraphic history of the site

* Plans showing major features and deposit spreads, by phase, and section locations

* Sections of the two main trench axes and through excavated features with levels

* Elevation drawings of any walls etc. revealed during the excavation

* Artefact reports – full text, descriptions and illustrations of finds

* Tables and matrices summarising feature and artefact sequences.

* Archive descriptions of contexts, grouped by phase (not for publication)

* Deposit sequence summary (for publication/deposition)

* Colour photographs of trenches and of archaeological features and finds

* Laboratory reports and summaries of dating and environmental data, with collection methodology.

* A consideration of the results of the field-work within the wider research context (ref. NERRF).

* Recommendations for further work on site, or further analysis of finds or environmental samples

* Copy of this specification

4. Three bound and collated copies of the report need to be submitted:

• one for the commissioning client

• one for the planning authority (Sunderland City Council) – this must be formally submitted by the developer to the planning department with the appropriate fee.

• one for deposition in the County HER at the address below. A digital copy of the report on CD is also required by the HER in a plastic case. Please do not attach this to the report. The report and CD for the HER must be sent by the archaeological consultant or their client directly to the address below. If the report is sent via the planning department, every page of the report will be stamped with the planning application number which ruins the illustrations. The HER is also often sent a photocopy instead of a bound colour original which is unacceptable.

Publication

If significant archaeological features are found during the evaluation, the results may also warrant publication in a suitable archaeological journal. The tender should therefore include an estimated figure for the production of a short report of, for example 20 pages, in a journal such as Archaeologia Aeliana, the Arbeia Journal, Industrial Archaeology Review or Durham Archaeological Journal. This is merely to give the commissioning client an indication of potential costs. Before preparing a paper for publication, the archaeological contractor must discuss the scope, length and suitable journal with the County Archaeologist.

Archive Preparation and Dissemination

The archive should be a record of every aspect of an archaeological project – the aims and methods, information and objects collected, results of analysis, research, interpretation and publication. It must be as complete as possible, including all relevant documents, records, data and objects {Brown, 2007, 1}.

The site archive (records and materials recovered) should be prepared in accordance with Managing Archaeological Projects, Second Edition, 5.4 and appendix 3 (HBMC 1991), MoRPHE Project Planning Notes 2006 PPN3 – Archaeological Excavation, "Archaeological documentary archives" IFA Paper No. 1, "Archaeological Archives – creation, preparation, transfer and curation"Archaeological Archives Forum etc., Guidelines for the Preparation of Excavation Archives for Long Term Storage (UKIC 1990) and "Archaeological Archives – A guide to best practice in creation, compilation, transfer and curation" by Duncan H. Brown, Archaeological Archives Forum, July 2007.

Documentary Archive

The documentary archive comprises all records made during the archaeological project, including those in hard copy and digital form. This should include written records, indexing, ordering, quantification and checking for consistency of all original context sheets, object records, bulk find records, sample records, skeleton records, photographic records (including negatives, prints, transparencies and x-radiographs), drawing records, drawings, level books, site note-books, spot-dating records and conservation records, publication drafts, published work, publication drawings and photographs etc.

A summary account of the context record, prepared by the supervising archaeologist, should be included. All paper-based material must at all times be stored in conditions that minimise the risk of damage, deterioration, loss or theft. Do not fold documents. Do not use self-adhesive labels or adhesive or tape of any kind. High quality paper (low-acid) and permanent writing materials must be used.

Original drawings on film must be made with a hard pencil, at least 4H. Do not ink over original pencil drawings. Use polyester based film for drawings (lasts longer than plastic).

Store documents in acid-free, dust-proof cardboard boxes. Store documents flat. All documents must be marked with the project identifier (e.g. site code) and/or the museum accession number. All types of record must use a consistent terminology and format.

Use non-metal fastenings, and packaging and binding materials that ensure the longevity of documents. Copies of reports and appropriate drafts, with associated illustrative material, must be submitted for inclusion with the archive.

Material Archive

The material archive comprises all objects (artefacts, building materials or environmental remains) and associated samples of contextual materials or objects. All artefacts and ecofacts retained from the site must be packed in appropriate materials. All finds must be cleaned as appropriate to ensure their long-term survival.

All metal objects retained with the archive must be recorded by x-radiograph (except gold or lead alloys or lead alloys with a high lead content and objects too thick to be x-rayed effectively e.t.c.)

All finds must be marked or labelled with the project and context identifiers and where relevant the small-finds number. Use tie-on rot-proof labels where necessary. Bulk finds of the same material type, from the same context, may be packed together in stable paper or polythene bags. Mark all bags on the outside with site and context identifiers and the material type and include a polyethylene label marked with the same information.

Use permanent ink on bags and labels. Sensitive finds must be supported, where appropriate, on inert plastic foam or acid-free tissue paper. It is not advisable to wrap objects in tissue as the unwrapping could cause damage.

The archive will be placed in a suitable form in the appropriate museum (typically the Museum of Antiquities for Newcastle (stores in Bedson Building and at Team Valley) and Tyne and Wear Museums for the rest of Tyne and Wear (check with these institutions) with the landowner's permission. Contact Andrew Parkin at the Museum of Antiquities (0191 2228996) and Alex Croom at Tyne and Wear Museums (0191 4544093).

A letter will be sent to the County Archaeology Officer within six months of the report having been submitted, confirming where the archive has been deposited.

Digital Archive

See MoRPHE Technical Guide 1 – Digital Archiving & Digital Dissemination 2006.

SIGNPOSTING

OASIS

The Tyne and Wear County Archaeologist supports the Online Access to the Index of Archaeological Investigations (OASIS) project. This project aims to provide an online index/access to the large and growing body of archaeological grey literature, created as a result of developer-funded fieldwork.

The archaeological contractor is therefore required to register with OASIS and to complete the online OASIS form for their evaluation at http://www.oasis.ac.uk/.

Please ensure that tenders for this work takes into account the time needed to complete the form.

Once the OASIS record has been completed and signed off by the HER and NMR the information will be incorporated into the English Heritage Excavation Index, hosted online by the Archaeology Data Service.

The ultimate aim of OASIS is for an online virtual library of grey literature to be built up, linked to the index. The unit therefore has the option of uploading their grey literature report as part of their OASIS record, as a Microsoft Word document, rich text format, pdf or html format. The grey literature report will only be mounted by the ADS if both the unit and the HER give their agreement. The grey literature report will be made available through a library catalogue facility.

Please ensure that you and your client understand this procedure. If you choose to upload your grey literature report please ensure that your client agrees to this in writing to the HER at the address below.

For general enquiries about the OASIS project aims and the use of the form please contact: Mark Barratt at the National Monuments Record (tel. 01793 414600 or oasis@english-heritage.org.uk). For enquiries of a technical nature please contact: Catherine Hardman at the Archaeology Data Service (tel. 01904 433954 or oasis@ads.ahds.ac.uk). Or contact the Tyne and Wear Archaeology Officer at the address below.

The tender

Tenders for the work should contain the following:-

1. Brief details of the staff employed and their relevant experience

2. Details of any sub-contractors employed

3. A quotation of cost, broken down into the following categories:-

* Costs for the excavation, incl. sub-headings of staff costs on a person-day basis, transport, materials, and plant etc.

* Post-excavation costs, incl. storage materials

* Cost of Environmental analysis and scientific dating per sample

* Estimated cost for full publication of results in an archaeological journal

* Overheads

4. An indication of the required notification period (from agreement to start date) for the field-work; the duration of fieldwork and the expected date for completion of the post-excavation work (a maximum of 6 months after completion of the fieldwork)

Monitoring

The Archaeological Contractor will inform the County Archaeologist of the start and end dates of the excavation to enable the CA to monitor the work in progress. Should important archaeological deposits

be encountered, the County Archaeologist must be informed. If further archaeological evaluation is required on this site, then the archaeological contractor must submit a written scheme of investigation for approval by the CA before extending the size of the trenches.

APPENDICES

1 Environmental Sampling, Scientific Analysis and Scientific Dating

This is a compulsory part of the evaluation exercise. Scientific investigations should be undertaken in a manner consistent with "The Management of Archaeological Projects", English Heritage 1991 and with "Archaeological Science at PPG16 Interventions: Best Practice for Curators and Commissioning Archaeologists", English Heritage, 2003.

Aims of environmental sampling – to determine the abundance/concentration of the material within the features and how well the material is preserved, to characterise the resource (the site) and each phase, to determine the significance of the material and its group value, what crop processing activities took place on the site? What does this tell us about the nature of the site? Is there any evidence for changes in the farming practice through time? How did people use this landscape? Can we place certain activities at certain locations within the site?

Function and date of individual features such as pits, hearths etc. Are the charred assemblages the result of ritual deposition or rubbish? Is the charcoal the result of domestic or industrial fuel?

Advice on the sampling strategy for environmental samples and samples for scientific dating etc. must be sought from Jacqui Huntley, English Heritage Regional Advisor for Archaeological Science (07713 400387) before the evaluation begins. The sampling strategy should include a reasoned justification for selection of deposits for sampling.

Deposits should be sampled for retrieval and assessment of the preservation conditions and potential for analysis of biological remains (English Heritage 2002). Flotation samples and samples taken for coarse-mesh sieving from dry deposits should be processed at the time of fieldwork wherever possible. Sieving recovers fish, amphibian, small bird and mammal bone, small parts of adult mammals and young infused bones which may be under-represented otherwise. However it is noted that clay soils in this region make sieving difficult. Discuss the potential for sieving with Regional Advisor for Archaeological Science.

Environmental samples (bulk soil samples of 30-40 litres volume) will be collected by the excavator from suitable (i.e. uncontaminated) deposits. It is suggested that a large number of samples be collected during evaluation from which a selection of the most suitable (uncontaminated) can be processed. All tenders will give a price for the assessment, full analysis, report production and publication per sample. The full 30-40 litre sample must be assessed by the laboratory, not just a small sub-sample.

Deposits will be assessed for their potential for radiocarbon, archaeomagnetic (guidance is available in the Centre for Archaeology Guideline on Archaeometallurgy 2001) and Optically Stimulated Luminescence dating. Timbers will be assessed for their potential for dendrochronology dating. Sampling should follow procedures in "Dendrochronology: guidelines on producing and interpreting dendrochronological dates", Hillam, 1998. All tenders will quote the price of these techniques per sample.

The following information should be provided with the environmental samples to be processed – brief account of nature and history of the site, aims and objectives of the project, summary of archaeological results, context types and stratigraphic relationships, phase and dating information, sampling and processing methods, sample locations, preservation conditions, residuality/contamination etc.

Laboratory processing of samples shall only be undertaken if deposits are found to be reasonably well dated, or linked to recognisable features and from contexts the derivation of which can be understood with a degree of confidence.

A range of features, and all phases of activity, need to be sampled for charred plant remains and charcoal. Aceramic features should not be avoided as the plant remains from these features may help to date them. Deep features should be sampled in spits to pick up changes over time. Part, or all of each of the contexts should be processed. In general samples should be processed in their entirety. All flots should be scanned, and some of the residues.

Pollen

Pollen samples can be taken from features such as lakes, ponds, palaeochannels, estuaries, saltmarshes, mires, alluvium and colluvium, and from waterlogged layers in wells, ditches and latrines etc. Substances such as honey, beer or food residues can be detected in vessels. Activities such as threshing, crop processing and the retting of flax can be identified. When taken on site, pollen samples should overlap. Your regional science advisor can advise on the type of corer or auger which would be most appropriate for your site. Samples need to be wrapped in clingfilm and kept dark and cool. Make a description of the sediments in which the pollen was found, and send this with the sample to be assessed.

Forams and diatoms

Coastal or estuary sites (even those which are now well drained) are suitable for sampling for foraminifera. Diatoms can also be found on marine sites, but also in urban settings (sewers, wells, drains, ditches etc). They only survive in waterlogged conditions. These aquatic microfossils are used as proxy indicators of the former aquatic ecological conditions on site, changes in sea levels and temperature, salinity, PH and pollution. Forams are taken from cores, monolith tins or bulk samples. Diatoms are cut from monolith tins or cores or taken as spot

samples.

Insects

Insects, which are useful as palaeoenvironmental indicators, survive best in waterlogged deposits such as palaeochannels and wells. They can provide information on climate change and landscape reconstruction as some species are adapted to particular temperatures, habitats or even particular trees. Certain insects can indicate the function of a feature or building (eg. Weevils, which were introduced by the Romans, often indicate granary sites, parasites will indicate the presence of particular animals such as sheep or horse, latrine flies survive in the

mineral deposits in latrines, or in the daub of medieval buildings etc). Samples need to be sealed (eg. in a plastic box).

Industrial Activity

Where there is evidence for industrial activity, macroscopic technological residues should be collected by hand. Separate samples should be collected for microslags (hammer-scale and spherical droplets). Guidance should be sought from the English Heritage Regional Science Adviser on the sampling strategy for metalworking features and advice on cleaning and packaging. Specialist on-site advice must be sought on identification of metalworking features. Slag and metal working debris must be assessed by a specialist. Scientific analysis (such as x-ray fluorescence, chemical analysis, metallography or scanning electron microscope) of slag can provide information on the melting temperature, chemical composition (is it iron, zinc, copper etc), microstructure (the type and shape of the crystals), physical properties (the hardness or viscosity), isotopic composition (strontium_87 or strontium_88 etc) and mineralogical composition. Guidance is available in the English Heritage "Archaeometallurgy" guidelines, 2001; "Archaeomagnetic dating", 2006 and "Guidelines on the X-radiography of archaeological metalwork", 2006. See also Historical Metallurgy Society, 2008, "Metals and metalworking: a research framework for archaeometallurgy".

Buried soils and sediments

Buried soils and sediment sequences should be inspected and recorded on site by a recognised geoarchaeologist. Procedures and techniques in the English Heritage document "Environmental Archaeology", 2002 and "Geoarchaeology", 2004 should be followed.

Wood

Sampling strategies for wooden structures should follow the methodologies presented in "Waterlogged wood. Guidelines on the recording, sampling, conservation and curation of waterlogged wood" R. Brunning, 1996. If timbers are likely to be present on your site, contact a wood specialist beforehand. Preexcavation planning – determine questions to ask, agree on a sampling strategy, allocate reasonable time and budget. Soil samples should be taken of the sediments surrounding the timber. Keep the timbers wet! Record them asap onsite – plan, photograph, record the size and orientation of the wood (radial, tangential,transverse), any toolmarks, joints, presence of bark, insect damage, recent breaks, and if another piece of wood was on top of or below the piece sampled. Both vertical and horizontal positioning of wattling must be recorded. Wood samples can provide information on woodland management such as medieval coppicing, type of taxa (native or foreign), conversion technology (how the wood was turned into planks), building techniques and type of tools used. Suitable samples should be submitted for dendrochronological dating. See English Heritage guidelines, 2004, "Dendrochronology".

Leather and organic materials

Waterlogged organic materials should be dealt with following recommendations in "Guidelines for the care of waterlogged archaeological leather", English Heritage and Archaeological Leather Group 1995.

2 Animal Bone

Animal bone can explore themes such as hunting and fowling, fishing, plant use, trade network, seasonality, diet, butchery, animal husbandry, food procurement, age structures, farrowing areas, species ratios, local environment. Domestic animal bone was used in prehistoric and Roman cremation rituals. Post medieval cattle bones – small cow bones invariably represent animals which produced high quality buttermilk for cheese. Big 'improved' cattle with large bones were produced for large quantities of meat and poorer quality milk. Large and small cattle bones are often found together on post medieval sites, usually with less of the small bones.

Animal bone assemblages should be assessed by a recognised specialist. The specialist will need to know a brief account of the nature and history of the site, an account of the purpose, methods (details of sampling) for recovery of animal bones, and the main aims and results of the excavation, details of any specific questions that the excavator wants the animal bone specialist to consider, information about other relevant finds from the excavation (e.g. bone tools, fishing equipment, weaving equipment), specific information about each context that has produced significant quantities of animal bone (recovery method, phase, context type, position in relation to major structures, contamination by more recent material, some indication of the amount of bone (by weight or by container size). See "Ancient Monuments Laboratory Advisory Note, "Assessment of animal bone collections from excavations", Sebastian Payne, 1991and "The Assessment of a collection of animal bones", S. Davis, n.d., Ancient Monuments Laboratory.

Fish bone – there was some herring exploitation in the early medieval period. Christian fasting from around 970 allowed fish to be eaten on Fridays which led to a huge demand for fish. There was an increase in marine fishing, fish trade and fish consumption (cod, haddock, ling, herring etc) around 1000 AD. Middens provide evidence of commercial fishing. There was a decline in freshwater fish (cyprinid or carp, salmon, smelt, eel, pike) from the eleventh century.

Smoking fish is a recent practice. They were previously air dried and salted. Newcastle was a major port. Samples should be sieved to retrieve fish and bird bones along with small parts of other animal skeletons and young infused bones. A crane bone was recovered from excavations at Tuthill Stairs, Newcastle – a rare find. Herring bones are so small that they can only be retrieved by 2mm sieving. Clay soils are difficult to sieve, hot water can help. Acidic soils mean poor preservation of bone.

See English Heritage 2002, "Environmental Archaeology – a guide to the theory and practice of methods from sampling and recovery to post excavation", Centre of Archaeology Guideline 1. Isotope analysis can determine where the fish were coming from – North Sea, Scandinavia, Newfoundland, Iceland etc.

There is an excellent reference collection of fish bone at York. Fish bones should be archived to museums for future dating and isotope analysis where this is not undertaken as part of the post-excavation process.

www.fishlab.org

3 Human Remains

Human remains must be treated with care, dignity and respect. Excavators must comply with the relevant legislation (essentially the Burial Act 1857) and local environmental health concerns. If found, human remains must be left in-situ, covered and protected. The archaeological contractor will be responsible for informing the police, coroner, local Environmental Health department and the County Archaeologist. If it is agreed that removal of the remains is essential, the archaeological contractor will apply for a licence from the Home Office and their regulations must be complied with.

Site inspection by a recognised osteologist is desirable for isolated burials and essential for cemeteries. The remains will be recorded in-situ and subsequently lifted, washed in water (without additives). They will be marked and packed to standards compatible with "Excavation and post-excavation treatment of cremated and inhumed human remains", McKinley and Roberts, 1993. After excavation, the remains will be subject to specialist assessment. Analysis of the osteological material should take place according to published guidelines "Human Remains from Archaeological Sites, Guidelines for producing assessment documents and analytical reports, English Heritage, 2002.

Some of the potential benefits from the study of human skeletons – demography, growth profiles, patterns of disease, genetic relationships, activity patterns, diet, burial practices, human evolution. New scientific techniques available include DNA and stable isotope analyses.

Diseases which yield ancient DNA – leprosy, syphilis, tuberculosis, mycobacterium bovis (animal form of TB passed to humans when they shared a living space from Neolithic period onwards). Cremation destroys the crown of the tooth so it cannot be dated (the closure of the cranium vault can be used in adults for dating instead). Cremation also fragments bone, distorts it due to lack of water, shrinks the bone, causes microstructural alteration and destroys organic components (so DNA analysis not possible).

The final placing of the remains after scientific study and analysis will be agreed beforehand.

Further guidance is available in:

"Guidance for best practice for treatment of human remains excavated from

Christian burial grounds in England", The Church of England and English Heritage, 2005 (www.english-heritage.org.uk/upload/pdf/16602_HumanRemains1.pdf)

"Church Archaeology: its care and management", Council for the Care of Churches, 1999

The Advisory Panel on the Archaeology of Christian burials in England can provide free well-informed advice with consideration of relevant religious, ethical, legal, archaeological and scientific issues. Panel's website:

http://www.britarch.ac.uk/churches/humanremains/index.html

or email the secretary simon.mays@english-heritage.org.uk

4 Treasure

Defined as:

• Any metallic object, other than a coin, provided that at least 10% by weight of metal is precious metal and that is at least 300 years old when found

• Any group of two or more metallic objects of any composition of prehistoric date that come from the same find

• All coins from the same find provided that they are at least 300 years old when found, but if the coins contain less than 10% gold or silver there must be at least ten

• Any object, whatever it is made of, that is found in the same place as, or had previously been together with, another object that is Treasure

• Any object that would previously have been treasure trove, but does not fall within the specific categories given above. Only objects that are less than 300 years old, that are made substantially of gold or silver, that have been deliberately hidden with the intention of recovery and whose owners or heirs are unknown will come into this category

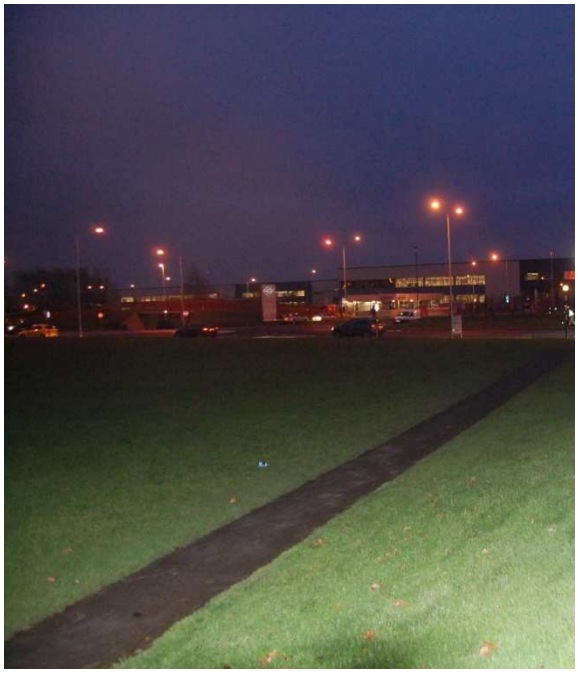
If anything is found which could be Treasure, under the Treasure Act 1996, it is a legal requirement to report it to the local coroner within 14 days of discovery. The Archaeological Contractor must comply with the procedures set out in The Treasure Act 1996. Any treasure must be reported to the coroner and to The Portable Antiquities Scheme Finds Liaison Officer, Rob Collins (0191 2225076 or Robert.Collins@newcastle.ac.uk) who can provide guidance on the Treasure Act procedures.

If you need this information in another format or language, please contact

Jennifer Morrison, Archaeology Officer.

APPENDIX 3: FIGURES

ACCESS ROAD TO A1290, NISSAN WORKS, WASHINGTON ROAD, USWORTH, TYNE AND WEAR



PRELIMINARY EVALUATION REPORT

CP. NO: 1016/09

16/12/2009

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DOCUMENT TITLE:	Land off Access Road to A1290, Nissan Works, Washington Road, Usworth
DOCUMENT TYPE:	Preliminary Evaluation Report
CLIENT:	MDA Consulting Limited
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Quality Assurance

This report covers works as outlined in the brief for the above-named project as issued by the relevant authority, and as outlined in the agreed programme of works. Any deviation to the programme of works has been agreed by all parties. The works have been carried out according to the guidelines set out in the Institute for Archaeologists (IfA) Standards, Policy Statements and Codes of Conduct. The report has been prepared in keeping with the guidance set out by North Pennines Archaeology Ltd on the preparation of reports.

REVISION SCHEDULE			
	01	**02**	**03**
PREPARED BY: **POSITION:** **DATE:**	Tony Liddell Supervisor 16/12/2009		
EDITED BY: **POSITION:** **DATE:**	Martin Railton Project Manager 16/12/2009		
APPROVED BY: **POSITION:** **DATE:**	Frank Giecco Principal Archaeologist 16/12/2009		

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SUMMARY

In December 2009, North Pennines Archaeology Limited undertook an archaeological evaluation on land off the A1290 by the Nissan Works at Washington, Sunderland, Tyne and Wear (NGR: NZ 340 588). This was at the request of MDA Developments Ltd, and was in advance of the submission of a planning application for a sustainable manufacturing centre by Gateshead College (Planning Application 09/02486/FUL).

The town of Washington is situated approximately 9km to the west of Sunderland, on the north side of the River Wear. The Nissan factory is located between Sunderland and Washington, on the west side of the A19 and to the north of the A1231, and the development site is directly north of the factory. The development site lies within an area formerly occupied by an airfield constructed in 1916. Hylton or West Moor Airfield was a Flight Station for 'B' Flight of 36 Squadron. In 1917, the airfield was renamed 'Usworth' and was used by 'A' Flight. Previous archaeological research into the site revealed that there were still buildings associated with this early airfield in 1934, with further buildings present throughout the Second World War and into the 1950s. In accordance with PPG16 and UDP Policy B14 a programme of archaeological evaluation was required to ascertain if any trace of these buildings survive.

The field evaluation consisted of four trial trenches, located to target specific remains of buildings from the First World War airfield: the Main Stores, Motor Transport Sheds and Office and the Workshops.

The trenching revealed a relatively uniform stratigraphy, with natural clay underlying all trenches at an average height of 32.83mOD. All trenches contained a modern 20th century deposit overlying the natural substrate, the top of which averaged a datum height of 33.14m. This deposit indicates the level taken during the clearance of the site with any remains of the airfield buildings removed to this depth or below. This deposit also represents the depth of overburden stripped to during the building of the Nissan Works, when the development site was used as a storage and work area: this is demonstrated by the modern crushed hardcore observed in both Trenches C and D. Trench C also showed the use of hardcore to create the landscaped bunds in the northern extent of the site, indicating that the bunds are simply landscape features rather than the remains of earlier airfield buildings.

In Trench A, a concrete drain was uncovered in the northeast corner of the trench set within the modern backfill. While this could be a remnant of the drainage system from the airfield, it is more likely to be part of a drainage system set up while the area was used as a working compound for the construction of the Nissan Works. Trench B revealed a highly truncated concrete wall footing, which bears no relation to the potential remains of the Main Stores which the trench was targeting. However, the alignment does match with the edge of the road to the east of the building, perhaps indicating that the lowest remains of the road edging still remain *in-situ*.

Overall, the trenching revealed that no remnants of the buildings targeted remain in the evaluation area, with concrete footing remains minimal at best, with the majority removed during the 1980s when the area was used as a compound during the construction of the Nissan Works to the south.

The North-East Regional Research Framework 'Shared Visions' notes that there are relatively few World War I remains in the north-east.. The Research Agenda and Strategy in this publication notes that 'remains relating to the First World War must be recorded, and that full recording is necessary of all 20th century military and defence remains where they are affected by development work'. While it is clear from the previous deskbased assessment that the development area was in use during the First and Second World Wars, the remains of the buildings from that period have been destroyed and removed during the 1980s.

ACKNOWLEDGEMENTS

North Pennines Archaeology Ltd would like to thank MDA Development Ltd for commissioning the project.

NPA Ltd would also like to thank Jennifer Morrison, Archaeology Officer for Newcastle City Council, for all her help and assistance throughout the project.

The archaeological evaluation was undertaken by Tony Liddell and Michael McElligott, with the help of machine-driver John Thralkeld. The trenches were surveyed by Matthew Town and Helen Noakes. The report was written and the drawings produced by Tony Liddell. The project was managed by Frank Giecco, Technical Director for NPA Ltd. The report was edited by Martin Railton, Project Manager for NPA Ltd.

1 INTRODUCTION

1.1 CIRCUMSTANCES OF THE PROJECT

1.1.1 In December 2009, North Pennines Archaeology Limited undertook an archaeological evaluation on land off the A1290 by the Nissan Works at Washington, Sunderland, Tyne and Wear College ([NGR: NZ 340 588]; Figure 1). This was at the request of MDA Developments Ltd, and was in advance of the submission of a planning application for a sustainable manufacturing centre by Gateshead.

1.1.2 The town of Washington is situated approximately 9km to the west of Sunderland, on the north side of the River Wear. The Nissan factory is located between Sunderland and Washington, on the west side of the A19 and to the north of the A1231, and the development site is directly north of the factory.

1.1.3 The development site lies within an area formerly occupied by an airfield constructed in 1916. Hylton or West Moor Airfield was a Flight Station for 'B' Flight of 36 Squadron. In 1917, the airfield was renamed 'Usworth' and was used by 'A' Flight. Previous archaeological research into the site revealed that there were still buildings associated with this early airfield in 1934, with further buildings present throughout the Second World War and into the 1950s (Wooler 2009). In accordance with PPG16 and UDP Policy B14 a programme of archaeological evaluation was required to ascertain if any trace of these buildings survive.

1.1.4 This report sets out the results of the work in the form of a short document outlining the findings, followed by a statement of the archaeological potential of the area, an assessment of the impact of the proposed development, and recommendations for further work.

2 METHODOLOGY

2.1 ARCHAEOLOGICAL BRIEF

2.1.1 A *Specification for Preliminary Archaeological Evaluation at Land off access road to A1290, Nissan, Washington Road, Usworth* (Morrison 2009) was produced by Newcastle City Council and a subsequent trench location plan submitted by North Pennines Archaeology Limited on behalf of the client, MDA Developments Limited, for an archaeological evaluation of the development area. The specification and trench location was agreed upon in consultation with the Archaeology Officer for Newcastle City Council.

2.1.2 Following acceptance of the trench location plan by Newcastle City Council, North Pennines Archaeology Ltd was commissioned by MDA Developments Ltd to undertake the work. The specification and trench location plan was adhered to in full, and the work was consistent with the relevant standards and procedures of the Institute for Archaeologists (IfA), and generally accepted best practice.

2.2 ARCHAEOLOGICAL EVALUATION

2.2.1 The field evaluation consisted of four trial trenches, with Trench A measuring 10.0m in length by 1.60m in width, and Trenches B-D 5.0m in length by 3.0m in width. The trenches were located to target specific remains of buildings from the Second World War airfield: the Main Stores, Motor Transport Sheds and Office and the Workshops.

2.2.2 The location and size of the trial trenches were agreed by consultation between North Pennines Archaeology Ltd and Jennifer Morrison, Archaeology Officer for Newcastle City Council.

2.2.3 The aims of the evaluation can be summarised as follows:

- to establish the presence/absence, nature, extent and state of preservation of archaeological remains and to record these where they are observed;
- to establish the character of those features in terms of cuts, soil matrices and interfaces;
- to recover artefactual material, especially that useful for dating purposes;
- to recover palaeoenvironmental material where it survives in order to understand site and landscape formation processes.

2.3 METHODOLOGY

2.3.1 The trenches were located using Trimble Zeiss 3601 Total Station survey using coordinates from the trench location plan.

2.3.2 The trenches were excavated by a mechanical excavator equipped with a toothless 1.6m wide ditching bucket, under archaeological supervision, to the top of the natural substrate. Each trench was then manually cleaned and any putative archaeological features investigated and recorded according to the North Pennines Archaeology Ltd standard procedure as set out in the NPA Excavation Manual (Giecco 2003).

2.3.3 A photographic record was made using digital photography, 400 ISO Black and White print and 200 ISO Colour Slide film.

2.3.4 All work was undertaken in accordance with the Institute for Archaeologists Standards and Guidance for Archaeological Field Evaluations (IfA 2008).

2.4 THE ARCHIVE

2.4.1 A full professional archive has been compiled in accordance with the specification, and in line with current UKIC (1990) and English Heritage Guidelines (1991) and according to the Archaeological Archives Forum recommendations (Brown 2007). The archive, including the physical and paper archive and copies of the report, will be sent to Tullie House, Carlisle, and will be made available upon request. The archive can be accessed under the unique project identifier NPA09, GCN-A, CP 1016/09.

2.4.2 North Pennines Archaeology supports the **O**nline **A**cces**S** to the **I**ndex of Archaeological Investigation**S** (**OASIS**) project. This project aims to provide an on-line index and access to the extensive and expanding body of grey literature, created as a result of developer-funded archaeological work. As a result, details of the results of this project will be made available by North Pennines Archaeology, and can be accessed under the unique identification number *northpen3- 69355*.

3 BACKGROUND

3.1 LOCATION AND GEOLOGICAL CONTEXT

3.1.1 The city of Sunderland is located in the north-east of England, approximately 16km to the south-east of Newcastle upon Tyne and c.14km to the north-east of Durham. The town of Washington is situated approximately 9km to the west of Sunderland, on the north side of the River Wear. The Nissan factory is located between Sunderland and Washington, on the west side of the A19 and to the north of the A1231.

3.1.2 The topography of the area in and around Sunderland is determined by the geological structure. The strata found in the area are carboniferous coal measures and deposited Permian limestone overlay by glacial drift and alluvium. This limestone overlay rises in a more or less gentle slope under its blanket of glacial drift from the coast to a western escarpment about 500ft above sea level (Countryside Commission 1998).

3.2 HISTORICAL CONTEXT

3.2.1 *Introduction:* this historical background is compiled from the Desk Based Assessment (Wooler 2009) and is intended only as a summary of historical developments specific to the study area.

3.2.2 The place name Usworth is thought to stem from the Old English "burn by Osa's road".

3.2.3 ***Prehistoric Period (pre c.AD 43)***: no prehistoric activity located close to the proposed development area was noted in material consulted for the Desk Based Assessment. The Archaeological Data Service, however, contains an entry in its online catalogue for a possible prehistoric or Roman rectilinear site within an oval enclosure at grid reference NZ 333 90, to the north-west of Usworth airfield, between the Three Horse Shoes and North Moor Farm.

3.2.4 In the nearby vicinity, evidence for human settlement and activity in the Hylton area comes largely from findspots. In 1885 a dug-out canoe was found in the bed of the River Wear at Hylton. A second similar canoe was already known to Sunderland Museum as they had in their collection a photograph showing a fragmentary example. This canoe was believed to have been dredged from the River Wear between Hylton Dene and Southwick. The two canoes are suggested to have dated to the late Bronze Age or the Iron Age. Other prehistoric finds within the locality of Hylton include a bronze socketed axe from the Wear and two late Bronze Age swords from the Wear at Ford. The axe and two swords (which are of the Park Ewart type) are considered to be c.900-700BC.

3.2.5 In the wider landscape, prehistoric activity is evidenced by Bronze Age burials at Humbleton Hill and Hastings Hill, and Mesolithic and Neolithic flints and arrowheads have been found at Grindon, all on the south side the River Wear. Mesolithic to late Bronze/early Iron Age occupation have been discovered at Bishopwearmouth, also on the south side of the Wear, and prehistoric burials and enclosures are known at Fulwell and Carley Hill on the north side of the river, and to the east of Hylton.

3.2.6 ***Romano-British Period (c.AD 43-400)***: in 1939, a hoard of Roman coins were found at Washington Station. The hoard contained 59 coins including one minted during the reign of Emperor Constantine (possibly 4th century AD). There is no evidence as yet for activity during this period in close proximity to the proposed development area although the cropmarks already referred to may date to this period. It has been mentioned by Mr Fulton at the North East Aircraft Museum, that 'Roman remains' were found during preparatory work for the construction of the Nissan plant on the former airfield. No written confirmation of this has, however, been found during the desk-based assessment.

3.2.7 The main evidence for occupation of the area around Sunderland during this period is in the form of burials and coins. In 1759 a cist containing a large skeleton was uncovered at Fulwell during limestone quarrying. Two coins dating from the beginning of the 3rd century were found close by. To the north, near the Carley Hill quarry, a bronze figurine of Jupiter Dolichenus, a Romano-British god, was discovered in 1820. In 1971 the hill also yielded two Roman coins dating from the 2nd to the 3rd centuries. To the west at Southwick quarry, pieces of Roman pottery, including the remains of a late 4th century cooling pot were found in 1927. Coins from the period have also been found at and around Hylton, as well as a possible Roman milestone inscribed with a dedication to the Emperor Gordian (AD 238-44) found in the Wear and recorded by the prominent antiquarian, Robert Surtees, although its exact find spot is unknown.

3.2.8 ***Early Medieval Period (c.AD 400-1066)***: the only evidence for activity or settlement during this period comes from place names, as already referred to in 3.2.2 above. What is now known as Tyne and Wear was certainly an important area during this period as show by early Christian sites such as Jarrow (HER 1227), Tynemouth (HER 124-9) and Monkwearmouth which was founded by Bishop Bishop in 674AD (HER 87). There is no evidence of activity during this period in close proximity to the proposed development area, although as with earlier periods this does not mean a total absence of settlement or land use.

3.2.9 ***Medieval Period (c.AD 1066-1485)***: there is no evidence of medieval activity in the vicinity of the proposed development area. It is possible that the land may have been on the edges of Hylton Castle estate, and may have been waste, common or agricultural in nature.

3.2.10 Hylton Castle, located to the east of the proposed development area and now surrounded by housing, was built by Sir William Hylton as a gatehouse style fortified manor house. Although no construction records survive, the style of the architecture and coats of arms on the west front mean that it dates to the 1390s or the first decade of the 1400s. Other buildings may have existed on the site at this time, as the inventory taken on Sir William's death in 1435 mentions a hall, four chambers, two barns, a kitchen and the chapel in addition to the castle. Early in the 18th century, Baron John Hylton made the first major alterations. He completely redesigned the interior and inserted large windows in the fashionable Italianate style. His son, John, made even greater alterations. He built a south wing and added crenallations to both wings. When he died in 1746, the Hyltons sold the castle, as there was no male heir to inherit it. Successive owners failed to maintain it, and in 1863 it was bought by William Briggs, who knocked down the north and south wings, gutted the interior and added new windows. The chapel at Hylton Castle, dedicated to St Catherine, is known to have existed on the site since 1157, when it was likely that Hylton Castle was a wooden building. Nothing remains of the first chapel and the ruins seen today date from the early 15th century.

3.2.11 Like the rest of Monkwearmouth parish, Hylton had presumably been part of the lands of the Anglian monastery, but after the Norman Conquest it did not pass with the other townships to the priory's monastic cell. From the 12th century, and perhaps earlier, the manor and township of Hylton belonged to the Hilton family who took their name from the estate. There is evidence that there was a mill at Hylton by the late 12th century, although its precise location if unknown. If it was a watermill if may have stood at Hylton Dene. In later centuries a windmill was sited to the north of the castle.

3.2.12 ***Post-Medieval Period (c.AD 1485-1900)***: writing in 1967, Bennett refers to the 'Blackwood' located beside Usworth Aerodrome, as providing some idea of what the countryside was like in the area before any clearance was undertaken, although the exact location of the 'Blackwood' does not appear to be shown on any historical mapping. He noted that the land between Biddick Forest and the Three Horse Shoes was drained in 1820. Oak was mainly grown in Biddick Forest, and for centuries it was exported from Sunderland port, providing a considerable trade in hardwood as well as coal.

3.2.13 Nearby Hylton Castle was the site of skirmishes during the Civil War in the middle of the 17th century. Corfe noted that these skirmishes took place on high ground to the north of the castle in 1644.

3.2.14 Industries along the Wear appear to have been well established by the early 19th century. Parson and White refer to industry at Southwick (1¼ miles north-west of Sunderland and to the east of Hylton) on the north bank of the river, which included several shipyards, lime-kilns and earthenware and glass manufactories. The trade directory in Parson and White lists the trades in the township of Hylton in 1828, these appear to be more agricultural in nature rather than industrial, apart from Auston Dixon & Co, earthenware manufacturers at Hylton Ferry and Robert Reay, shipbuilder and timber merchant at the same location. Farms such as Cow Stand (occupied by Marmaduke Robinson), West Moor (Thomas Reed) and South Moor (George and James Curry), all previously located within close proximity to the proposed development area, were all in existence at this date. The Three Horse Shoes is listed as occupied by John Merriman, victualler and blacksmith, at 'Road Stone' in Hylton township; this may be an earlier name for the site although it is not shown on later mapping. North Hylton appears to have been more industrial than the rest of the township, no doubt due to its proximity to the river. Brett refers to industries such as iron ore (on land close to the ship building yards); charcoal; lamp black; grindstones and whetstones (North Hylton had quarries that yielded grindstones in the 17th and 18th centuries) which were exported all around the world; sandstone quarried from sites such as Wood House at North Hylton; tar; a pottery had been established at North Hylton in 1762 by the Maling family. The Malings had been Huguenot refugees who settle in Scarborough before moving to Sunderland. Rich clay beds and the riverside location for east of transport on the Wood House estate made it an ideal site for a pottery. The outbreak of the Crimean War in 1854 signaled an upturn in industry in North Hylton. The old pottery building was turned into a forge and iron works and shipbuilding yards sprang up on vacant lots on the riverside.

3.2.15 With reference to Hylton Colliery (or Castletown Colliery), Brett noted that the Wearmouth Coal Company bought the Wear Steel Works, 36 acres of land and 190 workmen's cottage for £37 000. The company began work on sinking the first shaft in March 1897. In October 1900 the mine was still being developed but was still producing 500 tons of coal a day. Output almost doubled when Hylton was at its peak and the workforce topped the 1000 mark. In 1907 the coal company bought the whole of the 2000 acres Hylton Castle Estate including the castle. As they already owned the coal rights the purchase was made as an investment. In the late 1970s Hylton was one of a number of small Durham collieries which ceased mining coal, the

pit finally closed in July 1979. The colliery at Hylton (located approximately 2km to the south-east of the proposed development area) was not the only colliery site in the area; Usworth Colliery is shown on the Ordnance Survey map of 1921 (HER No. 365) and a colliery also existed at Boldon to the north which opened in 1862 and closed in 1982 (HER No. 2567). There does not appear to have been any collieries within close proximity to the proposed development area.

3.2.16 The mining of coal was greatly aided by the railways. The colliery at Usworth (NZ 315 584) was served by sidings alongside what became the North Eastern Railway line from Washington to Pelaw, ½ mile north of Usworth Station. Prior to the first locomotives, trucks on these sidings were almost certainly shunted by horses33. The Pontop and South Shields Branch of the North Eastern Railway was originally the Stanhope and Tyne Railway which opened in 1834 as the first public railway on Tyneside. It carried minerals from County Durham to the Tyne and passengers from South Shields to the Durham Turnpike (HER No. 2290). The Hylton, Southwick and Monkwearmouth Railway was formed in 1871 to develop industry on the north bank of the Tyne. It opened in 1876 between the NER line at Monkwearmouth and the NER's Tyne Dock-Consett line at Southwick Junction, although the latter connection was removed shortly after. Both the Pontop and South Shields Branch of the NER and the Hylton, Southwick and Monkwearmouth branch line are located to the west and the south of the proposed development site respectively. There was no evidence that any railway lines or associated features crossed the proposed development area.

3.2.17 ***Modern (1900-Present)***: the industrial nature of the area around Sunderland, such as shipbuilding and coal mining, meant that the town and its hinterland were obvious German targets during the First World War. In April 1916, for example, a Zeppelin passed over Seaham harbour and crossed over the colliery villages towards Washington. Fourteen explosive bombs and seven incendiary bombs were dropped within five minutes. The first bomb in Sunderland landed in a yard in Peacock Street. The Zeppelin then made its way towards Monkwearmouth goods yard, hitting North Bridge Street, the tramway sheds and the Workmen's Hall (Calvert Street). The greatest amount of damage was done to Fern Street, North Bridge Street and Victor Street.

3.2.18 As a consequence of Zeppelin raids on the area around Sunderland, an airfield was created outside the town in October 1916 as a Station for 'B' Flight of No. 36 Squadron. It was originally known as Hylton, although when it was being prepared it was known as West Town Moor. Due to the increase in German bombing, the Royal Flying Corps undertook the task of Home Defence, setting up a number of squadrons, with flights spread over

the length of the British coastline. The north-east was protected by No. 36 Home Defence Squadron, which was formed by Capt. R O Abercromby at Cramlington in February 1916. No. 36 Home Defence Squadron defended the coast between Whitby and Newcastle. The main base was at Cramlington, to the north of Newcastle, with flights being attached to Seaton Carew and Ashington, as well as Hylton. By August 1918 Hylton was in use by 'A' Flight and continued as such until the Armistice, when it was just beginning to become known as Usworth.

3.2.19 Following the end of the First World War, Usworth airfield reverted to non-flying use, as was the case with many First World War aerodromes. Usworth languished unused for over a decade, apart from at least one visit by Alan Cobham's Flying Circus, until it was re-activated on March 17th 1930. From this period, the flying field was located to the south side of the road between Washington and Sunderland, and ancillary buildings were located to the north. The airfield was designed to accommodate one squadron of the recently expanded Royal Auxiliary Air Force, No. 607 (County of Durham) Squadron. North Camp was provided with living quarters and dining facilities for Officers, NCOs and airmen. It was initially proposed to erect canvas Besoneaux Hangars on the South Camp, however these were rejected in favour of the erection of a large Lamella Hangar. The South Camp also housed the Squadron Office, pilot huts, armoury, photographic hut and bombing training aids. The firing butts were alongside the railway. On 24th 1934, the airfield was opened to the public on Empire Air Day; this attracted 1300 visitors with an estimated 5000 other spectators watching the flying displays form outside the airfield. Proceeds from the Empire Air Day went to the RAF Benevolent Fund. The Empire Air Day in 1937, as well as having flying demonstrations and aerobatics, also included the erection of a dummy fort near the southern perimeter of the airfield, which was the subject of 'attacks' by the Hinds of 103 Squadron with the Demons of No. 607 Squadron 'defending'.

3.2.20 In September 1939 work commenced on the laying of two concrete runways, as well as the expansion of the airfield to the south, east and west by taking in adjoining fields. The new 2800 feet (c.900m) long runway was laid northwest to south-east, with another of similar length on a north-south heading. A new perimeter track was laid out along the airfield boundary with eight dispersal pens, each capable of holding a twin-engined aircraft. There were also 34 hard standings for single-engined fighters. Three of the older Callender Hangers were dismantled, leaving the Lamella and a single Callender hangar opposite the main gate. Additional buildings were constructed between the airfield and the road. An Operations Room was built near the Lamella hangar; this was later supplemented by an

underground Battle Headquarters near the Cow Stand Farm corner of the airfield. On the North Camp side new accommodation blocks were erected for the expected large influx of personnel which included WAAFs. On both sides of the road numerous air raid shelters were constructed. To assist in the defence of the airfield a series of dispersed sites were set up over a wide area around the site; these included a searchlight camp at the top of Ferryboat Lane and small gunposts on the Birtley Road, above the old quarries at the bottom end of Boldon Bank and along the disused railway line towards North Hylton. At Downhill Farm a large gun site was set up, and a decontamination centre was constructed well away from the airfield. During the Second World War, a watch tower was constructed on stilts on the roof of the Three Horse Shoes; the pub also acted as a Mess for Officers during this period.

3.2.21 In the publication *Archaeology of the Twentieth Century Defence Sites of Tyne and Wear: An Illustrated Guide*, several sites in and around the airfield at Usworth are listed. Of particular interest are the Pickett-Hamilton Forts, which were a form of pillbox unique to airfields, and which were often placed down the very centre of the runway. Pickett-Hamilton Forts were sunken, circular reinforced concrete pillboxes which remained flush with the airfields surface to permit the free movement of aircraft. If there was a threat of attack, however, the forts would be raised by a hand operated hydraulic jack and manned with guns.

3.2.22 Sunderland and its surrounding area did not escape bombing during the Second World War. The first bombs dropped on the district fell soon after midnight on the 22nd June 1940. Areas affected included buildings at the Old Rectory at Whitburn, a field near Church Lane and The Bents, and the Fishermen's Cottages, which narrowly escaped being demolished. An incendiary bomb fell onto Hylton Dene, 100 yards from Hylton Colliery, Castletown.

3.2.23 The airfield at Usworth had the distinction of being singled out for a major Luftwaffe attack during the Battle of Britain. On August 15th 1940, German aircraft were detected approaching the east coast of Britain. Spitfires from 72 Squadron Ackington met them off the Farne Islands, and although heavily outnumbered, several German aircraft were destroyed. The German formation then split in two, one portion making for Tyneside, while the other turned south. The Second Acklington Squadron, No. 79, encountered the northern group just off the coast and a wild dog-fight ensued. Reforming, the Hurricanes caught up with the bombers approaching Newcastle, where their primary objective would appear to have been Usworth. Harried by the Tyne guns and by more Hurricanes from Drem in

Scotland, the German 'Heinkels' made off, scattering their bombs with little effect, and leaving Usworth untouched.

3.2.24 For much of the Second World War, Usworth was used for training, with pilots of several nations stationed there, including Polish, Czech, Canadian, Australians, Americans and New Zealanders. The training of new pilots up to operational status was a hazardous activity with many aircraft damaged or destroyed during this period. Many of these pilots have their last resting place in Castletown cemetery near the airfield.

3.2.26 Following the end of the Second World War, Usworth was home to No. 31 Gliding School which had formed around 1944. The role of the Gliding School was to provide elementary flying training to cadets of the Air Training Corps from local squadrons in the north-east. In 1951 control of Usworth passed to No. 2 Basic Air Navigation School which disbanded in 1953 when control passed to Durham University Air Squadron. In 1958 the Gliding School, the University Air Squadron and the G.C.I aircraft were moved to RAF Ouston as Usworth was to close, although some limited use of the site was made by the Territorial Army for parachute training from tethered balloons. On 3rd July 1962, Usworth was bought by Sunderland Corporation for £27, 000 and reopened as Sunderland Airport.

3.2.27 Sunderland Corporation re-laid the runways and renovated the hangar, and in June 1963 Sunderland Flying Club came into being. On June 28th 1964 an Open Day and commemorative ceremony took place to celebrate the rebirth of what became Sunderland Airport. The Air Day in 1964 became an annual event with subsequent shows attracting greater participation. Sunderland Air Day in June 1981 attracted an estimated 50, 000 people to the airfield and surrounding hills. In the 1980s, 700 people a year made their first parachute jump at Sunderland Airport.

3.2.28 During the 1970s and 1980s, the collapse of manufacturing in the Sunderland area had a detrimental effect on employment. For example, over 34 000 jobs were lost between 1971 and 1981 alone. In the 1980s the economic outlook was bleak, although Sunderland enjoyed Development Area status and was eligible for maximum Urban Aid and EEC grants. The co-ordinated efforts of Sunderland Borough, Tyne and Wear Council, Washington Development Corporation and the government scored a major success in 1984 when they succeeded in attracting Nissan to build its new UK factory on Wearside. The massive Nissan plant was constructed on the 297 acre site of Sunderland (Usworth) Airport.

3.3 PREVIOUS WORK

3.3.1 In 2005, Archaeological Services University of Durham (ASUD) undertook an archaeological desk-based assessment and archaeological monitoring at Nissan Wind Farm (NZ 339 579, to the south of the Nissan factory). The desk-based assessment noted that although there was no direct evidence for prehistoric or Roman activity in the development area the presence of activity in the surrounding vicinity indicated that an as yet unidentified resource has the potential to exist. It was also noted that the use of the site as an airfield in the First and Second World Wars suggested that the site may have undergone significant landscaping to provide a level area for aircraft to land and take off.

3.3.2 An archaeological desk-based assessment was undertaken by On Site Archaeology Ltd (OSA) of land at Nissan Factory Business Park (located between the Nissan factory and the A1231 to the south), Washington, in July 2007 . The work concluded that there was the possibility that buried remains were present on the site, which could date from any period between the early Bronze Age and the present day. It was noted that the remains may survive as features cut into the natural subsoil and would possibly be visible immediately below the topsoil and B-horizon. The top of the archaeology was suggested to be located between 0.2m and 0.5m below the present ground surface.

3.3.3 A geophysical survey was undertaken by Met Surveys in April 2008 at Turbine Business Park, on land to the north of the A1231. The survey covered an area of approximately 20 hectares which at the time was rough pasture. The site had been in agricultural use for the past 20 years and although there were no known sites within the area, it was considered that there was the potential for buried archaeological remains to exist. The survey results revealed no features of archaeological significance, although modern services were noted to run across the site as evidence by manholes. The remains of ridge and furrow were detected in some parts of the site indicating the past agricultural use of the land, but their nature (narrow, closely spaced and straight) suggested they were of relatively modern origin.

3.3.4 Following on from the geophysical survey undertaken by Met Surveys, On Site Archaeology (OSA) conducted an archaeological evaluation on the land at Turbine Park in August 2008. Features such as the ridge and furrow and areas of disturbed ground, highlighted by the geophysical results, were targeted with the evaluation trenches. The work concluded that despite sites apparently rural appearance, it was clear that the site had been heavily re-worked during the 20th century. For example, the central, western and

northern parts of the site had been used to dispose unwanted waste material from building, which may have originated from the construction of the airfield, the test track or the nearby road. In all cases the method of dumping was the same; the topsoil was removed, the 'fill' material was dumped and then the topsoil was reinstated. The only feature potentially older than the 20th century was found in Trench 1 and consisted of a shallow linear feature containing small fragments of white-glazed pottery of 19th or 20th century date. Interestingly, the areas of ridge and furrow apparently revealed by the geophysical survey, and tested by Trenches 6, 8, 9 and 10, were not found. In the cases of Trenches 6 and 8 the presence of respectively c.0.70m thick and a 1.5m thick layer of dumped material would have prevented the detection of any preserved ridge and furrow.

3.3.5 In June 2009, North Pennines Archaeology Limited were commissioned by MDA Consulting Ltd to undertake an archaeological desk-based assessment of the current development area prior to the submission of a planning application for a sustainable manufacturing centre by Gateshead College. The desk-based assessment revealed that the proposed development area appears to have been undeveloped until the construction of the airfield at Usworth in 1916. The land appears to have been agricultural in character, despite industrial activity within close proximity (for example, the various railway branch lines, collieries and brick works). The assessment also demonstrated that Usworth Airfield started life in October 1916 as a Flight Station for 'B' Flight of 36 Squadron, and was initially known as Hylton or West Town Moor. By 1917, when it was used by 'A' Flight, it was starting to be known as Usworth. For most of its wartime career Usworth was a training station. Aerial photographs from 1934 show buildings at the airfield were located on the site of the proposed development area, with the main entrance situated in the approximate location of the present footpath. A map of 1945 shows the extent of the buildings on the site at that date; although these were mostly constructed of timber it is likely these structures sat on brick or concrete footings. An aerial photograph dating to 1941/1942 showed two cropmarks located to the west of the proposed development area; it is not known if these relate to the airfield or are totally unrelated, but they may suggest earlier activity in close proximity to the airfield site.

4 EVALUATION RESULTS

4.1 INTRODUCTION

4.1.1 The trenches were excavated down to the natural substrate where possible, followed by further hand excavation of potential archaeological features allowing an examination of any prospective archaeological remains. Trench locations are depicted in Figure 2.

4.1.2 Plans and sections of Trenches A, B and D can be found on Figure 3, and a plan and section of Trench C can be found on Figure 4.

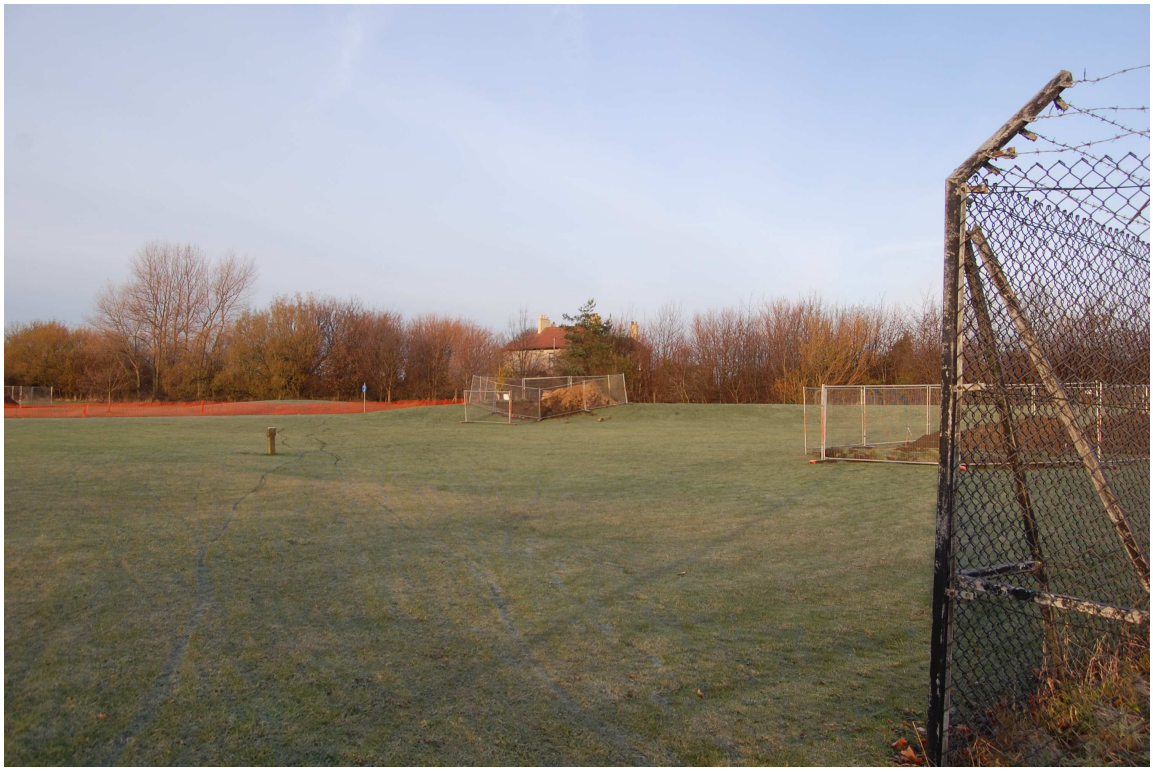

Plate 1. *The site looking northwest.*

4.2 TRENCH A

4.2.1 Trench A measured 10.00m in length and 1.60 in width, and was orientated roughly east-west.

4.2.2 The trench was located to evaluate the potential remains of the western and northern extensions of the Main Stores for the airbase, known to have been of timber construction.

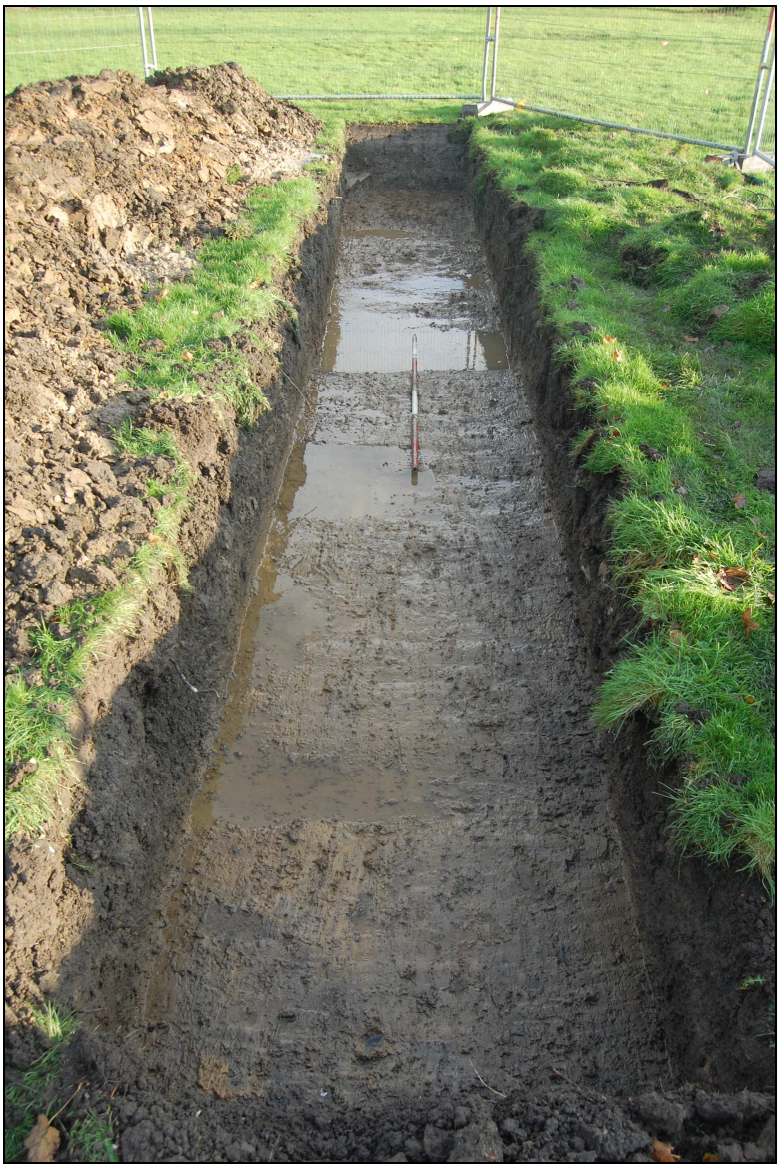

***Plate 2**. Trench A, looking east.*

4.2.3 The natural substrate, context (**102**), was found to be a compact orange/brown sandy clay averaging a depth of 0.68m below the current surface (and at an Ordnance Datum of 32.96m). Above the natural clay was a c.0.35m thick deposit of 20th century backfill, context (**104**), which was a compact mid-grey/brown silty clay with inclusions of small stones, concrete slivers and brick fragments. Above the backfill was a modern subsoil layer, context (**101**), which measured c.0.22m thick and was comprised of loose mid-brown sandy clay. Topsoil and turf, context (**100**), sealed the subsoil with an average depth of 0.14m.

4.2.4 In the north east corner of the trench the edge of a concrete drain, context (**108**), was uncovered aligned northwest-southeast, and sitting within the

modern backfill at 33.12mOD. This suggests that either the drain is not *in-situ*, or that the backfill context was laid at the same time as the drain, possibly as a packing 'foundation' layer for the building.

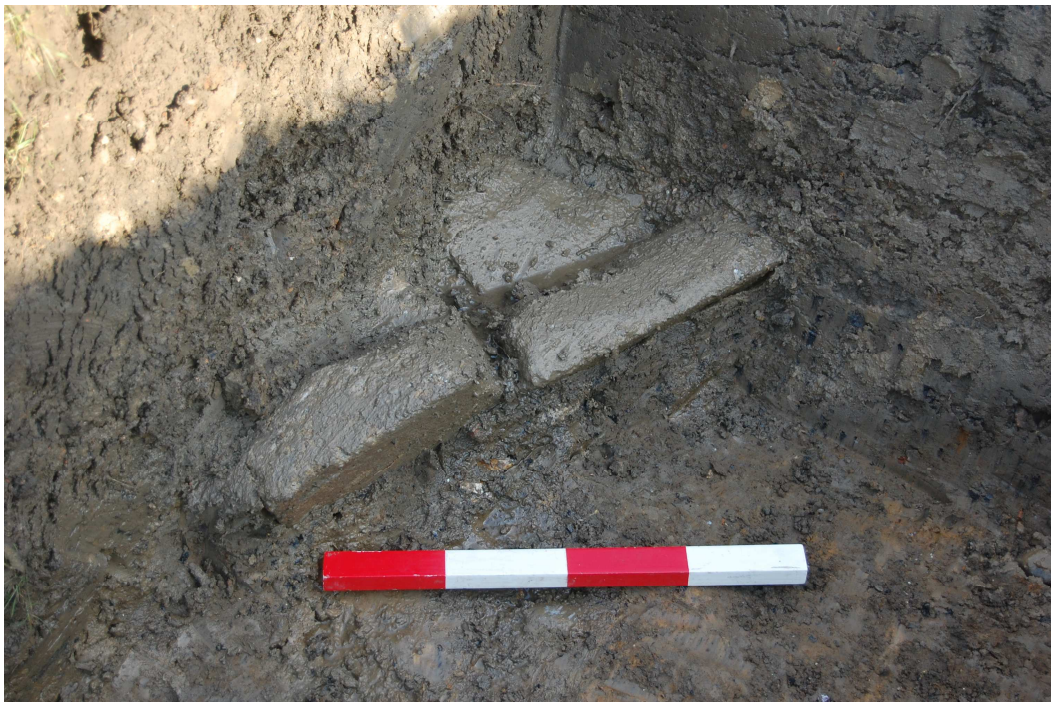

***Plate 3**. Drain (**108**) looking north-east.*

4.2.5 Fragments of late 20th century pottery and glass were recovered from context (**104**), with the other strata remaining artefactually sterile. No deposits were deemed suitable for environmental sampling.

4.3 TRENCH B

4.3.1 Trench B measured 5.0m in length and 3.0m in width, and was orientated roughly east-west .

4.3.2 The trench was located to evaluate the potential remains of the eastern extension of the Main Stores for the airbase, known to have been of timber construction.

4.3.3 The natural substrate, context (**102**), averaged a depth of 0.89m below the current surface (Ordnance Datum of 32.54m). Over the natural clay was a c.0.45m thick deposit of context (**104**), comprising 20th century backfill, above which was the modern subsoil layer, context (**101**), which measured c.0.22m

Topsoil and turf, context (**100**), sealed the subsoil with an average depth of 0.22m.

4.3.4 In the western extent of the trench was the remains of a concrete wall footing (**106**), aligned roughly northwest-southeast (Plate 5). The footing of the wall lay at 32.85m OD, measured 0.47m in width and spanned the width of the trench. The concrete lay on a thin deposit of context (**107**), a black ash and grit deposit which made up the lowest foundation strata of the wall remains.

4.3.5 Fragments of 20th century pottery and glass were recovered from context (**104**), with the other strata remaining sterile of artefacts. No deposits were deemed viable for environmental sampling.

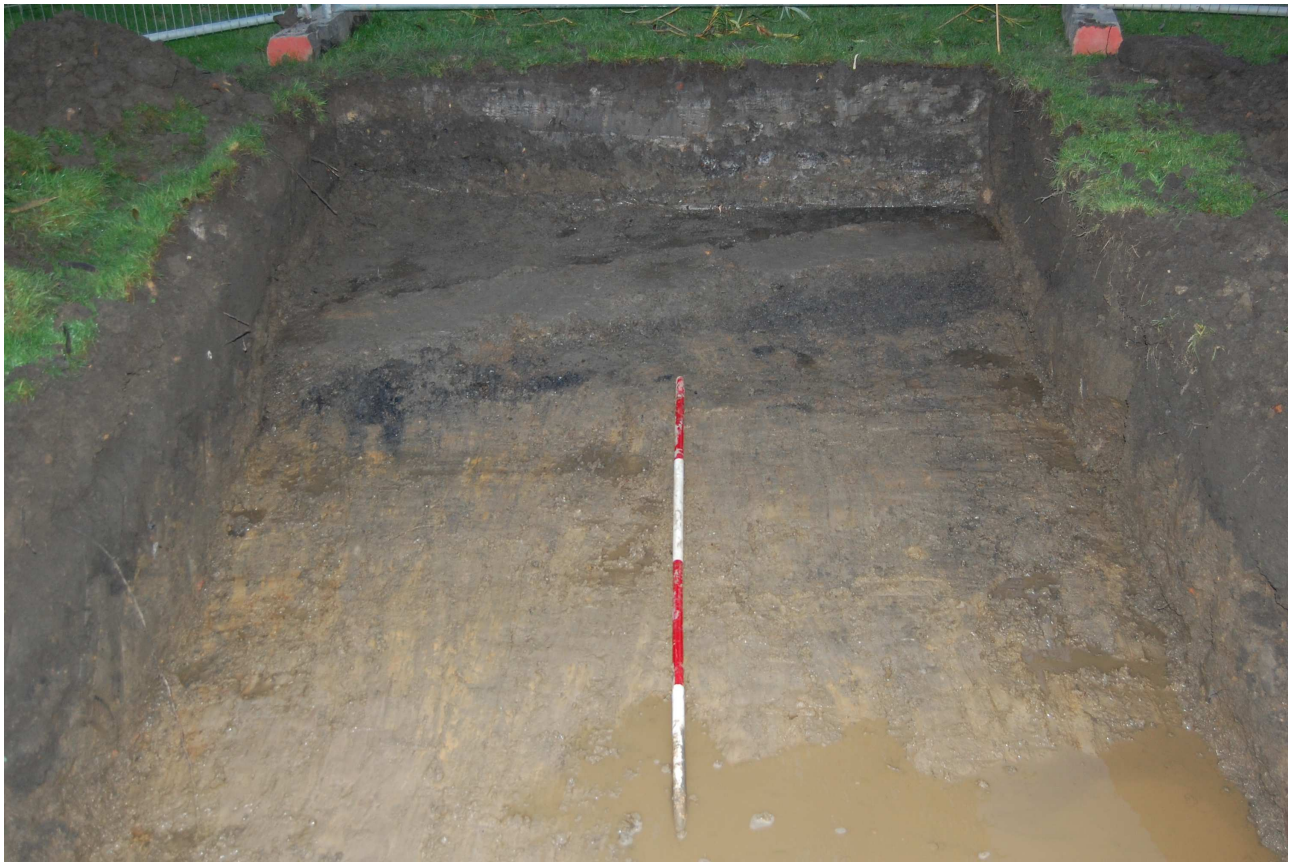

Plate 4. *Trench B, looking west.*

***Plate 5**. Wall footing (106), looking north.*

4.4 TRENCH C

4.4.1 Trench C measured 5.0m in length and 3.0m in width, and was orientated roughly north-south on the crest of a bund bordering the north side of the plot of land to the east of the dividing public path.

4.4.2 The trench was located to evaluate the potential remains of the Motor Transport Sheds and Office for the airbase, known to have been of timber construction.

4.3.3 In this trench, the natural substrate was not revealed due to the trench depth exceeding the reach of the mechanical excavator's bucket due to the trench's position on the bund. The depth excavated reached a vertical 2.02m, with the 20th century backfill layer, context (**104**), revealed 1.70m below the current surface. Over this layer was a 1.06m thick deposit of pale yellow crushed

hardcore, context (**103**), which formed the core of the bund's structure. Above the hardcore was a 0.27m thick deposit of modern subsoil, context (**101**), sealed by a 0.37m deposit of topsoil and turf, context (**100**).

4.3.4 Due to the highly unstable nature of the hardcore, the trench was stepped inwards and the deepest section of the excavation was not entered for recording purposes on Health and Safety grounds.

4.3.5 No artefactual or structural remains were recovered from this trench, and no deposits were deemed suitable for environmental sampling.

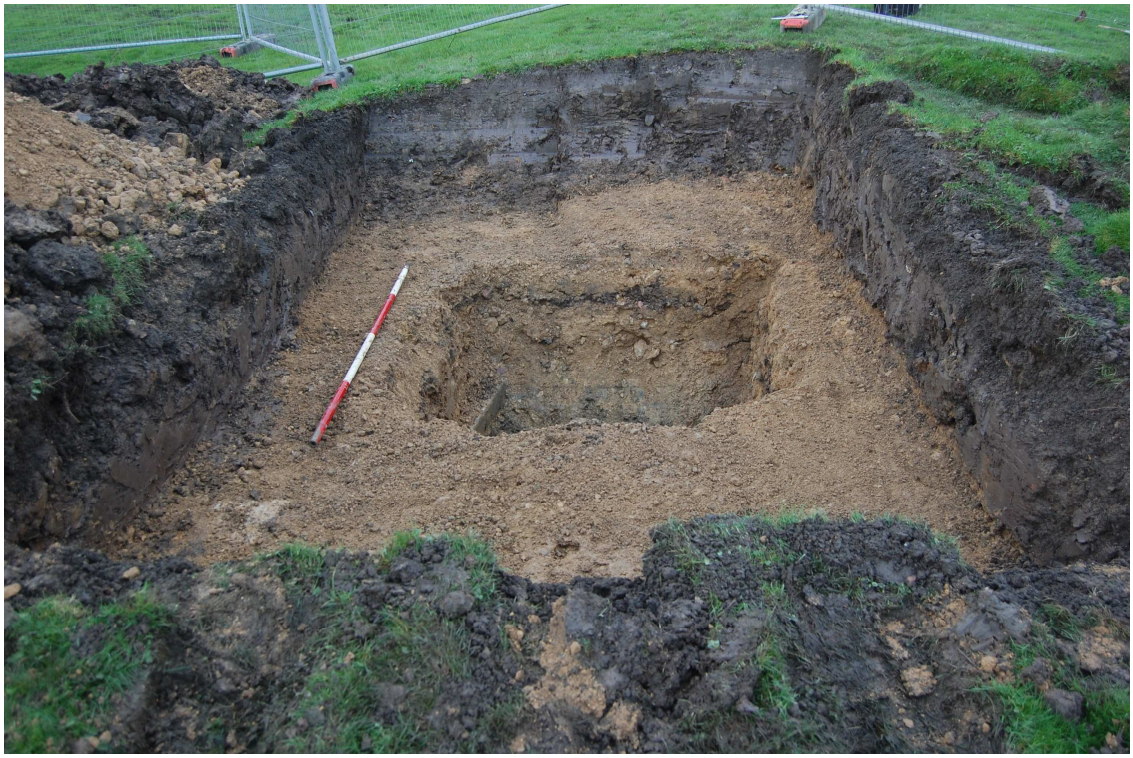

***Plate 6**. Trench C, looking south.*

4.5 TRENCH D

4.5.1 Trench D measured 5.0m in length and 3.0m in width, and was orientated roughly east-west in the eastern extent of the development area.

4.5.2 The trench was located to evaluate the potential remains of the main Workshops for the airbase, known to have been of timber construction.

4.3.3 The natural substrate, context (**102**), was found at a depth of c.0.75m below the current surface (and at an Ordnance Datum of 32.99m). Above the natural clay was a c.0.37m thick deposit of 20th century backfill, context (**104**). Above the backfill was a thin 0.06m thick deposit of pale yellow crushed hardcore, context (**103**), sealed by a c.0.17m thick layer of modern subsoil, context (**101**). As with the previous three trenches, Trench D was

sealed by topsoil and turf, context (**100**), measuring an average thickness of 0.11m.

4.3.4 At the south-western extent of the trench a concrete block, context (**105**), was found embedded in the natural clay. This block measured 0.64m in length, 0.31m in width and had a visible depth of 0.19m. The block was highly degraded, and although it could perhaps have been the remains of a concrete plinth or footing, it is more likely that it is a disturbed block pushed into the natural clay during the leveling of the site.

4.3.5 Fragments of early 20th century pottery were recovered from context (**104**), with the other strata remaining artefactually sterile. No deposits were deemed viable for environmental sampling.

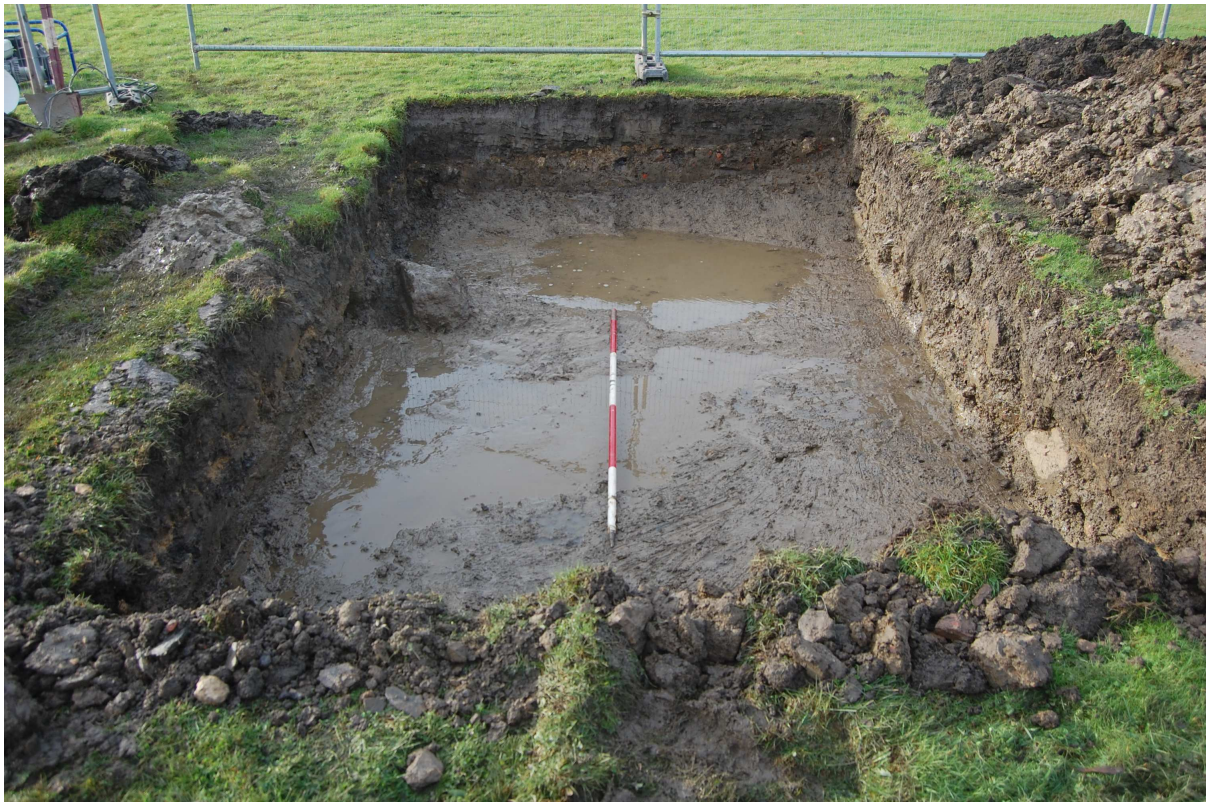

Plate 7. *Trench D, looking west.*

5 CONCLUSIONS AND RECOMMENDATIONS

5.1 CONCLUSIONS

5.1.1 The trenching revealed a relatively uniform stratigraphy, with natural clay underlying all trenches (this is assumed for Trench C) at an average height of 32.83mOD.

5.1.2 All trenches contained a modern 20th century deposit overlying the natural substrate, the top of which averaged a datum height of 33.14mOD. This deposit indicates the level taken during the clearance of the site with any remains of the airfield buildings removed to this depth or below. This deposit also represents the depth of overburden stripped to during the building of the Nissan Works, when the development site was used as a storage and work area: this is demonstrated by the modern crushed hardcore observed in both Trenches C and D. Trench C also showed the use of hardcore to create the landscaped bunds in the northern extent of the site, indicating that the bunds are simply landscape features rather than the remains of airfield buildings.

5.1.3 In Trench A, a concrete drain was uncovered in the northeast corner of the trench set within the modern backfill. While this could be a remnant of the drainage system from the airfield, it is more likely to be part of a drainage system set up while the area was used as a working compound for the construction of the Nissan Works.

5.1.4 Trench B revealed a highly truncated concrete wall footing, which bears no relation to the potential remains of the Main Stores which the trench was targeting. However, the alignment does match with the edge of the road to the east of the building, perhaps indicating that the lowest remains of the road edging still remain *in-situ*.

5.1.5 Overall, the trenching revealed that no timber remains of the buildings targeted remain in the evaluation area, with concrete footing remains minimal at best, with the majority removed during the 1980s when the area was used as a compound during the construction of the Nissan Works to the south.

5.2 RECOMMENDATIONS

5.2.1 The potential for archaeological remains within the development area remains low. Given the lack of any significant archaeological features during the evaluation it is recommended that no further work takes place.

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APPENDIX 1: CONTEXT TABLE

Context	Context Type	Description
(100)	Deposit	Modern topsoil and turf.
(101)	Deposit	Modern subsoil.
(102)	Natural Substrate	Yellow-brown compact sandy clay.
(103)	Deposit	Crushed hardcore in Trenches C and D.
(104)	Deposit	Modern backfill.
(105)	Deposit	Concrete block embedded in natural clay in Trench D.
(106)	Deposit	Concrete wall footing in Trench B.
(107)	Deposit	Packing material for wall footing (106).
(108)	Deposit	Concrete drain in Trench A.

***Table 1**. List of Contexts issued during the Evaluation*

APPENDIX 2: BRIEF

Tyne and Wear Specialist Conservation Team

Specification for Preliminary Archaeological Evaluation at Land off access road to A1290, Nissan, Washington Road, Usworth

Planning Application: 09/02486/FUL

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Date: 3 September 2009

County Archaeologist's Reference Number: MON7453

The Tyne and Wear Specialist Conservation Team is the curatorial service for archaeology, industrial archaeology and historic buildings throughout the Tyne and Wear districts. It helps and advises Newcastle, Gateshead, North Tyneside, South Tyneside and Sunderland Councils to carry out their statutory duties to care for the precious historic environment of Tyneside and Wearside. The Team can be found at the Strategic Housing, Planning and Transportation Division of the Environment & Regeneration Directorate of Newcastle City Council.

Introduction

Site grid reference: NZ 340 588

Planning permission has been granted for a two storey office and teaching facility comprising of classrooms, lecture theatre, café, offices and learning resource centre. Attached to this will be a steel portal framed training facility for motor manufacturing and productivity. An

archaeological desk based assessment has been produced (North Pennines Archaeology Ltd, June 2009). The appointed archaeologist must familiarise themselves with the results of this previous archaeological work on the site before starting work.

The report concludes that the site was undeveloped until the construction of the airfield in 1916. Hylton or West Moor Airfield was a Flight Station for 'B' Flight of 36 Squadron. By 1917 it was used by 'A' Flight and was also known as Usworth. There were buildings associated with the airfield within the development site in 1934. They were probably timber buildings on brick or concrete footings. Buildings were present throughout World War Two and into the 1950s. A plan of 1945 identifies some of the buildings within the site as a fire tender garage, MT sheds, station offices and workshops.

The eastern part of the site has been landscaped. The western side is grassed with trees and also landscaped. In accordance with PPG16 and UDP Policy B14 a programme of archaeological evaluation is required to ascertain if any trace of these buildings survives.

Research Aims and Objectives

The evaluation report should make reference to Regional and Thematic Research Frameworks. The North-East Regional Research Framework for the Historic Environment (2006) notes the importance of research as a vital element of development-led archaeological work. It sets out key research priorities for all periods of the past allowing commercial contractors to demonstrate how their fieldwork relates to wider regional and national priorities for the study of archaeology and the historic environment. The aim of NERRF is to ensure that all fieldwork is carried out in a secure research context and that commercial contractors ensure that their investigations ask the right questions.

See http://www.algao.org.uk/Association/England/Regions/ResFwks.htm

Ideally and where possible the evaluation should cross-reference its aims and objectives to national priorities, defined in SHAPE (Strategic Frameworks for Historic Environment Activities and Programmes in English Heritage), and the English Heritage Research Agenda 2005-2010.

Where appropriate note any similar nationwide projects using ADS, internet search engines, ALSF website, HEEP website, OASIS, NMR excavation index. All staff on site must understand the project aims and methodologies.

Methods statement

Four evaluation trenches are needed to inform the Planning Authority of the character, nature, date, depth, degree of survival of archaeological deposits on this site. The excavation must be carried out by a suitably qualified and experienced archaeological organisation. The work will record and environmentally sample any

archaeological deposits of importance found on the plot. The purpose of this brief is to obtain tenders for this work. The report must be the definitive record for deposition in the Tyne and Wear HER, and it must contain recommendations for any further archaeological work needed on this site. The commissioning client needs to be aware that the purpose of the preliminary

evaluation is merely to ascertain if archaeological remains survive on this site and if they do, to determine their broad date, nature and function. Where archaeological remains are found in the preliminary trenches, and if these remains are at threat by the proposed development, further archaeological excavation and or a watching brief will be required before and during development work.

All staff employed by the Archaeological Contractor shall be professional field archaeologists with appropriate skills and experience to undertake work to the highest professional standards. The work will be undertaken according to English Heritage Guidelines – Managing Archaeological Projects 2nd Edition ('MAP2') 1991 (www.englishh.gov.uk/ guidance/ map2/ index.htm) and Management of Research Projects in the Historic Environment (MoRPHE) – The MoRPHE Project Managers' Guide, Project Planning Notes and Technical Guides 2006 (www.englishheritage.org.uk/publications).

The work will be undertaken according to MoRPHE Project Planning Notes 2006 - PPN3 – Archaeological Excavation and PPN6 – Development of Procedural standards and guidelines for the historic environment.

All work must be carried out in compliance with the codes of practice of the Institute of Field Archaeologists and must follow the IFA Standard and Guidance for Archaeological Field Evaluations, Excavation or Watching Briefs as appropriate. www.archaeologists.net

Notification

The County Archaeologist needs to know when archaeological fieldwork is taking place in Tyne and Wear so that he can inform the local planning authority and can visit the site to monitor the work in progress. The Archaeological Contractor must therefore inform the County Archaeologist of the start and end dates of the Evaluation. He must also keep the County Archaeologist informed as to progress on the site. The CA must be informed of the degree of archaeological survival and of any significant finds. The Client will give the County Archaeologist reasonable access to the development to undertake monitoring.

PROJECT INITIATION

PROJECT DESIGN

Because this is a detailed specification, the County Archaeologist does not require a Project Design from the appointed archaeologist. However a health and safety statement and risk assessment, identifying potential risks in a risk log (see template in appendix 2 of The MoRPHE Project Manager's Guide) and specifying suitable countermeasures and contingencies, is required to be submitted to the commissioning client.

The Management of Research Projects in the Historic Environment (MoRPHE) – The MoRPHE Project Managers' Guide 2006 contains general guidance on Risk management (section 2.3.2, Appendix 2).

Risk assessments must be produced in line with legislative requirements (for example the Health and Safety at Work Act 1974, the Management of Health and Safety at Work Regulations 1999, the Control of Substances Hazardous to Health (COSHH) Regulations 2002

and the Personal Protective Equipment at Work Regulations 2002) and best practice e.g. as set out in the SCAUM (Standing Conference on Archaeological Unit Managers) Health and Safety Manual http://www.scaum.org/uk

Detailed information on hazards and how to carry out a risk assessment can be obtained from the Health and Safety Executive (www.hse.gov.uk) and the local authority health and safety department.

Specific guidance for land contamination and archaeology can be obtained from the Institute for Archaeologists (www.archaeologists.net), the Construction Industry Research and Information Association (www.contaminated-land.org) and the Association of Geotechnical and Geoenvironmental Specialists (www.ags.org.uk). See also Environment Agency, 2005 "Guidance on Assessing the Risk Posed by Land Contamination and its Remediation on Archaeological Resource Management".

The Archaeological Contractor must be able to provide written proof that the necessary levels of Insurance Cover are in place. The Archaeological Contractor must detail measures taken to ensure the safe conduct of excavations, and must consult with the client's structural engineers concerning working in close proximity to the foundations of the surrounding buildings. The Client may wish to see copies of the Archaeological Contractor's Health and Safety Policies.

The Archaeological Contractor must maintain a Site Diary for the benefit of the Client, detailing the nature of work undertaken on a day by day basis, with full details of Site Staff present, duration of time on site, etc. and contact with third parties.

PROJECT EXECUTION

1) Archaeological evaluation

The appointed archaeological contractor will decide where best to put the trenches to avoid the most obviously landscaped parts of the site. The dimensions of the four trenches are each 1.5m x 20m in plan at base. The trenches will be located on the sites of former buildings as shown on the plan of 1945 (figure 10 in the desk based assessment).

A trench location plan will be sent to the Archaeology Officer for approval before starting work. Trench locations can be adjusted to avoid services or for practical or safety purposes. Trenches can be widened if feasible in order to step the sides to reach depths over 1.2m where necessary, otherwise shoring will be required. Trenches must avoid known services.

Trenches must stay a safe distance away from pylons and overhead power lines. The commissioning client will advise of any ecological or biodiversity issues which need to be taken into consideration. The commissioning client will advise of any protected trees which must be avoided by the evaluation. Damage to trees covered by a Tree Protection Order carries a substantial fine.

Trench positions should be accurately surveyed prior to excavation and tied in to the national grid. The trenches should be excavated to the depth natural subsoil if this can be reached safely.

Tasks

Hand excavation, recording and environmental sampling (as stipulated below) of deposits down to the depth specified above. Any modern overburden or levelling material can be machined-off using a wide toothless ditching bucket under strict archaeological supervision and the remaining deposits are to be excavated by hand. All faces of the trench that require examination or recording will be cleaned.

Excavation is to be carried out with a view to avoid damage to any archaeological features which appear to worthy of preservation in-situ. Excavation is to be carried out by single context planning and recorded on *pro-forma* context sheets. Features over 0.5 m in diameter can be half sectioned.

Environmental sampling (and where relevant scientific dating) are compulsory parts of the evaluation exercise. All tenders will give a price for the assessment, full analysis, report production and publication per environmental and scientific dating sample as a contingency.

Samples will be taken of bricks from any brick-built structures. The dimensions of the bricks and the type of bonding must be recorded. Scientific investigations should be undertaken in a manner consistent with "The Management of Archaeological Projects", English Heritage 1991 and with "Archaeological Science at PPG16 Interventions: Best Practice for Curators and Commissioning Archaeologists", English Heritage, 2003. Advice on the sampling strategy for environmental samples and samples for scientific dating etc. must be sought from Jacqui Huntley, English Heritage Regional Advisor for Archaeological Science (jacqui.huntley@english-heritage.org.uk or 07713 400387) before the evaluation begins. See Appendix 1 for more information.

See Appendix 2 for guidance on procedures relating to human remains.

See Appendix 4 for guidance on Treasure Act procedures.

The spoil can be kept close-by and rapidly backfilled into the trenches at the conclusion of this work.

Recording

A full written, drawn (accurate scale plans, elevations and section drawings) and photographic record (of all contexts in black and white print and colour transparency with clearly visible graduated metric scale) will be made. The finished report must include a plan and section of each trench (even where no archaeological remains are recorded) plus plans and sections through excavated archaeological features.

The plans will include at least two site grid points and will show section line end points.

The plans will depict building material (i.e. brick and stone) where a complex of structures has been found.

Where there is a complex of interlocking multi-phased structures, a phasing plan will also be included.

There will be elevation drawings of any standing structures such as walls.

Pro-forma context sheets will be used.

All deposits and the base of the trench will be levelled. Levels will be expressed as metres above Ordnance Datum.

Stratigraphy shall be recorded even when no archaeological features have been recognised.

A 'Harris' matrix will be compiled where stratified deposits are recorded.

2) Post-excavation and report production

Finds Processing and Storage

The Archaeological Contractor will process and catalogue the finds in accordance with Museum and Galleries Commissions Guidelines (1992) and the UKIC Conservation Guidelines, and arrange for the long term disposal of the objects on behalf of the Client. A catalogue of finds and a record of discard policies, will be lodged with the finds for ease of curation. Finds shall be recorded and processed in accordance with the IFA Guidelines for

Finds Work

Finds will be assessed by an experienced finds specialist. Human and animal bone assemblages should be assessed by a recognised specialist (see Appendices 2 and 3 for more information). Industrial slag and metal working debris will be assessed by a specialist. Assessment should include x-radiography of all iron objects (after initial screening to exclude recent debris) and a selection of non-ferrous artefacts (including all coins). Refer to "Guidelines on the x-radiography of archaeological metalwork, English Heritage, 2006.

Brick dimensions will be measured and a note made of the bonding material. If necessary, pottery sherds and bricks should be recommended for Thermoluminescence dating.

Finds processing, storage and conservation methods must be broadly in line with current practice, as exemplified by the IFA "Standard and guidance for the collection, documentation, conservation and research of archaeological materials", 2001. Finds should be appropriately packaged and stored under optimum conditions, as detailed in the RESCUE/UKIC publication "First Aid for Finds"

(Watkinson and Neal 1998). Proposals for ultimate storage of finds should follow the UKIC publication "Guidelines for the Preparation of Excavation Archives for Long-term Storage" (Walker 1990). Details of methodologies may be requested from the Archaeological Contractor.

Other useful guidance – "A Strategy for the Care and Investigation of Finds",

English Heritage, 2003, "Finds and Conservation Training Package", English Heritage, 2003.

All objects must be stored in appropriate materials and conditions to ensure minimal deterioration. Advice can be sought from Jacqui Huntley of English Heritage (07713 400387) where necessary.

PRODUCTS

The report

1. The Archaeological Contractor must produce an interim report of 200 words minimum, two weeks after the completion of the field-work, for the Client and the Planning Authority, with a copy for information to the County Archaeologist. This will contain the recommendations for any further work needed on site.

2. The production of Site Archives and Finds Analysis will be undertaken according to English Heritage Guidelines - Managing Archaeological Projects 2nd Edition ('MAP2') 1991 and Management of Research Projects in the Historic Environment (MoRPHE) 2006.

3. A full archive report or post-excavation assessment, with the following features should be produced within six months of the completion of the fieldwork. All drawn work should be to publication standard. The report must include:

* Location plans of trenches and grid reference of site

* Site narrative – interpretative, structural and stratigraphic history of the site

* Plans showing major features and deposit spreads, by phase, and section locations

* Sections of the two main trench axes and through excavated features with levels

* Elevation drawings of any walls etc. revealed during the excavation

* Artefact reports – full text, descriptions and illustrations of finds

* Tables and matrices summarising feature and artefact sequences.

* Archive descriptions of contexts, grouped by phase (not for publication)

* Deposit sequence summary (for publication/deposition)

* Colour photographs of trenches and of archaeological features and finds

* Laboratory reports and summaries of dating and environmental data, with collection methodology.

* A consideration of the results of the field-work within the wider research context (ref. NERRF).

* Recommendations for further work on site, or further analysis of finds or environmental samples

* Copy of this specification

4. Three bound and collated copies of the report need to be submitted:

• one for the commissioning client

• one for the planning authority (Sunderland City Council) – this must be formally submitted by the developer to the planning department with the appropriate fee.

• one for deposition in the County HER at the address below. A digital copy of the report on CD is also required by the HER in a plastic case. Please do not attach this to the report. The report and CD for the HER must be sent by the archaeological consultant or their client directly to the address below. If the report is sent via the planning department, every page of the report will be stamped with the planning application number which ruins the illustrations. The HER is also often sent a photocopy instead of a bound colour original which is unacceptable.

Publication

If significant archaeological features are found during the evaluation, the results may also warrant publication in a suitable archaeological journal. The tender should therefore include an estimated figure for the production of a short report of, for example 20 pages, in a journal such as Archaeologia Aeliana, the Arbeia Journal, Industrial Archaeology Review or Durham Archaeological Journal. This is merely to give the commissioning client an indication of potential costs. Before preparing a paper for publication, the archaeological contractor must discuss the scope, length and suitable journal with the County Archaeologist.

Archive Preparation and Dissemination

The archive should be a record of every aspect of an archaeological project – the aims and methods, information and objects collected, results of analysis, research, interpretation and publication. It must be as complete as possible, including all relevant documents, records, data and objects {Brown, 2007, 1}.

The site archive (records and materials recovered) should be prepared in accordance with Managing Archaeological Projects, Second Edition, 5.4 and appendix 3 (HBMC 1991), MoRPHE Project Planning Notes 2006 PPN3 – Archaeological Excavation, "Archaeological documentary archives" IFA Paper No. 1, "Archaeological Archives – creation, preparation, transfer and curation"Archaeological Archives Forum etc., Guidelines for the Preparation of Excavation Archives for Long Term Storage (UKIC 1990) and "Archaeological Archives – A guide to best practice in creation, compilation, transfer and curation" by Duncan H. Brown, Archaeological Archives Forum, July 2007.

Documentary Archive

The documentary archive comprises all records made during the archaeological project, including those in hard copy and digital form. This should include written records, indexing, ordering, quantification and checking for consistency of all original context sheets, object records, bulk find records, sample records, skeleton records, photographic records (including negatives, prints, transparencies and x-radiographs), drawing records, drawings, level books, site note-books, spot-dating records and conservation records, publication drafts, published work, publication drawings and photographs etc.

A summary account of the context record, prepared by the supervising archaeologist, should be included. All paper-based material must at all times be stored in conditions that minimise the risk of damage, deterioration, loss or theft. Do not fold documents. Do not use self-adhesive labels or adhesive or tape of any kind. High quality paper (low-acid) and permanent writing materials must be used.

Original drawings on film must be made with a hard pencil, at least 4H. Do not ink over original pencil drawings. Use polyester based film for drawings (lasts longer than plastic).

Store documents in acid-free, dust-proof cardboard boxes. Store documents flat. All documents must be marked with the project identifier (e.g. site code) and/or the museum accession number. All types of record must use a consistent terminology and format.

Use non-metal fastenings, and packaging and binding materials that ensure the longevity of documents. Copies of reports and appropriate drafts, with associated illustrative material, must be submitted for inclusion with the archive.

Material Archive

The material archive comprises all objects (artefacts, building materials or environmental remains) and associated samples of contextual materials or objects. All artefacts and ecofacts retained from the site must be packed in appropriate materials. All finds must be cleaned as appropriate to ensure their long-term survival.

All metal objects retained with the archive must be recorded by x-radiograph (except gold or lead alloys or lead alloys with a high lead content and objects too thick to be x-rayed effectively e.t.c.)

All finds must be marked or labelled with the project and context identifiers and where relevant the small-finds number. Use tie-on rot-proof labels where necessary. Bulk finds of the same material type, from the same context, may be packed together in stable paper or polythene bags. Mark all bags on the outside with site and context identifiers and the material type and include a polyethylene label marked with the same information.

Use permanent ink on bags and labels. Sensitive finds must be supported, where appropriate, on inert plastic foam or acid-free tissue paper. It is not advisable to wrap objects in tissue as the unwrapping could cause damage.

The archive will be placed in a suitable form in the appropriate museum (typically the Museum of Antiquities for Newcastle (stores in Bedson Building and at Team Valley) and Tyne and Wear Museums for the rest of Tyne and Wear (check with these institutions) with the landowner's permission. Contact Andrew Parkin at the Museum of Antiquities (0191 2228996) and Alex Croom at Tyne and Wear Museums (0191 4544093).

A letter will be sent to the County Archaeology Officer within six months of the report having been submitted, confirming where the archive has been deposited.

Digital Archive

See MoRPHE Technical Guide 1 – Digital Archiving & Digital Dissemination 2006.

SIGNPOSTING

OASIS

The Tyne and Wear County Archaeologist supports the Online Access to the Index of Archaeological Investigations (OASIS) project. This project aims to provide an online index/access to the large and growing body of archaeological grey literature, created as a result of developer-funded fieldwork.

The archaeological contractor is therefore required to register with OASIS and to complete the online OASIS form for their evaluation at http://www.oasis.ac.uk/.

Please ensure that tenders for this work takes into account the time needed to complete the form.

Once the OASIS record has been completed and signed off by the HER and NMR the information will be incorporated into the English Heritage Excavation Index, hosted online by the Archaeology Data Service.

The ultimate aim of OASIS is for an online virtual library of grey literature to be built up, linked to the index. The unit therefore has the option of uploading their grey literature report as part of their OASIS record, as a Microsoft Word document, rich text format, pdf or html format. The grey literature report will only be mounted by the ADS if both the unit and the HER give their agreement. The grey literature report will be made available through a library catalogue facility.

Please ensure that you and your client understand this procedure. If you choose to upload your grey literature report please ensure that your client agrees to this in writing to the HER at the address below.

For general enquiries about the OASIS project aims and the use of the form please contact: Mark Barratt at the National Monuments Record (tel. 01793 414600 or oasis@english-heritage.org.uk). For enquiries of a technical nature please contact: Catherine Hardman at the Archaeology Data Service (tel. 01904 433954 or oasis@ads.ahds.ac.uk). Or contact the Tyne and Wear Archaeology Officer at the address below.

The tender

Tenders for the work should contain the following:-

1. Brief details of the staff employed and their relevant experience

2. Details of any sub-contractors employed

3. A quotation of cost, broken down into the following categories:-

* Costs for the excavation, incl. sub-headings of staff costs on a person-day basis, transport, materials, and plant etc.

* Post-excavation costs, incl. storage materials

* Cost of Environmental analysis and scientific dating per sample

* Estimated cost for full publication of results in an archaeological journal

* Overheads

4. An indication of the required notification period (from agreement to start date) for the field-work; the duration of fieldwork and the expected date for completion of the post-excavation work (a maximum of 6 months after completion of the fieldwork)

Monitoring

The Archaeological Contractor will inform the County Archaeologist of the start and end dates of the excavation to enable the CA to monitor the work in progress. Should important archaeological deposits

be encountered, the County Archaeologist must be informed. If further archaeological evaluation is required on this site, then the archaeological contractor must submit a written scheme of investigation for approval by the CA before extending the size of the trenches.

APPENDICES

1 Environmental Sampling, Scientific Analysis and Scientific Dating

This is a compulsory part of the evaluation exercise. Scientific investigations should be undertaken in a manner consistent with "The Management of Archaeological Projects", English Heritage 1991 and with "Archaeological Science at PPG16 Interventions: Best Practice for Curators and Commissioning Archaeologists", English Heritage, 2003.

Aims of environmental sampling – to determine the abundance/concentration of the material within the features and how well the material is preserved, to characterise the resource (the site) and each phase, to determine the significance of the material and its group value, what crop processing activities took place on the site? What does this tell us about the nature of the site? Is there any evidence for changes in the farming practice through time? How did people use this landscape? Can we place certain activities at certain locations within the site?

Function and date of individual features such as pits, hearths etc. Are the charred assemblages the result of ritual deposition or rubbish? Is the charcoal the result of domestic or industrial fuel?

Advice on the sampling strategy for environmental samples and samples for scientific dating etc. must be sought from Jacqui Huntley, English Heritage Regional Advisor for Archaeological Science (07713 400387) before the evaluation begins. The sampling strategy should include a reasoned justification for selection of deposits for sampling.

Deposits should be sampled for retrieval and assessment of the preservation conditions and potential for analysis of biological remains (English Heritage 2002). Flotation samples and samples taken for coarse-mesh sieving from dry deposits should be processed at the time of fieldwork wherever possible. Sieving recovers fish, amphibian, small bird and mammal bone, small parts of adult mammals and young infused bones which may be under-represented otherwise. However it is noted that clay soils in this region make sieving difficult. Discuss the potential for sieving with Regional Advisor for Archaeological Science.

Environmental samples (bulk soil samples of 30-40 litres volume) will be collected by the excavator from suitable (i.e. uncontaminated) deposits. It is suggested that a large number of samples be collected during evaluation from which a selection of the most suitable (uncontaminated) can be processed. All tenders will give a price for the assessment, full analysis, report production and publication per sample. The full 30-40 litre sample must be assessed by the laboratory, not just a small sub-sample.

Deposits will be assessed for their potential for radiocarbon, archaeomagnetic (guidance is available in the Centre for Archaeology Guideline on Archaeometallurgy 2001) and Optically Stimulated Luminescence dating. Timbers will be assessed for their potential for dendrochronology dating. Sampling should follow procedures in "Dendrochronology: guidelines on producing and interpreting dendrochronological dates", Hillam, 1998. All tenders will quote the price of these techniques per sample.

The following information should be provided with the environmental samples to be processed – brief account of nature and history of the site, aims and objectives of the project, summary of archaeological results, context types and stratigraphic relationships, phase and dating information, sampling and processing methods, sample locations, preservation conditions, residuality/contamination etc.

Laboratory processing of samples shall only be undertaken if deposits are found to be reasonably well dated, or linked to recognisable features and from contexts the derivation of which can be understood with a degree of confidence.

A range of features, and all phases of activity, need to be sampled for charred plant remains and charcoal. Aceramic features should not be avoided as the plant remains from these features may help to date them. Deep features should be sampled in spits to pick up changes over time. Part, or all of each of the contexts should be processed. In general samples should be processed in their entirety. All flots should be scanned, and some of the residues.

Pollen

Pollen samples can be taken from features such as lakes, ponds, palaeochannels, estuaries, saltmarshes, mires, alluvium and colluvium, and from waterlogged layers in wells, ditches and latrines etc. Substances such as honey, beer or food residues can be detected in vessels. Activities such as threshing, crop processing and the retting of flax can be identified. When taken on site, pollen samples should overlap. Your regional science advisor can advise on the type of corer or auger which would be most appropriate for your site. Samples need to be wrapped in clingfilm and kept dark and cool. Make a description of the sediments in which the pollen was found, and send this with the sample to be assessed.

Forams and diatoms

Coastal or estuary sites (even those which are now well drained) are suitable for sampling for foraminifera. Diatoms can also be found on marine sites, but also in urban settings (sewers, wells, drains, ditches etc). They only survive in waterlogged conditions. These aquatic microfossils are used as proxy indicators of the former aquatic ecological conditions on site, changes in sea levels and temperature, salinity, PH and pollution. Forams are taken from cores, monolith tins or bulk samples. Diatoms are cut from monolith tins or cores or taken as spot

samples.

Insects

Insects, which are useful as palaeoenvironmental indicators, survive best in waterlogged deposits such as palaeochannels and wells. They can provide information on climate change and landscape reconstruction as some species are adapted to particular temperatures, habitats or even particular trees. Certain insects can indicate the function of a feature or building (eg. Weevils, which were introduced by the Romans, often indicate granary sites, parasites will indicate the presence of particular animals such as sheep or horse, latrine flies survive in the

mineral deposits in latrines, or in the daub of medieval buildings etc). Samples need to be sealed (eg. in a plastic box).

Industrial Activity

Where there is evidence for industrial activity, macroscopic technological residues should be collected by hand. Separate samples should be collected for microslags (hammer-scale and spherical droplets). Guidance should be sought from the English Heritage Regional Science Adviser on the sampling strategy for metalworking features and advice on cleaning and packaging. Specialist on-site advice must be sought on identification of metalworking features. Slag and metal working debris must be assessed by a specialist. Scientific analysis (such as x-ray fluorescence, chemical analysis, metallography or scanning electron microscope) of slag can provide information on the melting temperature, chemical composition (is it iron, zinc, copper etc), microstructure (the type and shape of the crystals), physical properties (the hardness or viscosity), isotopic composition (strontium_87 or strontium_88 etc) and mineralogical composition. Guidance is available in the English Heritage "Archaeometallurgy" guidelines, 2001; "Archaeomagnetic dating", 2006 and "Guidelines on the X-radiography of archaeological metalwork", 2006. See also Historical Metallurgy Society, 2008, "Metals and metalworking: a research framework for archaeometallurgy".

Buried soils and sediments

Buried soils and sediment sequences should be inspected and recorded on site by a recognised geoarchaeologist. Procedures and techniques in the English Heritage document "Environmental Archaeology", 2002 and "Geoarchaeology", 2004 should be followed.

Wood

Sampling strategies for wooden structures should follow the methodologies presented in "Waterlogged wood. Guidelines on the recording, sampling, conservation and curation of waterlogged wood" R. Brunning, 1996. If timbers are likely to be present on your site, contact a wood specialist beforehand. Preexcavation planning – determine questions to ask, agree on a sampling strategy, allocate reasonable time and budget. Soil samples should be taken of the sediments surrounding the timber. Keep the timbers wet! Record them asap onsite – plan, photograph, record the size and orientation of the wood (radial, tangential,transverse), any toolmarks, joints, presence of bark, insect damage, recent breaks, and if another piece of wood was on top of or below the piece sampled. Both vertical and horizontal positioning of wattling must be recorded. Wood samples can provide information on woodland management such as medieval coppicing, type of taxa (native or foreign), conversion technology (how the wood was turned into planks), building techniques and type of tools used. Suitable samples should be submitted for dendrochronological dating. See English Heritage guidelines, 2004, "Dendrochronology".

Leather and organic materials

Waterlogged organic materials should be dealt with following recommendations in "Guidelines for the care of waterlogged archaeological leather", English Heritage and Archaeological Leather Group 1995.

2 Animal Bone

Animal bone can explore themes such as hunting and fowling, fishing, plant use, trade network, seasonality, diet, butchery, animal husbandry, food procurement, age structures, farrowing areas, species ratios, local environment. Domestic animal bone was used in prehistoric and Roman cremation rituals. Post medieval cattle bones – small cow bones invariably represent animals which produced high quality buttermilk for cheese. Big 'improved' cattle with large bones were produced for large quantities of meat and poorer quality milk. Large and small cattle bones are often found together on post medieval sites, usually with less of the small bones.

Animal bone assemblages should be assessed by a recognised specialist. The specialist will need to know a brief account of the nature and history of the site, an account of the purpose, methods (details of sampling) for recovery of animal bones, and the main aims and results of the excavation, details of any specific questions that the excavator wants the animal bone specialist to consider, information about other relevant finds from the excavation (e.g. bone tools, fishing equipment, weaving equipment), specific information about each context that has produced significant quantities of animal bone (recovery method, phase, context type, position in relation to major structures, contamination by more recent material, some indication of the amount of bone (by weight or by container size). See "Ancient Monuments Laboratory Advisory Note, "Assessment of animal bone collections from excavations", Sebastian Payne, 1991and "The Assessment of a collection of animal bones", S. Davis, n.d., Ancient Monuments Laboratory.

Fish bone – there was some herring exploitation in the early medieval period. Christian fasting from around 970 allowed fish to be eaten on Fridays which led to a huge demand for fish. There was an increase in marine fishing, fish trade and fish consumption (cod, haddock, ling, herring etc) around 1000 AD. Middens provide evidence of commercial fishing. There was a decline in freshwater fish (cyprinid or carp, salmon, smelt, eel, pike) from the eleventh century.

Smoking fish is a recent practice. They were previously air dried and salted. Newcastle was a major port. Samples should be sieved to retrieve fish and bird bones along with small parts of other animal skeletons and young infused bones. A crane bone was recovered from excavations at Tuthill Stairs, Newcastle – a rare find. Herring bones are so small that they can only be retrieved by 2mm sieving. Clay soils are difficult to sieve, hot water can help. Acidic soils mean poor preservation of bone.

See English Heritage 2002, "Environmental Archaeology – a guide to the theory and practice of methods from sampling and recovery to post excavation", Centre of Archaeology Guideline 1. Isotope analysis can determine where the fish were coming from – North Sea, Scandinavia, Newfoundland, Iceland etc.

There is an excellent reference collection of fish bone at York. Fish bones should be archived to museums for future dating and isotope analysis where this is not undertaken as part of the post-excavation process.

www.fishlab.org

3 Human Remains

Human remains must be treated with care, dignity and respect. Excavators must comply with the relevant legislation (essentially the Burial Act 1857) and local environmental health concerns. If found, human remains must be left in-situ, covered and protected. The archaeological contractor will be responsible for informing the police, coroner, local Environmental Health department and the County Archaeologist. If it is agreed that removal of the remains is essential, the archaeological contractor will apply for a licence from the Home Office and their regulations must be complied with.

Site inspection by a recognised osteologist is desirable for isolated burials and essential for cemeteries. The remains will be recorded in-situ and subsequently lifted, washed in water (without additives). They will be marked and packed to standards compatible with "Excavation and post-excavation treatment of cremated and inhumed human remains", McKinley and Roberts, 1993. After excavation, the remains will be subject to specialist assessment. Analysis of the osteological material should take place according to published guidelines "Human Remains from Archaeological Sites, Guidelines for producing assessment documents and analytical reports, English Heritage, 2002.

Some of the potential benefits from the study of human skeletons – demography, growth profiles, patterns of disease, genetic relationships, activity patterns, diet, burial practices, human evolution. New scientific techniques available include DNA and stable isotope analyses.

Diseases which yield ancient DNA – leprosy, syphilis, tuberculosis, mycobacterium bovis (animal form of TB passed to humans when they shared a living space from Neolithic period onwards). Cremation destroys the crown of the tooth so it cannot be dated (the closure of the cranium vault can be used in adults for dating instead). Cremation also fragments bone, distorts it due to lack of water, shrinks the bone, causes microstructural alteration and destroys organic components (so DNA analysis not possible).

The final placing of the remains after scientific study and analysis will be agreed beforehand.

Further guidance is available in:

"Guidance for best practice for treatment of human remains excavated from

Christian burial grounds in England", The Church of England and English Heritage, 2005 (www.english-heritage.org.uk/upload/pdf/16602_HumanRemains1.pdf)

"Church Archaeology: its care and management", Council for the Care of Churches, 1999

The Advisory Panel on the Archaeology of Christian burials in England can provide free well-informed advice with consideration of relevant religious, ethical, legal, archaeological and scientific issues. Panel's website:

http://www.britarch.ac.uk/churches/humanremains/index.html

or email the secretary simon.mays@english-heritage.org.uk

4 Treasure

Defined as:

• Any metallic object, other than a coin, provided that at least 10% by weight of metal is precious metal and that is at least 300 years old when found

• Any group of two or more metallic objects of any composition of prehistoric date that come from the same find

• All coins from the same find provided that they are at least 300 years old when found, but if the coins contain less than 10% gold or silver there must be at least ten

• Any object, whatever it is made of, that is found in the same place as, or had previously been together with, another object that is Treasure

• Any object that would previously have been treasure trove, but does not fall within the specific categories given above. Only objects that are less than 300 years old, that are made substantially of gold or silver, that have been deliberately hidden with the intention of recovery and whose owners or heirs are unknown will come into this category

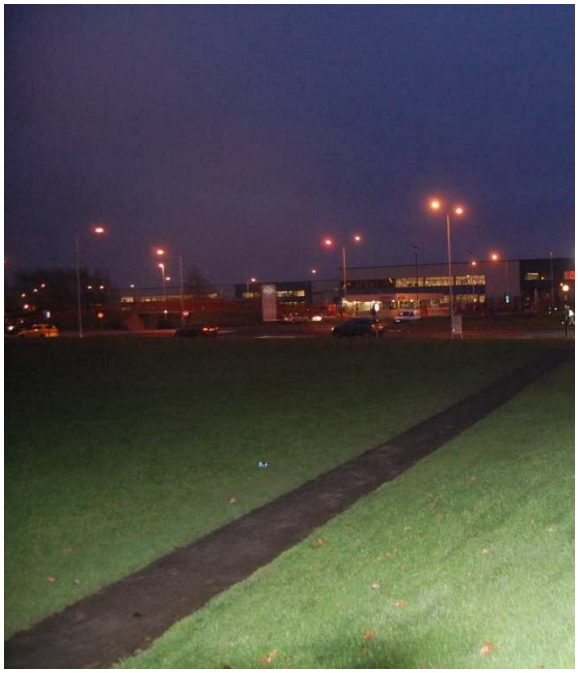
If anything is found which could be Treasure, under the Treasure Act 1996, it is a legal requirement to report it to the local coroner within 14 days of discovery. The Archaeological Contractor must comply with the procedures set out in The Treasure Act 1996. Any treasure must be reported to the coroner and to The Portable Antiquities Scheme Finds Liaison Officer, Rob Collins (0191 2225076 or Robert.Collins@newcastle.ac.uk) who can provide guidance on the Treasure Act procedures.

If you need this information in another format or language, please contact

Jennifer Morrison, Archaeology Officer.

APPENDIX 3: FIGURES

ACCESS ROAD TO A1290, NISSAN WORKS, WASHINGTON ROAD, USWORTH, TYNE AND WEAR



PRELIMINARY EVALUATION REPORT

CP. NO: 1016/09

16/12/2009

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Quality Assurance

This report covers works as outlined in the brief for the above-named project as issued by the relevant authority, and as outlined in the agreed programme of works. Any deviation to the programme of works has been agreed by all parties. The works have been carried out according to the guidelines set out in the Institute for Archaeologists (IfA) Standards, Policy Statements and Codes of Conduct. The report has been prepared in keeping with the guidance set out by North Pennines Archaeology Ltd on the preparation of reports.

REVISION SCHEDULE			
	01	**02**	**03**
PREPARED BY: **POSITION:** **DATE:**	Tony Liddell Supervisor 16/12/2009		
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In December 2009, North Pennines Archaeology Limited undertook an archaeological evaluation on land off the A1290 by the Nissan Works at Washington, Sunderland, Tyne and Wear (NGR: NZ 340 588). This was at the request of MDA Developments Ltd, and was in advance of the submission of a planning application for a sustainable manufacturing centre by Gateshead College (Planning Application 09/02486/FUL).

The town of Washington is situated approximately 9km to the west of Sunderland, on the north side of the River Wear. The Nissan factory is located between Sunderland and Washington, on the west side of the A19 and to the north of the A1231, and the development site is directly north of the factory. The development site lies within an area formerly occupied by an airfield constructed in 1916. Hylton or West Moor Airfield was a Flight Station for 'B' Flight of 36 Squadron. In 1917, the airfield was renamed 'Usworth' and was used by 'A' Flight. Previous archaeological research into the site revealed that there were still buildings associated with this early airfield in 1934, with further buildings present throughout the Second World War and into the 1950s. In accordance with PPG16 and UDP Policy B14 a programme of archaeological evaluation was required to ascertain if any trace of these buildings survive.

The field evaluation consisted of four trial trenches, located to target specific remains of buildings from the First World War airfield: the Main Stores, Motor Transport Sheds and Office and the Workshops.

The trenching revealed a relatively uniform stratigraphy, with natural clay underlying all trenches at an average height of 32.83mOD. All trenches contained a modern 20th century deposit overlying the natural substrate, the top of which averaged a datum height of 33.14m. This deposit indicates the level taken during the clearance of the site with any remains of the airfield buildings removed to this depth or below. This deposit also represents the depth of overburden stripped to during the building of the Nissan Works, when the development site was used as a storage and work area: this is demonstrated by the modern crushed hardcore observed in both Trenches C and D. Trench C also showed the use of hardcore to create the landscaped bunds in the northern extent of the site, indicating that the bunds are simply landscape features rather than the remains of earlier airfield buildings.

In Trench A, a concrete drain was uncovered in the northeast corner of the trench set within the modern backfill. While this could be a remnant of the drainage system from the airfield, it is more likely to be part of a drainage system set up while the area was used as a working compound for the construction of the Nissan Works. Trench B revealed a highly truncated concrete wall footing, which bears no relation to the potential remains of the Main Stores which the trench was targeting. However, the alignment does match with the edge of the road to the east of the building, perhaps indicating that the lowest remains of the road edging still remain *in-situ*.

Overall, the trenching revealed that no remnants of the buildings targeted remain in the evaluation area, with concrete footing remains minimal at best, with the majority removed during the 1980s when the area was used as a compound during the construction of the Nissan Works to the south.

The North-East Regional Research Framework 'Shared Visions' notes that there are relatively few World War I remains in the north-east.. The Research Agenda and Strategy in this publication notes that 'remains relating to the First World War must be recorded, and that full recording is necessary of all 20th century military and defence remains where they are affected by development work'. While it is clear from the previous deskbased assessment that the development area was in use during the First and Second World Wars, the remains of the buildings from that period have been destroyed and removed during the 1980s.

ACKNOWLEDGEMENTS

North Pennines Archaeology Ltd would like to thank MDA Development Ltd for commissioning the project.

NPA Ltd would also like to thank Jennifer Morrison, Archaeology Officer for Newcastle City Council, for all her help and assistance throughout the project.

The archaeological evaluation was undertaken by Tony Liddell and Michael McElligott, with the help of machine-driver John Thralkeld. The trenches were surveyed by Matthew Town and Helen Noakes. The report was written and the drawings produced by Tony Liddell. The project was managed by Frank Giecco, Technical Director for NPA Ltd. The report was edited by Martin Railton, Project Manager for NPA Ltd.

1 INTRODUCTION

1.1 CIRCUMSTANCES OF THE PROJECT

1.1.1 In December 2009, North Pennines Archaeology Limited undertook an archaeological evaluation on land off the A1290 by the Nissan Works at Washington, Sunderland, Tyne and Wear College ([NGR: NZ 340 588]; Figure 1). This was at the request of MDA Developments Ltd, and was in advance of the submission of a planning application for a sustainable manufacturing centre by Gateshead.

1.1.2 The town of Washington is situated approximately 9km to the west of Sunderland, on the north side of the River Wear. The Nissan factory is located between Sunderland and Washington, on the west side of the A19 and to the north of the A1231, and the development site is directly north of the factory.

1.1.3 The development site lies within an area formerly occupied by an airfield constructed in 1916. Hylton or West Moor Airfield was a Flight Station for 'B' Flight of 36 Squadron. In 1917, the airfield was renamed 'Usworth' and was used by 'A' Flight. Previous archaeological research into the site revealed that there were still buildings associated with this early airfield in 1934, with further buildings present throughout the Second World War and into the 1950s (Wooler 2009). In accordance with PPG16 and UDP Policy B14 a programme of archaeological evaluation was required to ascertain if any trace of these buildings survive.

1.1.4 This report sets out the results of the work in the form of a short document outlining the findings, followed by a statement of the archaeological potential of the area, an assessment of the impact of the proposed development, and recommendations for further work.

2 METHODOLOGY

2.1 ARCHAEOLOGICAL BRIEF

2.1.1 A *Specification for Preliminary Archaeological Evaluation at Land off access road to A1290, Nissan, Washington Road, Usworth* (Morrison 2009) was produced by Newcastle City Council and a subsequent trench location plan submitted by North Pennines Archaeology Limited on behalf of the client, MDA Developments Limited, for an archaeological evaluation of the development area. The specification and trench location was agreed upon in consultation with the Archaeology Officer for Newcastle City Council.

2.1.2 Following acceptance of the trench location plan by Newcastle City Council, North Pennines Archaeology Ltd was commissioned by MDA Developments Ltd to undertake the work. The specification and trench location plan was adhered to in full, and the work was consistent with the relevant standards and procedures of the Institute for Archaeologists (IfA), and generally accepted best practice.

2.2 ARCHAEOLOGICAL EVALUATION

2.2.1 The field evaluation consisted of four trial trenches, with Trench A measuring 10.0m in length by 1.60m in width, and Trenches B-D 5.0m in length by 3.0m in width. The trenches were located to target specific remains of buildings from the Second World War airfield: the Main Stores, Motor Transport Sheds and Office and the Workshops.

2.2.2 The location and size of the trial trenches were agreed by consultation between North Pennines Archaeology Ltd and Jennifer Morrison, Archaeology Officer for Newcastle City Council.

2.2.3 The aims of the evaluation can be summarised as follows:

- to establish the presence/absence, nature, extent and state of preservation of archaeological remains and to record these where they are observed;
- to establish the character of those features in terms of cuts, soil matrices and interfaces;
- to recover artefactual material, especially that useful for dating purposes;
- to recover palaeoenvironmental material where it survives in order to understand site and landscape formation processes.

2.3 METHODOLOGY

2.3.1 The trenches were located using Trimble Zeiss 3601 Total Station survey using coordinates from the trench location plan.

2.3.2 The trenches were excavated by a mechanical excavator equipped with a toothless 1.6m wide ditching bucket, under archaeological supervision, to the top of the natural substrate. Each trench was then manually cleaned and any putative archaeological features investigated and recorded according to the North Pennines Archaeology Ltd standard procedure as set out in the NPA Excavation Manual (Giecco 2003).

2.3.3 A photographic record was made using digital photography, 400 ISO Black and White print and 200 ISO Colour Slide film.

2.3.4 All work was undertaken in accordance with the Institute for Archaeologists Standards and Guidance for Archaeological Field Evaluations (IfA 2008).

2.4 THE ARCHIVE

2.4.1 A full professional archive has been compiled in accordance with the specification, and in line with current UKIC (1990) and English Heritage Guidelines (1991) and according to the Archaeological Archives Forum recommendations (Brown 2007). The archive, including the physical and paper archive and copies of the report, will be sent to Tullie House, Carlisle, and will be made available upon request. The archive can be accessed under the unique project identifier NPA09, GCN-A, CP 1016/09.

2.4.2 North Pennines Archaeology supports the **O**nline **A**cces**S** to the **I**ndex of Archaeological Investigation**S** (**OASIS**) project. This project aims to provide an on-line index and access to the extensive and expanding body of grey literature, created as a result of developer-funded archaeological work. As a result, details of the results of this project will be made available by North Pennines Archaeology, and can be accessed under the unique identification number *northpen3- 69355*.

3 BACKGROUND

3.1 LOCATION AND GEOLOGICAL CONTEXT

3.1.1 The city of Sunderland is located in the north-east of England, approximately 16km to the south-east of Newcastle upon Tyne and c.14km to the north-east of Durham. The town of Washington is situated approximately 9km to the west of Sunderland, on the north side of the River Wear. The Nissan factory is located between Sunderland and Washington, on the west side of the A19 and to the north of the A1231.

3.1.2 The topography of the area in and around Sunderland is determined by the geological structure. The strata found in the area are carboniferous coal measures and deposited Permian limestone overlay by glacial drift and alluvium. This limestone overlay rises in a more or less gentle slope under its blanket of glacial drift from the coast to a western escarpment about 500ft above sea level (Countryside Commission 1998).

3.2 HISTORICAL CONTEXT

3.2.1 *Introduction:* this historical background is compiled from the Desk Based Assessment (Wooler 2009) and is intended only as a summary of historical developments specific to the study area.

3.2.2 The place name Usworth is thought to stem from the Old English "burn by Osa's road".

3.2.3 ***Prehistoric Period (pre c.AD 43)***: no prehistoric activity located close to the proposed development area was noted in material consulted for the Desk Based Assessment. The Archaeological Data Service, however, contains an entry in its online catalogue for a possible prehistoric or Roman rectilinear site within an oval enclosure at grid reference NZ 333 90, to the north-west of Usworth airfield, between the Three Horse Shoes and North Moor Farm.

3.2.4 In the nearby vicinity, evidence for human settlement and activity in the Hylton area comes largely from findspots. In 1885 a dug-out canoe was found in the bed of the River Wear at Hylton. A second similar canoe was already known to Sunderland Museum as they had in their collection a photograph showing a fragmentary example. This canoe was believed to have been dredged from the River Wear between Hylton Dene and Southwick. The two canoes are suggested to have dated to the late Bronze Age or the Iron Age. Other prehistoric finds within the locality of Hylton include a bronze socketed axe from the Wear and two late Bronze Age swords from the Wear at Ford. The axe and two swords (which are of the Park Ewart type) are considered to be c.900-700BC.

3.2.5 In the wider landscape, prehistoric activity is evidenced by Bronze Age burials at Humbleton Hill and Hastings Hill, and Mesolithic and Neolithic flints and arrowheads have been found at Grindon, all on the south side the River Wear. Mesolithic to late Bronze/early Iron Age occupation have been discovered at Bishopwearmouth, also on the south side of the Wear, and prehistoric burials and enclosures are known at Fulwell and Carley Hill on the north side of the river, and to the east of Hylton.

3.2.6 ***Romano-British Period (c.AD 43-400)***: in 1939, a hoard of Roman coins were found at Washington Station. The hoard contained 59 coins including one minted during the reign of Emperor Constantine (possibly 4th century AD). There is no evidence as yet for activity during this period in close proximity to the proposed development area although the cropmarks already referred to may date to this period. It has been mentioned by Mr Fulton at the North East Aircraft Museum, that 'Roman remains' were found during preparatory work for the construction of the Nissan plant on the former airfield. No written confirmation of this has, however, been found during the desk-based assessment.

3.2.7 The main evidence for occupation of the area around Sunderland during this period is in the form of burials and coins. In 1759 a cist containing a large skeleton was uncovered at Fulwell during limestone quarrying. Two coins dating from the beginning of the 3rd century were found close by. To the north, near the Carley Hill quarry, a bronze figurine of Jupiter Dolichenus, a Romano-British god, was discovered in 1820. In 1971 the hill also yielded two Roman coins dating from the 2nd to the 3rd centuries. To the west at Southwick quarry, pieces of Roman pottery, including the remains of a late 4th century cooling pot were found in 1927. Coins from the period have also been found at and around Hylton, as well as a possible Roman milestone inscribed with a dedication to the Emperor Gordian (AD 238-44) found in the Wear and recorded by the prominent antiquarian, Robert Surtees, although its exact find spot is unknown.

3.2.8 ***Early Medieval Period (c.AD 400-1066)***: the only evidence for activity or settlement during this period comes from place names, as already referred to in 3.2.2 above. What is now known as Tyne and Wear was certainly an important area during this period as show by early Christian sites such as Jarrow (HER 1227), Tynemouth (HER 124-9) and Monkwearmouth which was founded by Bishop Bishop in 674AD (HER 87). There is no evidence of activity during this period in close proximity to the proposed development area, although as with earlier periods this does not mean a total absence of settlement or land use.

3.2.9 ***Medieval Period (c.AD 1066-1485)***: there is no evidence of medieval activity in the vicinity of the proposed development area. It is possible that the land may have been on the edges of Hylton Castle estate, and may have been waste, common or agricultural in nature.

3.2.10 Hylton Castle, located to the east of the proposed development area and now surrounded by housing, was built by Sir William Hylton as a gatehouse style fortified manor house. Although no construction records survive, the style of the architecture and coats of arms on the west front mean that it dates to the 1390s or the first decade of the 1400s. Other buildings may have existed on the site at this time, as the inventory taken on Sir William's death in 1435 mentions a hall, four chambers, two barns, a kitchen and the chapel in addition to the castle. Early in the 18th century, Baron John Hylton made the first major alterations. He completely redesigned the interior and inserted large windows in the fashionable Italianate style. His son, John, made even greater alterations. He built a south wing and added crenallations to both wings. When he died in 1746, the Hyltons sold the castle, as there was no male heir to inherit it. Successive owners failed to maintain it, and in 1863 it was bought by William Briggs, who knocked down the north and south wings, gutted the interior and added new windows. The chapel at Hylton Castle, dedicated to St Catherine, is known to have existed on the site since 1157, when it was likely that Hylton Castle was a wooden building. Nothing remains of the first chapel and the ruins seen today date from the early 15th century.

3.2.11 Like the rest of Monkwearmouth parish, Hylton had presumably been part of the lands of the Anglian monastery, but after the Norman Conquest it did not pass with the other townships to the priory's monastic cell. From the 12th century, and perhaps earlier, the manor and township of Hylton belonged to the Hilton family who took their name from the estate. There is evidence that there was a mill at Hylton by the late 12th century, although its precise location if unknown. If it was a watermill if may have stood at Hylton Dene. In later centuries a windmill was sited to the north of the castle.

3.2.12 ***Post-Medieval Period (c.AD 1485-1900)***: writing in 1967, Bennett refers to the 'Blackwood' located beside Usworth Aerodrome, as providing some idea of what the countryside was like in the area before any clearance was undertaken, although the exact location of the 'Blackwood' does not appear to be shown on any historical mapping. He noted that the land between Biddick Forest and the Three Horse Shoes was drained in 1820. Oak was mainly grown in Biddick Forest, and for centuries it was exported from Sunderland port, providing a considerable trade in hardwood as well as coal.

3.2.13 Nearby Hylton Castle was the site of skirmishes during the Civil War in the middle of the 17th century. Corfe noted that these skirmishes took place on high ground to the north of the castle in 1644.

3.2.14 Industries along the Wear appear to have been well established by the early 19th century. Parson and White refer to industry at Southwick (1¼ miles north-west of Sunderland and to the east of Hylton) on the north bank of the river, which included several shipyards, lime-kilns and earthenware and glass manufactories. The trade directory in Parson and White lists the trades in the township of Hylton in 1828, these appear to be more agricultural in nature rather than industrial, apart from Auston Dixon & Co, earthenware manufacturers at Hylton Ferry and Robert Reay, shipbuilder and timber merchant at the same location. Farms such as Cow Stand (occupied by Marmaduke Robinson), West Moor (Thomas Reed) and South Moor (George and James Curry), all previously located within close proximity to the proposed development area, were all in existence at this date. The Three Horse Shoes is listed as occupied by John Merriman, victualler and blacksmith, at 'Road Stone' in Hylton township; this may be an earlier name for the site although it is not shown on later mapping. North Hylton appears to have been more industrial than the rest of the township, no doubt due to its proximity to the river. Brett refers to industries such as iron ore (on land close to the ship building yards); charcoal; lamp black; grindstones and whetstones (North Hylton had quarries that yielded grindstones in the 17th and 18th centuries) which were exported all around the world; sandstone quarried from sites such as Wood House at North Hylton; tar; a pottery had been established at North Hylton in 1762 by the Maling family. The Malings had been Huguenot refugees who settle in Scarborough before moving to Sunderland. Rich clay beds and the riverside location for east of transport on the Wood House estate made it an ideal site for a pottery. The outbreak of the Crimean War in 1854 signaled an upturn in industry in North Hylton. The old pottery building was turned into a forge and iron works and shipbuilding yards sprang up on vacant lots on the riverside.

3.2.15 With reference to Hylton Colliery (or Castletown Colliery), Brett noted that the Wearmouth Coal Company bought the Wear Steel Works, 36 acres of land and 190 workmen's cottage for £37 000. The company began work on sinking the first shaft in March 1897. In October 1900 the mine was still being developed but was still producing 500 tons of coal a day. Output almost doubled when Hylton was at its peak and the workforce topped the 1000 mark. In 1907 the coal company bought the whole of the 2000 acres Hylton Castle Estate including the castle. As they already owned the coal rights the purchase was made as an investment. In the late 1970s Hylton was one of a number of small Durham collieries which ceased mining coal, the

pit finally closed in July 1979. The colliery at Hylton (located approximately 2km to the south-east of the proposed development area) was not the only colliery site in the area; Usworth Colliery is shown on the Ordnance Survey map of 1921 (HER No. 365) and a colliery also existed at Boldon to the north which opened in 1862 and closed in 1982 (HER No. 2567). There does not appear to have been any collieries within close proximity to the proposed development area.

3.2.16 The mining of coal was greatly aided by the railways. The colliery at Usworth (NZ 315 584) was served by sidings alongside what became the North Eastern Railway line from Washington to Pelaw, ½ mile north of Usworth Station. Prior to the first locomotives, trucks on these sidings were almost certainly shunted by horses33. The Pontop and South Shields Branch of the North Eastern Railway was originally the Stanhope and Tyne Railway which opened in 1834 as the first public railway on Tyneside. It carried minerals from County Durham to the Tyne and passengers from South Shields to the Durham Turnpike (HER No. 2290). The Hylton, Southwick and Monkwearmouth Railway was formed in 1871 to develop industry on the north bank of the Tyne. It opened in 1876 between the NER line at Monkwearmouth and the NER's Tyne Dock-Consett line at Southwick Junction, although the latter connection was removed shortly after. Both the Pontop and South Shields Branch of the NER and the Hylton, Southwick and Monkwearmouth branch line are located to the west and the south of the proposed development site respectively. There was no evidence that any railway lines or associated features crossed the proposed development area.

3.2.17 ***Modern (1900-Present)***: the industrial nature of the area around Sunderland, such as shipbuilding and coal mining, meant that the town and its hinterland were obvious German targets during the First World War. In April 1916, for example, a Zeppelin passed over Seaham harbour and crossed over the colliery villages towards Washington. Fourteen explosive bombs and seven incendiary bombs were dropped within five minutes. The first bomb in Sunderland landed in a yard in Peacock Street. The Zeppelin then made its way towards Monkwearmouth goods yard, hitting North Bridge Street, the tramway sheds and the Workmen's Hall (Calvert Street). The greatest amount of damage was done to Fern Street, North Bridge Street and Victor Street.

3.2.18 As a consequence of Zeppelin raids on the area around Sunderland, an airfield was created outside the town in October 1916 as a Station for 'B' Flight of No. 36 Squadron. It was originally known as Hylton, although when it was being prepared it was known as West Town Moor. Due to the increase in German bombing, the Royal Flying Corps undertook the task of Home Defence, setting up a number of squadrons, with flights spread over

the length of the British coastline. The north-east was protected by No. 36 Home Defence Squadron, which was formed by Capt. R O Abercromby at Cramlington in February 1916. No. 36 Home Defence Squadron defended the coast between Whitby and Newcastle. The main base was at Cramlington, to the north of Newcastle, with flights being attached to Seaton Carew and Ashington, as well as Hylton. By August 1918 Hylton was in use by 'A' Flight and continued as such until the Armistice, when it was just beginning to become known as Usworth.

3.2.19 Following the end of the First World War, Usworth airfield reverted to non-flying use, as was the case with many First World War aerodromes. Usworth languished unused for over a decade, apart from at least one visit by Alan Cobham's Flying Circus, until it was re-activated on March 17th 1930. From this period, the flying field was located to the south side of the road between Washington and Sunderland, and ancillary buildings were located to the north. The airfield was designed to accommodate one squadron of the recently expanded Royal Auxiliary Air Force, No. 607 (County of Durham) Squadron. North Camp was provided with living quarters and dining facilities for Officers, NCOs and airmen. It was initially proposed to erect canvas Besoneaux Hangars on the South Camp, however these were rejected in favour of the erection of a large Lamella Hangar. The South Camp also housed the Squadron Office, pilot huts, armoury, photographic hut and bombing training aids. The firing butts were alongside the railway. On 24th 1934, the airfield was opened to the public on Empire Air Day; this attracted 1300 visitors with an estimated 5000 other spectators watching the flying displays form outside the airfield. Proceeds from the Empire Air Day went to the RAF Benevolent Fund. The Empire Air Day in 1937, as well as having flying demonstrations and aerobatics, also included the erection of a dummy fort near the southern perimeter of the airfield, which was the subject of 'attacks' by the Hinds of 103 Squadron with the Demons of No. 607 Squadron 'defending'.

3.2.20 In September 1939 work commenced on the laying of two concrete runways, as well as the expansion of the airfield to the south, east and west by taking in adjoining fields. The new 2800 feet (c.900m) long runway was laid northwest to south-east, with another of similar length on a north-south heading. A new perimeter track was laid out along the airfield boundary with eight dispersal pens, each capable of holding a twin-engined aircraft. There were also 34 hard standings for single-engined fighters. Three of the older Callender Hangers were dismantled, leaving the Lamella and a single Callender hangar opposite the main gate. Additional buildings were constructed between the airfield and the road. An Operations Room was built near the Lamella hangar; this was later supplemented by an

underground Battle Headquarters near the Cow Stand Farm corner of the airfield. On the North Camp side new accommodation blocks were erected for the expected large influx of personnel which included WAAFs. On both sides of the road numerous air raid shelters were constructed. To assist in the defence of the airfield a series of dispersed sites were set up over a wide area around the site; these included a searchlight camp at the top of Ferryboat Lane and small gunposts on the Birtley Road, above the old quarries at the bottom end of Boldon Bank and along the disused railway line towards North Hylton. At Downhill Farm a large gun site was set up, and a decontamination centre was constructed well away from the airfield. During the Second World War, a watch tower was constructed on stilts on the roof of the Three Horse Shoes; the pub also acted as a Mess for Officers during this period.

3.2.21 In the publication *Archaeology of the Twentieth Century Defence Sites of Tyne and Wear: An Illustrated Guide*, several sites in and around the airfield at Usworth are listed. Of particular interest are the Pickett-Hamilton Forts, which were a form of pillbox unique to airfields, and which were often placed down the very centre of the runway. Pickett-Hamilton Forts were sunken, circular reinforced concrete pillboxes which remained flush with the airfields surface to permit the free movement of aircraft. If there was a threat of attack, however, the forts would be raised by a hand operated hydraulic jack and manned with guns.

3.2.22 Sunderland and its surrounding area did not escape bombing during the Second World War. The first bombs dropped on the district fell soon after midnight on the 22nd June 1940. Areas affected included buildings at the Old Rectory at Whitburn, a field near Church Lane and The Bents, and the Fishermen's Cottages, which narrowly escaped being demolished. An incendiary bomb fell onto Hylton Dene, 100 yards from Hylton Colliery, Castletown.

3.2.23 The airfield at Usworth had the distinction of being singled out for a major Luftwaffe attack during the Battle of Britain. On August 15th 1940, German aircraft were detected approaching the east coast of Britain. Spitfires from 72 Squadron Ackington met them off the Farne Islands, and although heavily outnumbered, several German aircraft were destroyed. The German formation then split in two, one portion making for Tyneside, while the other turned south. The Second Acklington Squadron, No. 79, encountered the northern group just off the coast and a wild dog-fight ensued. Reforming, the Hurricanes caught up with the bombers approaching Newcastle, where their primary objective would appear to have been Usworth. Harried by the Tyne guns and by more Hurricanes from Drem in

Scotland, the German 'Heinkels' made off, scattering their bombs with little effect, and leaving Usworth untouched.

3.2.24 For much of the Second World War, Usworth was used for training, with pilots of several nations stationed there, including Polish, Czech, Canadian, Australians, Americans and New Zealanders. The training of new pilots up to operational status was a hazardous activity with many aircraft damaged or destroyed during this period. Many of these pilots have their last resting place in Castletown cemetery near the airfield.

3.2.26 Following the end of the Second World War, Usworth was home to No. 31 Gliding School which had formed around 1944. The role of the Gliding School was to provide elementary flying training to cadets of the Air Training Corps from local squadrons in the north-east. In 1951 control of Usworth passed to No. 2 Basic Air Navigation School which disbanded in 1953 when control passed to Durham University Air Squadron. In 1958 the Gliding School, the University Air Squadron and the G.C.I aircraft were moved to RAF Ouston as Usworth was to close, although some limited use of the site was made by the Territorial Army for parachute training from tethered balloons. On 3rd July 1962, Usworth was bought by Sunderland Corporation for £27, 000 and reopened as Sunderland Airport.

3.2.27 Sunderland Corporation re-laid the runways and renovated the hangar, and in June 1963 Sunderland Flying Club came into being. On June 28th 1964 an Open Day and commemorative ceremony took place to celebrate the rebirth of what became Sunderland Airport. The Air Day in 1964 became an annual event with subsequent shows attracting greater participation. Sunderland Air Day in June 1981 attracted an estimated 50, 000 people to the airfield and surrounding hills. In the 1980s, 700 people a year made their first parachute jump at Sunderland Airport.

3.2.28 During the 1970s and 1980s, the collapse of manufacturing in the Sunderland area had a detrimental effect on employment. For example, over 34 000 jobs were lost between 1971 and 1981 alone. In the 1980s the economic outlook was bleak, although Sunderland enjoyed Development Area status and was eligible for maximum Urban Aid and EEC grants. The co-ordinated efforts of Sunderland Borough, Tyne and Wear Council, Washington Development Corporation and the government scored a major success in 1984 when they succeeded in attracting Nissan to build its new UK factory on Wearside. The massive Nissan plant was constructed on the 297 acre site of Sunderland (Usworth) Airport.

3.3 PREVIOUS WORK

3.3.1 In 2005, Archaeological Services University of Durham (ASUD) undertook an archaeological desk-based assessment and archaeological monitoring at Nissan Wind Farm (NZ 339 579, to the south of the Nissan factory). The desk-based assessment noted that although there was no direct evidence for prehistoric or Roman activity in the development area the presence of activity in the surrounding vicinity indicated that an as yet unidentified resource has the potential to exist. It was also noted that the use of the site as an airfield in the First and Second World Wars suggested that the site may have undergone significant landscaping to provide a level area for aircraft to land and take off.

3.3.2 An archaeological desk-based assessment was undertaken by On Site Archaeology Ltd (OSA) of land at Nissan Factory Business Park (located between the Nissan factory and the A1231 to the south), Washington, in July 2007 . The work concluded that there was the possibility that buried remains were present on the site, which could date from any period between the early Bronze Age and the present day. It was noted that the remains may survive as features cut into the natural subsoil and would possibly be visible immediately below the topsoil and B-horizon. The top of the archaeology was suggested to be located between 0.2m and 0.5m below the present ground surface.

3.3.3 A geophysical survey was undertaken by Met Surveys in April 2008 at Turbine Business Park, on land to the north of the A1231. The survey covered an area of approximately 20 hectares which at the time was rough pasture. The site had been in agricultural use for the past 20 years and although there were no known sites within the area, it was considered that there was the potential for buried archaeological remains to exist. The survey results revealed no features of archaeological significance, although modern services were noted to run across the site as evidence by manholes. The remains of ridge and furrow were detected in some parts of the site indicating the past agricultural use of the land, but their nature (narrow, closely spaced and straight) suggested they were of relatively modern origin.

3.3.4 Following on from the geophysical survey undertaken by Met Surveys, On Site Archaeology (OSA) conducted an archaeological evaluation on the land at Turbine Park in August 2008. Features such as the ridge and furrow and areas of disturbed ground, highlighted by the geophysical results, were targeted with the evaluation trenches. The work concluded that despite sites apparently rural appearance, it was clear that the site had been heavily re-worked during the 20th century. For example, the central, western and

northern parts of the site had been used to dispose unwanted waste material from building, which may have originated from the construction of the airfield, the test track or the nearby road. In all cases the method of dumping was the same; the topsoil was removed, the 'fill' material was dumped and then the topsoil was reinstated. The only feature potentially older than the 20th century was found in Trench 1 and consisted of a shallow linear feature containing small fragments of white-glazed pottery of 19th or 20th century date. Interestingly, the areas of ridge and furrow apparently revealed by the geophysical survey, and tested by Trenches 6, 8, 9 and 10, were not found. In the cases of Trenches 6 and 8 the presence of respectively c.0.70m thick and a 1.5m thick layer of dumped material would have prevented the detection of any preserved ridge and furrow.

3.3.5 In June 2009, North Pennines Archaeology Limited were commissioned by MDA Consulting Ltd to undertake an archaeological desk-based assessment of the current development area prior to the submission of a planning application for a sustainable manufacturing centre by Gateshead College. The desk-based assessment revealed that the proposed development area appears to have been undeveloped until the construction of the airfield at Usworth in 1916. The land appears to have been agricultural in character, despite industrial activity within close proximity (for example, the various railway branch lines, collieries and brick works). The assessment also demonstrated that Usworth Airfield started life in October 1916 as a Flight Station for 'B' Flight of 36 Squadron, and was initially known as Hylton or West Town Moor. By 1917, when it was used by 'A' Flight, it was starting to be known as Usworth. For most of its wartime career Usworth was a training station. Aerial photographs from 1934 show buildings at the airfield were located on the site of the proposed development area, with the main entrance situated in the approximate location of the present footpath. A map of 1945 shows the extent of the buildings on the site at that date; although these were mostly constructed of timber it is likely these structures sat on brick or concrete footings. An aerial photograph dating to 1941/1942 showed two cropmarks located to the west of the proposed development area; it is not known if these relate to the airfield or are totally unrelated, but they may suggest earlier activity in close proximity to the airfield site.

4 EVALUATION RESULTS

4.1 INTRODUCTION

4.1.1 The trenches were excavated down to the natural substrate where possible, followed by further hand excavation of potential archaeological features allowing an examination of any prospective archaeological remains. Trench locations are depicted in Figure 2.

4.1.2 Plans and sections of Trenches A, B and D can be found on Figure 3, and a plan and section of Trench C can be found on Figure 4.

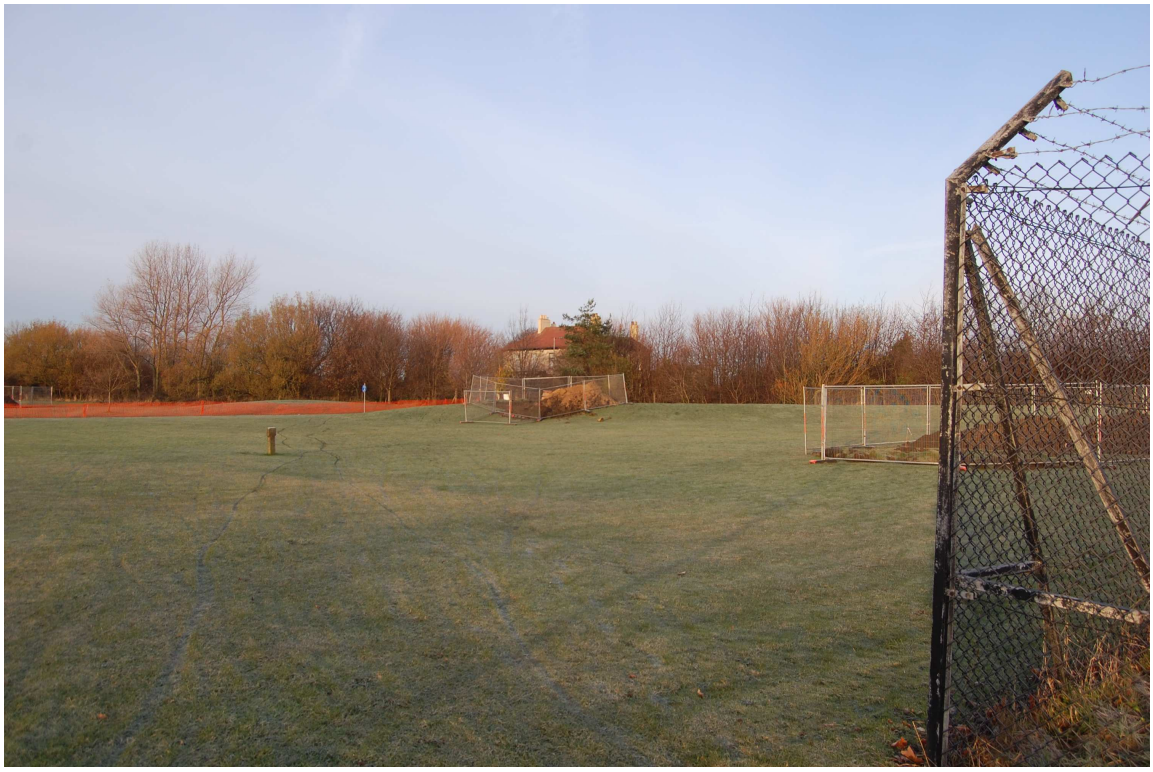

Plate 1. *The site looking northwest.*

4.2 TRENCH A

4.2.1 Trench A measured 10.00m in length and 1.60 in width, and was orientated roughly east-west.

4.2.2 The trench was located to evaluate the potential remains of the western and northern extensions of the Main Stores for the airbase, known to have been of timber construction.

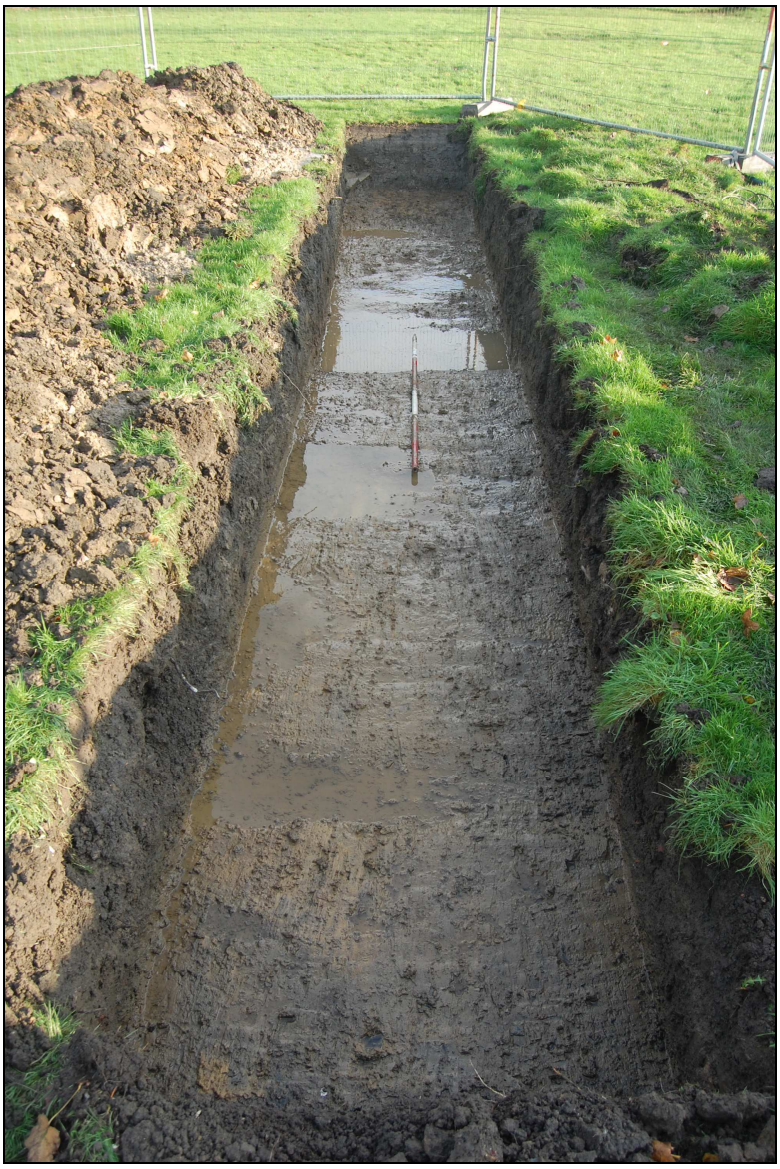

***Plate 2**. Trench A, looking east.*

4.2.3 The natural substrate, context (**102**), was found to be a compact orange/brown sandy clay averaging a depth of 0.68m below the current surface (and at an Ordnance Datum of 32.96m). Above the natural clay was a c.0.35m thick deposit of 20th century backfill, context (**104**), which was a compact mid-grey/brown silty clay with inclusions of small stones, concrete slivers and brick fragments. Above the backfill was a modern subsoil layer, context (**101**), which measured c.0.22m thick and was comprised of loose mid-brown sandy clay. Topsoil and turf, context (**100**), sealed the subsoil with an average depth of 0.14m.

4.2.4 In the north east corner of the trench the edge of a concrete drain, context (**108**), was uncovered aligned northwest-southeast, and sitting within the

modern backfill at 33.12mOD. This suggests that either the drain is not *in-situ*, or that the backfill context was laid at the same time as the drain, possibly as a packing 'foundation' layer for the building.

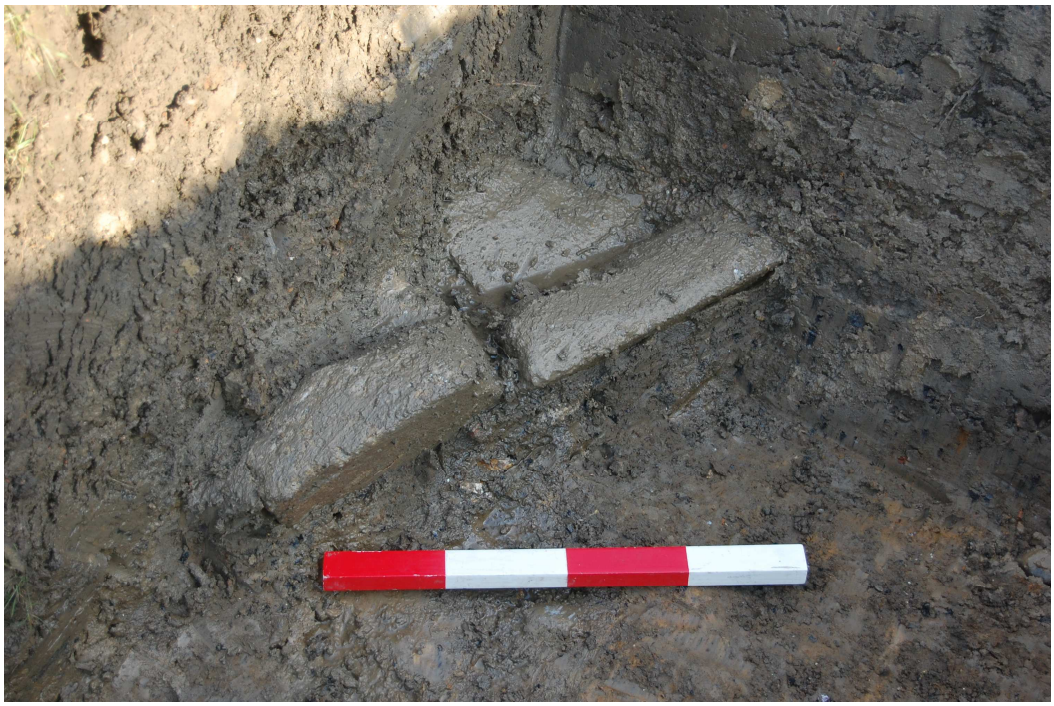

***Plate 3**. Drain (**108**) looking north-east.*

4.2.5 Fragments of late 20th century pottery and glass were recovered from context (**104**), with the other strata remaining artefactually sterile. No deposits were deemed suitable for environmental sampling.

4.3 TRENCH B

4.3.1 Trench B measured 5.0m in length and 3.0m in width, and was orientated roughly east-west .

4.3.2 The trench was located to evaluate the potential remains of the eastern extension of the Main Stores for the airbase, known to have been of timber construction.

4.3.3 The natural substrate, context (**102**), averaged a depth of 0.89m below the current surface (Ordnance Datum of 32.54m). Over the natural clay was a c.0.45m thick deposit of context (**104**), comprising 20th century backfill, above which was the modern subsoil layer, context (**101**), which measured c.0.22m

Topsoil and turf, context (**100**), sealed the subsoil with an average depth of 0.22m.

4.3.4 In the western extent of the trench was the remains of a concrete wall footing (**106**), aligned roughly northwest-southeast (Plate 5). The footing of the wall lay at 32.85m OD, measured 0.47m in width and spanned the width of the trench. The concrete lay on a thin deposit of context (**107**), a black ash and grit deposit which made up the lowest foundation strata of the wall remains.

4.3.5 Fragments of 20th century pottery and glass were recovered from context (**104**), with the other strata remaining sterile of artefacts. No deposits were deemed viable for environmental sampling.

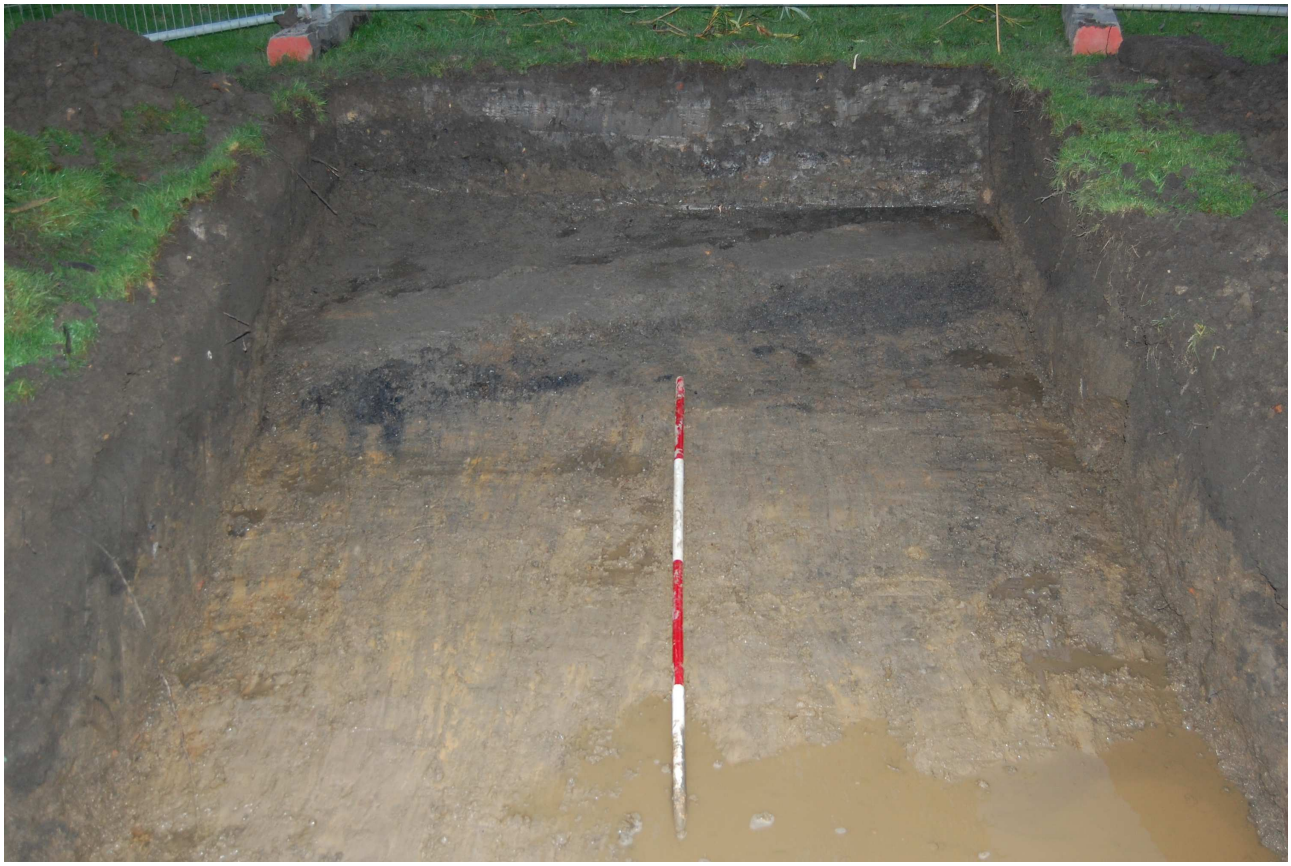

Plate 4. *Trench B, looking west.*

***Plate 5**. Wall footing (106), looking north.*

4.4 TRENCH C

4.4.1 Trench C measured 5.0m in length and 3.0m in width, and was orientated roughly north-south on the crest of a bund bordering the north side of the plot of land to the east of the dividing public path.

4.4.2 The trench was located to evaluate the potential remains of the Motor Transport Sheds and Office for the airbase, known to have been of timber construction.

4.3.3 In this trench, the natural substrate was not revealed due to the trench depth exceeding the reach of the mechanical excavator's bucket due to the trench's position on the bund. The depth excavated reached a vertical 2.02m, with the 20th century backfill layer, context (**104**), revealed 1.70m below the current surface. Over this layer was a 1.06m thick deposit of pale yellow crushed

hardcore, context (**103**), which formed the core of the bund's structure. Above the hardcore was a 0.27m thick deposit of modern subsoil, context (**101**), sealed by a 0.37m deposit of topsoil and turf, context (**100**).

4.3.4 Due to the highly unstable nature of the hardcore, the trench was stepped inwards and the deepest section of the excavation was not entered for recording purposes on Health and Safety grounds.

4.3.5 No artefactual or structural remains were recovered from this trench, and no deposits were deemed suitable for environmental sampling.

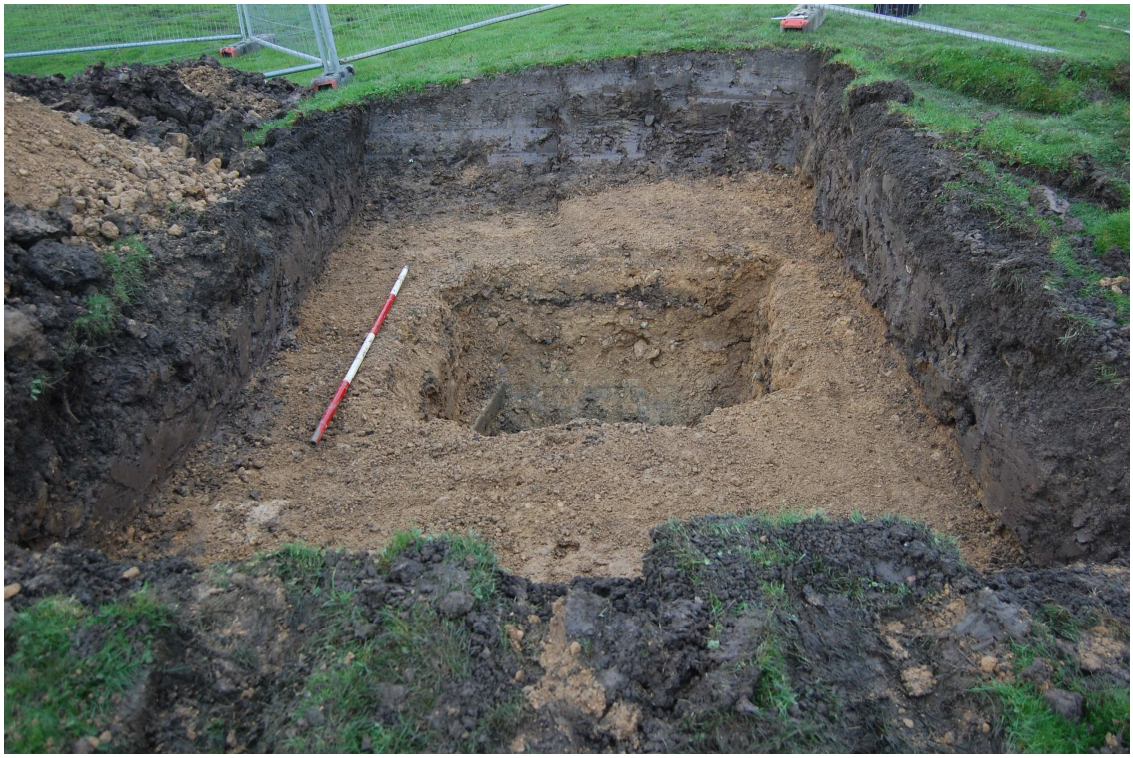

***Plate 6**. Trench C, looking south.*

4.5 TRENCH D

4.5.1 Trench D measured 5.0m in length and 3.0m in width, and was orientated roughly east-west in the eastern extent of the development area.

4.5.2 The trench was located to evaluate the potential remains of the main Workshops for the airbase, known to have been of timber construction.

4.3.3 The natural substrate, context (**102**), was found at a depth of c.0.75m below the current surface (and at an Ordnance Datum of 32.99m). Above the natural clay was a c.0.37m thick deposit of 20th century backfill, context (**104**). Above the backfill was a thin 0.06m thick deposit of pale yellow crushed hardcore, context (**103**), sealed by a c.0.17m thick layer of modern subsoil, context (**101**). As with the previous three trenches, Trench D was

sealed by topsoil and turf, context (**100**), measuring an average thickness of 0.11m.

4.3.4 At the south-western extent of the trench a concrete block, context (**105**), was found embedded in the natural clay. This block measured 0.64m in length, 0.31m in width and had a visible depth of 0.19m. The block was highly degraded, and although it could perhaps have been the remains of a concrete plinth or footing, it is more likely that it is a disturbed block pushed into the natural clay during the leveling of the site.

4.3.5 Fragments of early 20th century pottery were recovered from context (**104**), with the other strata remaining artefactually sterile. No deposits were deemed viable for environmental sampling.

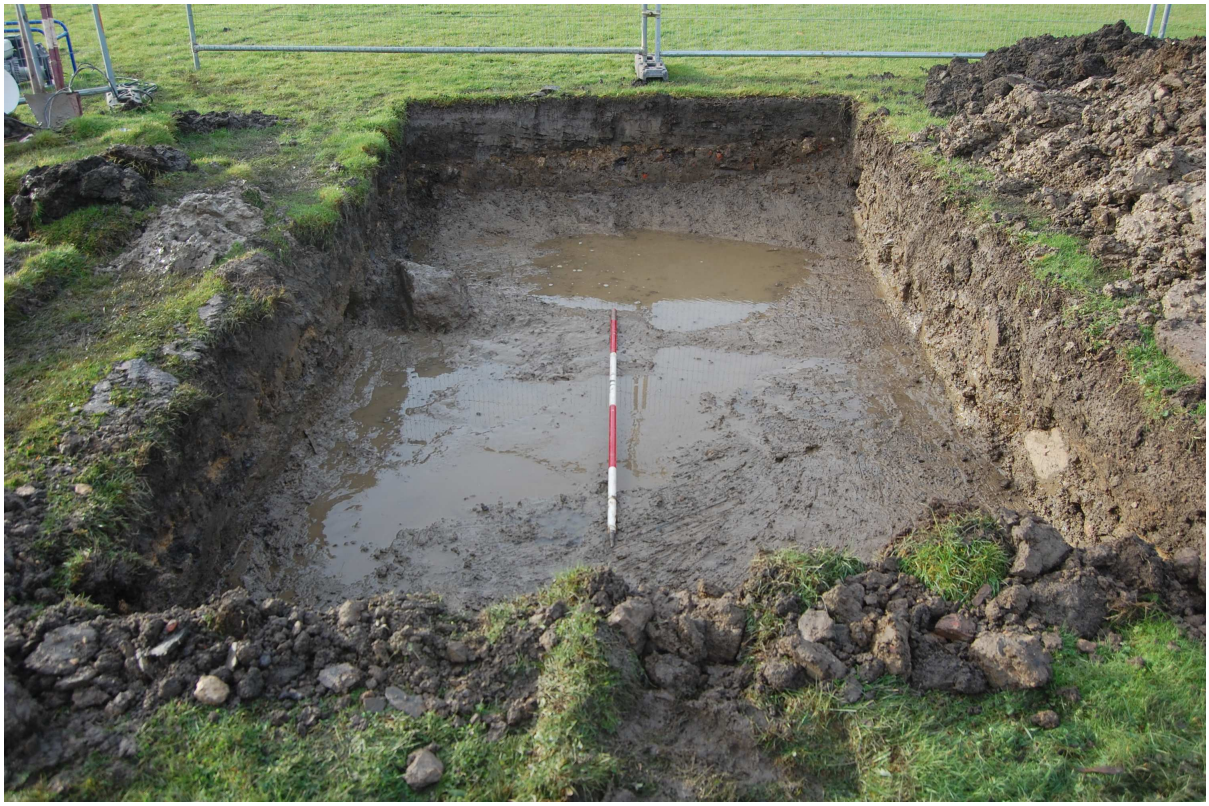

Plate 7. *Trench D, looking west.*

5 CONCLUSIONS AND RECOMMENDATIONS

5.1 CONCLUSIONS

5.1.1 The trenching revealed a relatively uniform stratigraphy, with natural clay underlying all trenches (this is assumed for Trench C) at an average height of 32.83mOD.

5.1.2 All trenches contained a modern 20th century deposit overlying the natural substrate, the top of which averaged a datum height of 33.14mOD. This deposit indicates the level taken during the clearance of the site with any remains of the airfield buildings removed to this depth or below. This deposit also represents the depth of overburden stripped to during the building of the Nissan Works, when the development site was used as a storage and work area: this is demonstrated by the modern crushed hardcore observed in both Trenches C and D. Trench C also showed the use of hardcore to create the landscaped bunds in the northern extent of the site, indicating that the bunds are simply landscape features rather than the remains of airfield buildings.

5.1.3 In Trench A, a concrete drain was uncovered in the northeast corner of the trench set within the modern backfill. While this could be a remnant of the drainage system from the airfield, it is more likely to be part of a drainage system set up while the area was used as a working compound for the construction of the Nissan Works.

5.1.4 Trench B revealed a highly truncated concrete wall footing, which bears no relation to the potential remains of the Main Stores which the trench was targeting. However, the alignment does match with the edge of the road to the east of the building, perhaps indicating that the lowest remains of the road edging still remain *in-situ*.

5.1.5 Overall, the trenching revealed that no timber remains of the buildings targeted remain in the evaluation area, with concrete footing remains minimal at best, with the majority removed during the 1980s when the area was used as a compound during the construction of the Nissan Works to the south.

5.2 RECOMMENDATIONS

5.2.1 The potential for archaeological remains within the development area remains low. Given the lack of any significant archaeological features during the evaluation it is recommended that no further work takes place.

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APPENDIX 1: CONTEXT TABLE

Context	Context Type	Description
(100)	Deposit	Modern topsoil and turf.
(101)	Deposit	Modern subsoil.
(102)	Natural Substrate	Yellow-brown compact sandy clay.
(103)	Deposit	Crushed hardcore in Trenches C and D.
(104)	Deposit	Modern backfill.
(105)	Deposit	Concrete block embedded in natural clay in Trench D.
(106)	Deposit	Concrete wall footing in Trench B.
(107)	Deposit	Packing material for wall footing (106).
(108)	Deposit	Concrete drain in Trench A.

***Table 1**. List of Contexts issued during the Evaluation*

APPENDIX 2: BRIEF

Tyne and Wear Specialist Conservation Team

Specification for Preliminary Archaeological Evaluation at Land off access road to A1290, Nissan, Washington Road, Usworth

Planning Application: 09/02486/FUL

Author:

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Tyne and Wear Archaeology Officer

West Chapel

Jesmond Old Cemetery

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Date: 3 September 2009

County Archaeologist's Reference Number: MON7453

The Tyne and Wear Specialist Conservation Team is the curatorial service for archaeology, industrial archaeology and historic buildings throughout the Tyne and Wear districts. It helps and advises Newcastle, Gateshead, North Tyneside, South Tyneside and Sunderland Councils to carry out their statutory duties to care for the precious historic environment of Tyneside and Wearside. The Team can be found at the Strategic Housing, Planning and Transportation Division of the Environment & Regeneration Directorate of Newcastle City Council.

Introduction

Site grid reference: NZ 340 588

Planning permission has been granted for a two storey office and teaching facility comprising of classrooms, lecture theatre, café, offices and learning resource centre. Attached to this will be a steel portal framed training facility for motor manufacturing and productivity. An

archaeological desk based assessment has been produced (North Pennines Archaeology Ltd, June 2009). The appointed archaeologist must familiarise themselves with the results of this previous archaeological work on the site before starting work.

The report concludes that the site was undeveloped until the construction of the airfield in 1916. Hylton or West Moor Airfield was a Flight Station for 'B' Flight of 36 Squadron. By 1917 it was used by 'A' Flight and was also known as Usworth. There were buildings associated with the airfield within the development site in 1934. They were probably timber buildings on brick or concrete footings. Buildings were present throughout World War Two and into the 1950s. A plan of 1945 identifies some of the buildings within the site as a fire tender garage, MT sheds, station offices and workshops.

The eastern part of the site has been landscaped. The western side is grassed with trees and also landscaped. In accordance with PPG16 and UDP Policy B14 a programme of archaeological evaluation is required to ascertain if any trace of these buildings survives.

Research Aims and Objectives

The evaluation report should make reference to Regional and Thematic Research Frameworks. The North-East Regional Research Framework for the Historic Environment (2006) notes the importance of research as a vital element of development-led archaeological work. It sets out key research priorities for all periods of the past allowing commercial contractors to demonstrate how their fieldwork relates to wider regional and national priorities for the study of archaeology and the historic environment. The aim of NERRF is to ensure that all fieldwork is carried out in a secure research context and that commercial contractors ensure that their investigations ask the right questions.

See http://www.algao.org.uk/Association/England/Regions/ResFwks.htm

Ideally and where possible the evaluation should cross-reference its aims and objectives to national priorities, defined in SHAPE (Strategic Frameworks for Historic Environment Activities and Programmes in English Heritage), and the English Heritage Research Agenda 2005-2010.

Where appropriate note any similar nationwide projects using ADS, internet search engines, ALSF website, HEEP website, OASIS, NMR excavation index. All staff on site must understand the project aims and methodologies.

Methods statement

Four evaluation trenches are needed to inform the Planning Authority of the character, nature, date, depth, degree of survival of archaeological deposits on this site. The excavation must be carried out by a suitably qualified and experienced archaeological organisation. The work will record and environmentally sample any

archaeological deposits of importance found on the plot. The purpose of this brief is to obtain tenders for this work. The report must be the definitive record for deposition in the Tyne and Wear HER, and it must contain recommendations for any further archaeological work needed on this site. The commissioning client needs to be aware that the purpose of the preliminary

evaluation is merely to ascertain if archaeological remains survive on this site and if they do, to determine their broad date, nature and function. Where archaeological remains are found in the preliminary trenches, and if these remains are at threat by the proposed development, further archaeological excavation and or a watching brief will be required before and during development work.

All staff employed by the Archaeological Contractor shall be professional field archaeologists with appropriate skills and experience to undertake work to the highest professional standards. The work will be undertaken according to English Heritage Guidelines – Managing Archaeological Projects 2nd Edition ('MAP2') 1991 (www.englishh.gov.uk/ guidance/ map2/ index.htm) and Management of Research Projects in the Historic Environment (MoRPHE) – The MoRPHE Project Managers' Guide, Project Planning Notes and Technical Guides 2006 (www.englishheritage.org.uk/publications).

The work will be undertaken according to MoRPHE Project Planning Notes 2006 - PPN3 – Archaeological Excavation and PPN6 – Development of Procedural standards and guidelines for the historic environment.

All work must be carried out in compliance with the codes of practice of the Institute of Field Archaeologists and must follow the IFA Standard and Guidance for Archaeological Field Evaluations, Excavation or Watching Briefs as appropriate. www.archaeologists.net

Notification

The County Archaeologist needs to know when archaeological fieldwork is taking place in Tyne and Wear so that he can inform the local planning authority and can visit the site to monitor the work in progress. The Archaeological Contractor must therefore inform the County Archaeologist of the start and end dates of the Evaluation. He must also keep the County Archaeologist informed as to progress on the site. The CA must be informed of the degree of archaeological survival and of any significant finds. The Client will give the County Archaeologist reasonable access to the development to undertake monitoring.

PROJECT INITIATION

PROJECT DESIGN

Because this is a detailed specification, the County Archaeologist does not require a Project Design from the appointed archaeologist. However a health and safety statement and risk assessment, identifying potential risks in a risk log (see template in appendix 2 of The MoRPHE Project Manager's Guide) and specifying suitable countermeasures and contingencies, is required to be submitted to the commissioning client.

The Management of Research Projects in the Historic Environment (MoRPHE) – The MoRPHE Project Managers' Guide 2006 contains general guidance on Risk management (section 2.3.2, Appendix 2).

Risk assessments must be produced in line with legislative requirements (for example the Health and Safety at Work Act 1974, the Management of Health and Safety at Work Regulations 1999, the Control of Substances Hazardous to Health (COSHH) Regulations 2002

and the Personal Protective Equipment at Work Regulations 2002) and best practice e.g. as set out in the SCAUM (Standing Conference on Archaeological Unit Managers) Health and Safety Manual http://www.scaum.org/uk

Detailed information on hazards and how to carry out a risk assessment can be obtained from the Health and Safety Executive (www.hse.gov.uk) and the local authority health and safety department.

Specific guidance for land contamination and archaeology can be obtained from the Institute for Archaeologists (www.archaeologists.net), the Construction Industry Research and Information Association (www.contaminated-land.org) and the Association of Geotechnical and Geoenvironmental Specialists (www.ags.org.uk). See also Environment Agency, 2005 "Guidance on Assessing the Risk Posed by Land Contamination and its Remediation on Archaeological Resource Management".

The Archaeological Contractor must be able to provide written proof that the necessary levels of Insurance Cover are in place. The Archaeological Contractor must detail measures taken to ensure the safe conduct of excavations, and must consult with the client's structural engineers concerning working in close proximity to the foundations of the surrounding buildings. The Client may wish to see copies of the Archaeological Contractor's Health and Safety Policies.

The Archaeological Contractor must maintain a Site Diary for the benefit of the Client, detailing the nature of work undertaken on a day by day basis, with full details of Site Staff present, duration of time on site, etc. and contact with third parties.

PROJECT EXECUTION

1) Archaeological evaluation

The appointed archaeological contractor will decide where best to put the trenches to avoid the most obviously landscaped parts of the site. The dimensions of the four trenches are each 1.5m x 20m in plan at base. The trenches will be located on the sites of former buildings as shown on the plan of 1945 (figure 10 in the desk based assessment).

A trench location plan will be sent to the Archaeology Officer for approval before starting work. Trench locations can be adjusted to avoid services or for practical or safety purposes. Trenches can be widened if feasible in order to step the sides to reach depths over 1.2m where necessary, otherwise shoring will be required. Trenches must avoid known services.

Trenches must stay a safe distance away from pylons and overhead power lines. The commissioning client will advise of any ecological or biodiversity issues which need to be taken into consideration. The commissioning client will advise of any protected trees which must be avoided by the evaluation. Damage to trees covered by a Tree Protection Order carries a substantial fine.

Trench positions should be accurately surveyed prior to excavation and tied in to the national grid. The trenches should be excavated to the depth natural subsoil if this can be reached safely.

Tasks

Hand excavation, recording and environmental sampling (as stipulated below) of deposits down to the depth specified above. Any modern overburden or levelling material can be machined-off using a wide toothless ditching bucket under strict archaeological supervision and the remaining deposits are to be excavated by hand. All faces of the trench that require examination or recording will be cleaned.

Excavation is to be carried out with a view to avoid damage to any archaeological features which appear to worthy of preservation in-situ. Excavation is to be carried out by single context planning and recorded on *pro-forma* context sheets. Features over 0.5 m in diameter can be half sectioned.

Environmental sampling (and where relevant scientific dating) are compulsory parts of the evaluation exercise. All tenders will give a price for the assessment, full analysis, report production and publication per environmental and scientific dating sample as a contingency.

Samples will be taken of bricks from any brick-built structures. The dimensions of the bricks and the type of bonding must be recorded. Scientific investigations should be undertaken in a manner consistent with "The Management of Archaeological Projects", English Heritage 1991 and with "Archaeological Science at PPG16 Interventions: Best Practice for Curators and Commissioning Archaeologists", English Heritage, 2003. Advice on the sampling strategy for environmental samples and samples for scientific dating etc. must be sought from Jacqui Huntley, English Heritage Regional Advisor for Archaeological Science (jacqui.huntley@english-heritage.org.uk or 07713 400387) before the evaluation begins. See Appendix 1 for more information.

See Appendix 2 for guidance on procedures relating to human remains.

See Appendix 4 for guidance on Treasure Act procedures.

The spoil can be kept close-by and rapidly backfilled into the trenches at the conclusion of this work.

Recording

A full written, drawn (accurate scale plans, elevations and section drawings) and photographic record (of all contexts in black and white print and colour transparency with clearly visible graduated metric scale) will be made. The finished report must include a plan and section of each trench (even where no archaeological remains are recorded) plus plans and sections through excavated archaeological features.

The plans will include at least two site grid points and will show section line end points.

The plans will depict building material (i.e. brick and stone) where a complex of structures has been found.

Where there is a complex of interlocking multi-phased structures, a phasing plan will also be included.

There will be elevation drawings of any standing structures such as walls.

Pro-forma context sheets will be used.

All deposits and the base of the trench will be levelled. Levels will be expressed as metres above Ordnance Datum.

Stratigraphy shall be recorded even when no archaeological features have been recognised.

A 'Harris' matrix will be compiled where stratified deposits are recorded.

2) Post-excavation and report production

Finds Processing and Storage

The Archaeological Contractor will process and catalogue the finds in accordance with Museum and Galleries Commissions Guidelines (1992) and the UKIC Conservation Guidelines, and arrange for the long term disposal of the objects on behalf of the Client. A catalogue of finds and a record of discard policies, will be lodged with the finds for ease of curation. Finds shall be recorded and processed in accordance with the IFA Guidelines for

Finds Work

Finds will be assessed by an experienced finds specialist. Human and animal bone assemblages should be assessed by a recognised specialist (see Appendices 2 and 3 for more information). Industrial slag and metal working debris will be assessed by a specialist. Assessment should include x-radiography of all iron objects (after initial screening to exclude recent debris) and a selection of non-ferrous artefacts (including all coins). Refer to "Guidelines on the x-radiography of archaeological metalwork, English Heritage, 2006.

Brick dimensions will be measured and a note made of the bonding material. If necessary, pottery sherds and bricks should be recommended for Thermoluminescence dating.

Finds processing, storage and conservation methods must be broadly in line with current practice, as exemplified by the IFA "Standard and guidance for the collection, documentation, conservation and research of archaeological materials", 2001. Finds should be appropriately packaged and stored under optimum conditions, as detailed in the RESCUE/UKIC publication "First Aid for Finds"

(Watkinson and Neal 1998). Proposals for ultimate storage of finds should follow the UKIC publication "Guidelines for the Preparation of Excavation Archives for Long-term Storage" (Walker 1990). Details of methodologies may be requested from the Archaeological Contractor.

Other useful guidance – "A Strategy for the Care and Investigation of Finds",

English Heritage, 2003, "Finds and Conservation Training Package", English Heritage, 2003.

All objects must be stored in appropriate materials and conditions to ensure minimal deterioration. Advice can be sought from Jacqui Huntley of English Heritage (07713 400387) where necessary.

PRODUCTS

The report

1. The Archaeological Contractor must produce an interim report of 200 words minimum, two weeks after the completion of the field-work, for the Client and the Planning Authority, with a copy for information to the County Archaeologist. This will contain the recommendations for any further work needed on site.

2. The production of Site Archives and Finds Analysis will be undertaken according to English Heritage Guidelines - Managing Archaeological Projects 2nd Edition ('MAP2') 1991 and Management of Research Projects in the Historic Environment (MoRPHE) 2006.

3. A full archive report or post-excavation assessment, with the following features should be produced within six months of the completion of the fieldwork. All drawn work should be to publication standard. The report must include:

* Location plans of trenches and grid reference of site

* Site narrative – interpretative, structural and stratigraphic history of the site

* Plans showing major features and deposit spreads, by phase, and section locations

* Sections of the two main trench axes and through excavated features with levels

* Elevation drawings of any walls etc. revealed during the excavation

* Artefact reports – full text, descriptions and illustrations of finds

* Tables and matrices summarising feature and artefact sequences.

* Archive descriptions of contexts, grouped by phase (not for publication)

* Deposit sequence summary (for publication/deposition)

* Colour photographs of trenches and of archaeological features and finds

* Laboratory reports and summaries of dating and environmental data, with collection methodology.

* A consideration of the results of the field-work within the wider research context (ref. NERRF).

* Recommendations for further work on site, or further analysis of finds or environmental samples

* Copy of this specification

4. Three bound and collated copies of the report need to be submitted:

• one for the commissioning client

• one for the planning authority (Sunderland City Council) – this must be formally submitted by the developer to the planning department with the appropriate fee.

• one for deposition in the County HER at the address below. A digital copy of the report on CD is also required by the HER in a plastic case. Please do not attach this to the report. The report and CD for the HER must be sent by the archaeological consultant or their client directly to the address below. If the report is sent via the planning department, every page of the report will be stamped with the planning application number which ruins the illustrations. The HER is also often sent a photocopy instead of a bound colour original which is unacceptable.

Publication

If significant archaeological features are found during the evaluation, the results may also warrant publication in a suitable archaeological journal. The tender should therefore include an estimated figure for the production of a short report of, for example 20 pages, in a journal such as Archaeologia Aeliana, the Arbeia Journal, Industrial Archaeology Review or Durham Archaeological Journal. This is merely to give the commissioning client an indication of potential costs. Before preparing a paper for publication, the archaeological contractor must discuss the scope, length and suitable journal with the County Archaeologist.

Archive Preparation and Dissemination

The archive should be a record of every aspect of an archaeological project – the aims and methods, information and objects collected, results of analysis, research, interpretation and publication. It must be as complete as possible, including all relevant documents, records, data and objects {Brown, 2007, 1}.

The site archive (records and materials recovered) should be prepared in accordance with Managing Archaeological Projects, Second Edition, 5.4 and appendix 3 (HBMC 1991), MoRPHE Project Planning Notes 2006 PPN3 – Archaeological Excavation, "Archaeological documentary archives" IFA Paper No. 1, "Archaeological Archives – creation, preparation, transfer and curation"Archaeological Archives Forum etc., Guidelines for the Preparation of Excavation Archives for Long Term Storage (UKIC 1990) and "Archaeological Archives – A guide to best practice in creation, compilation, transfer and curation" by Duncan H. Brown, Archaeological Archives Forum, July 2007.

Documentary Archive

The documentary archive comprises all records made during the archaeological project, including those in hard copy and digital form. This should include written records, indexing, ordering, quantification and checking for consistency of all original context sheets, object records, bulk find records, sample records, skeleton records, photographic records (including negatives, prints, transparencies and x-radiographs), drawing records, drawings, level books, site note-books, spot-dating records and conservation records, publication drafts, published work, publication drawings and photographs etc.

A summary account of the context record, prepared by the supervising archaeologist, should be included. All paper-based material must at all times be stored in conditions that minimise the risk of damage, deterioration, loss or theft. Do not fold documents. Do not use self-adhesive labels or adhesive or tape of any kind. High quality paper (low-acid) and permanent writing materials must be used.

Original drawings on film must be made with a hard pencil, at least 4H. Do not ink over original pencil drawings. Use polyester based film for drawings (lasts longer than plastic).

Store documents in acid-free, dust-proof cardboard boxes. Store documents flat. All documents must be marked with the project identifier (e.g. site code) and/or the museum accession number. All types of record must use a consistent terminology and format.

Use non-metal fastenings, and packaging and binding materials that ensure the longevity of documents. Copies of reports and appropriate drafts, with associated illustrative material, must be submitted for inclusion with the archive.

Material Archive

The material archive comprises all objects (artefacts, building materials or environmental remains) and associated samples of contextual materials or objects. All artefacts and ecofacts retained from the site must be packed in appropriate materials. All finds must be cleaned as appropriate to ensure their long-term survival.

All metal objects retained with the archive must be recorded by x-radiograph (except gold or lead alloys or lead alloys with a high lead content and objects too thick to be x-rayed effectively e.t.c.)

All finds must be marked or labelled with the project and context identifiers and where relevant the small-finds number. Use tie-on rot-proof labels where necessary. Bulk finds of the same material type, from the same context, may be packed together in stable paper or polythene bags. Mark all bags on the outside with site and context identifiers and the material type and include a polyethylene label marked with the same information.

Use permanent ink on bags and labels. Sensitive finds must be supported, where appropriate, on inert plastic foam or acid-free tissue paper. It is not advisable to wrap objects in tissue as the unwrapping could cause damage.

The archive will be placed in a suitable form in the appropriate museum (typically the Museum of Antiquities for Newcastle (stores in Bedson Building and at Team Valley) and Tyne and Wear Museums for the rest of Tyne and Wear (check with these institutions) with the landowner's permission. Contact Andrew Parkin at the Museum of Antiquities (0191 2228996) and Alex Croom at Tyne and Wear Museums (0191 4544093).

A letter will be sent to the County Archaeology Officer within six months of the report having been submitted, confirming where the archive has been deposited.

Digital Archive

See MoRPHE Technical Guide 1 – Digital Archiving & Digital Dissemination 2006.

SIGNPOSTING

OASIS

The Tyne and Wear County Archaeologist supports the Online Access to the Index of Archaeological Investigations (OASIS) project. This project aims to provide an online index/access to the large and growing body of archaeological grey literature, created as a result of developer-funded fieldwork.

The archaeological contractor is therefore required to register with OASIS and to complete the online OASIS form for their evaluation at http://www.oasis.ac.uk/.

Please ensure that tenders for this work takes into account the time needed to complete the form.

Once the OASIS record has been completed and signed off by the HER and NMR the information will be incorporated into the English Heritage Excavation Index, hosted online by the Archaeology Data Service.

The ultimate aim of OASIS is for an online virtual library of grey literature to be built up, linked to the index. The unit therefore has the option of uploading their grey literature report as part of their OASIS record, as a Microsoft Word document, rich text format, pdf or html format. The grey literature report will only be mounted by the ADS if both the unit and the HER give their agreement. The grey literature report will be made available through a library catalogue facility.

Please ensure that you and your client understand this procedure. If you choose to upload your grey literature report please ensure that your client agrees to this in writing to the HER at the address below.

For general enquiries about the OASIS project aims and the use of the form please contact: Mark Barratt at the National Monuments Record (tel. 01793 414600 or oasis@english-heritage.org.uk). For enquiries of a technical nature please contact: Catherine Hardman at the Archaeology Data Service (tel. 01904 433954 or oasis@ads.ahds.ac.uk). Or contact the Tyne and Wear Archaeology Officer at the address below.

The tender

Tenders for the work should contain the following:-

1. Brief details of the staff employed and their relevant experience

2. Details of any sub-contractors employed

3. A quotation of cost, broken down into the following categories:-

* Costs for the excavation, incl. sub-headings of staff costs on a person-day basis, transport, materials, and plant etc.

* Post-excavation costs, incl. storage materials

* Cost of Environmental analysis and scientific dating per sample

* Estimated cost for full publication of results in an archaeological journal

* Overheads

4. An indication of the required notification period (from agreement to start date) for the field-work; the duration of fieldwork and the expected date for completion of the post-excavation work (a maximum of 6 months after completion of the fieldwork)

Monitoring

The Archaeological Contractor will inform the County Archaeologist of the start and end dates of the excavation to enable the CA to monitor the work in progress. Should important archaeological deposits

be encountered, the County Archaeologist must be informed. If further archaeological evaluation is required on this site, then the archaeological contractor must submit a written scheme of investigation for approval by the CA before extending the size of the trenches.

APPENDICES

1 Environmental Sampling, Scientific Analysis and Scientific Dating

This is a compulsory part of the evaluation exercise. Scientific investigations should be undertaken in a manner consistent with "The Management of Archaeological Projects", English Heritage 1991 and with "Archaeological Science at PPG16 Interventions: Best Practice for Curators and Commissioning Archaeologists", English Heritage, 2003.

Aims of environmental sampling – to determine the abundance/concentration of the material within the features and how well the material is preserved, to characterise the resource (the site) and each phase, to determine the significance of the material and its group value, what crop processing activities took place on the site? What does this tell us about the nature of the site? Is there any evidence for changes in the farming practice through time? How did people use this landscape? Can we place certain activities at certain locations within the site?

Function and date of individual features such as pits, hearths etc. Are the charred assemblages the result of ritual deposition or rubbish? Is the charcoal the result of domestic or industrial fuel?

Advice on the sampling strategy for environmental samples and samples for scientific dating etc. must be sought from Jacqui Huntley, English Heritage Regional Advisor for Archaeological Science (07713 400387) before the evaluation begins. The sampling strategy should include a reasoned justification for selection of deposits for sampling.

Deposits should be sampled for retrieval and assessment of the preservation conditions and potential for analysis of biological remains (English Heritage 2002). Flotation samples and samples taken for coarse-mesh sieving from dry deposits should be processed at the time of fieldwork wherever possible. Sieving recovers fish, amphibian, small bird and mammal bone, small parts of adult mammals and young infused bones which may be under-represented otherwise. However it is noted that clay soils in this region make sieving difficult. Discuss the potential for sieving with Regional Advisor for Archaeological Science.

Environmental samples (bulk soil samples of 30-40 litres volume) will be collected by the excavator from suitable (i.e. uncontaminated) deposits. It is suggested that a large number of samples be collected during evaluation from which a selection of the most suitable (uncontaminated) can be processed. All tenders will give a price for the assessment, full analysis, report production and publication per sample. The full 30-40 litre sample must be assessed by the laboratory, not just a small sub-sample.

Deposits will be assessed for their potential for radiocarbon, archaeomagnetic (guidance is available in the Centre for Archaeology Guideline on Archaeometallurgy 2001) and Optically Stimulated Luminescence dating. Timbers will be assessed for their potential for dendrochronology dating. Sampling should follow procedures in "Dendrochronology: guidelines on producing and interpreting dendrochronological dates", Hillam, 1998. All tenders will quote the price of these techniques per sample.

The following information should be provided with the environmental samples to be processed – brief account of nature and history of the site, aims and objectives of the project, summary of archaeological results, context types and stratigraphic relationships, phase and dating information, sampling and processing methods, sample locations, preservation conditions, residuality/contamination etc.

Laboratory processing of samples shall only be undertaken if deposits are found to be reasonably well dated, or linked to recognisable features and from contexts the derivation of which can be understood with a degree of confidence.

A range of features, and all phases of activity, need to be sampled for charred plant remains and charcoal. Aceramic features should not be avoided as the plant remains from these features may help to date them. Deep features should be sampled in spits to pick up changes over time. Part, or all of each of the contexts should be processed. In general samples should be processed in their entirety. All flots should be scanned, and some of the residues.

Pollen

Pollen samples can be taken from features such as lakes, ponds, palaeochannels, estuaries, saltmarshes, mires, alluvium and colluvium, and from waterlogged layers in wells, ditches and latrines etc. Substances such as honey, beer or food residues can be detected in vessels. Activities such as threshing, crop processing and the retting of flax can be identified. When taken on site, pollen samples should overlap. Your regional science advisor can advise on the type of corer or auger which would be most appropriate for your site. Samples need to be wrapped in clingfilm and kept dark and cool. Make a description of the sediments in which the pollen was found, and send this with the sample to be assessed.

Forams and diatoms

Coastal or estuary sites (even those which are now well drained) are suitable for sampling for foraminifera. Diatoms can also be found on marine sites, but also in urban settings (sewers, wells, drains, ditches etc). They only survive in waterlogged conditions. These aquatic microfossils are used as proxy indicators of the former aquatic ecological conditions on site, changes in sea levels and temperature, salinity, PH and pollution. Forams are taken from cores, monolith tins or bulk samples. Diatoms are cut from monolith tins or cores or taken as spot

samples.

Insects

Insects, which are useful as palaeoenvironmental indicators, survive best in waterlogged deposits such as palaeochannels and wells. They can provide information on climate change and landscape reconstruction as some species are adapted to particular temperatures, habitats or even particular trees. Certain insects can indicate the function of a feature or building (eg. Weevils, which were introduced by the Romans, often indicate granary sites, parasites will indicate the presence of particular animals such as sheep or horse, latrine flies survive in the

mineral deposits in latrines, or in the daub of medieval buildings etc). Samples need to be sealed (eg. in a plastic box).

Industrial Activity

Where there is evidence for industrial activity, macroscopic technological residues should be collected by hand. Separate samples should be collected for microslags (hammer-scale and spherical droplets). Guidance should be sought from the English Heritage Regional Science Adviser on the sampling strategy for metalworking features and advice on cleaning and packaging. Specialist on-site advice must be sought on identification of metalworking features. Slag and metal working debris must be assessed by a specialist. Scientific analysis (such as x-ray fluorescence, chemical analysis, metallography or scanning electron microscope) of slag can provide information on the melting temperature, chemical composition (is it iron, zinc, copper etc), microstructure (the type and shape of the crystals), physical properties (the hardness or viscosity), isotopic composition (strontium_87 or strontium_88 etc) and mineralogical composition. Guidance is available in the English Heritage "Archaeometallurgy" guidelines, 2001; "Archaeomagnetic dating", 2006 and "Guidelines on the X-radiography of archaeological metalwork", 2006. See also Historical Metallurgy Society, 2008, "Metals and metalworking: a research framework for archaeometallurgy".

Buried soils and sediments

Buried soils and sediment sequences should be inspected and recorded on site by a recognised geoarchaeologist. Procedures and techniques in the English Heritage document "Environmental Archaeology", 2002 and "Geoarchaeology", 2004 should be followed.

Wood

Sampling strategies for wooden structures should follow the methodologies presented in "Waterlogged wood. Guidelines on the recording, sampling, conservation and curation of waterlogged wood" R. Brunning, 1996. If timbers are likely to be present on your site, contact a wood specialist beforehand. Preexcavation planning – determine questions to ask, agree on a sampling strategy, allocate reasonable time and budget. Soil samples should be taken of the sediments surrounding the timber. Keep the timbers wet! Record them asap onsite – plan, photograph, record the size and orientation of the wood (radial, tangential,transverse), any toolmarks, joints, presence of bark, insect damage, recent breaks, and if another piece of wood was on top of or below the piece sampled. Both vertical and horizontal positioning of wattling must be recorded. Wood samples can provide information on woodland management such as medieval coppicing, type of taxa (native or foreign), conversion technology (how the wood was turned into planks), building techniques and type of tools used. Suitable samples should be submitted for dendrochronological dating. See English Heritage guidelines, 2004, "Dendrochronology".

Leather and organic materials

Waterlogged organic materials should be dealt with following recommendations in "Guidelines for the care of waterlogged archaeological leather", English Heritage and Archaeological Leather Group 1995.

2 Animal Bone

Animal bone can explore themes such as hunting and fowling, fishing, plant use, trade network, seasonality, diet, butchery, animal husbandry, food procurement, age structures, farrowing areas, species ratios, local environment. Domestic animal bone was used in prehistoric and Roman cremation rituals. Post medieval cattle bones – small cow bones invariably represent animals which produced high quality buttermilk for cheese. Big 'improved' cattle with large bones were produced for large quantities of meat and poorer quality milk. Large and small cattle bones are often found together on post medieval sites, usually with less of the small bones.

Animal bone assemblages should be assessed by a recognised specialist. The specialist will need to know a brief account of the nature and history of the site, an account of the purpose, methods (details of sampling) for recovery of animal bones, and the main aims and results of the excavation, details of any specific questions that the excavator wants the animal bone specialist to consider, information about other relevant finds from the excavation (e.g. bone tools, fishing equipment, weaving equipment), specific information about each context that has produced significant quantities of animal bone (recovery method, phase, context type, position in relation to major structures, contamination by more recent material, some indication of the amount of bone (by weight or by container size). See "Ancient Monuments Laboratory Advisory Note, "Assessment of animal bone collections from excavations", Sebastian Payne, 1991and "The Assessment of a collection of animal bones", S. Davis, n.d., Ancient Monuments Laboratory.

Fish bone – there was some herring exploitation in the early medieval period. Christian fasting from around 970 allowed fish to be eaten on Fridays which led to a huge demand for fish. There was an increase in marine fishing, fish trade and fish consumption (cod, haddock, ling, herring etc) around 1000 AD. Middens provide evidence of commercial fishing. There was a decline in freshwater fish (cyprinid or carp, salmon, smelt, eel, pike) from the eleventh century.

Smoking fish is a recent practice. They were previously air dried and salted. Newcastle was a major port. Samples should be sieved to retrieve fish and bird bones along with small parts of other animal skeletons and young infused bones. A crane bone was recovered from excavations at Tuthill Stairs, Newcastle – a rare find. Herring bones are so small that they can only be retrieved by 2mm sieving. Clay soils are difficult to sieve, hot water can help. Acidic soils mean poor preservation of bone.

See English Heritage 2002, "Environmental Archaeology – a guide to the theory and practice of methods from sampling and recovery to post excavation", Centre of Archaeology Guideline 1. Isotope analysis can determine where the fish were coming from – North Sea, Scandinavia, Newfoundland, Iceland etc.

There is an excellent reference collection of fish bone at York. Fish bones should be archived to museums for future dating and isotope analysis where this is not undertaken as part of the post-excavation process.

www.fishlab.org

3 Human Remains

Human remains must be treated with care, dignity and respect. Excavators must comply with the relevant legislation (essentially the Burial Act 1857) and local environmental health concerns. If found, human remains must be left in-situ, covered and protected. The archaeological contractor will be responsible for informing the police, coroner, local Environmental Health department and the County Archaeologist. If it is agreed that removal of the remains is essential, the archaeological contractor will apply for a licence from the Home Office and their regulations must be complied with.

Site inspection by a recognised osteologist is desirable for isolated burials and essential for cemeteries. The remains will be recorded in-situ and subsequently lifted, washed in water (without additives). They will be marked and packed to standards compatible with "Excavation and post-excavation treatment of cremated and inhumed human remains", McKinley and Roberts, 1993. After excavation, the remains will be subject to specialist assessment. Analysis of the osteological material should take place according to published guidelines "Human Remains from Archaeological Sites, Guidelines for producing assessment documents and analytical reports, English Heritage, 2002.

Some of the potential benefits from the study of human skeletons – demography, growth profiles, patterns of disease, genetic relationships, activity patterns, diet, burial practices, human evolution. New scientific techniques available include DNA and stable isotope analyses.

Diseases which yield ancient DNA – leprosy, syphilis, tuberculosis, mycobacterium bovis (animal form of TB passed to humans when they shared a living space from Neolithic period onwards). Cremation destroys the crown of the tooth so it cannot be dated (the closure of the cranium vault can be used in adults for dating instead). Cremation also fragments bone, distorts it due to lack of water, shrinks the bone, causes microstructural alteration and destroys organic components (so DNA analysis not possible).

The final placing of the remains after scientific study and analysis will be agreed beforehand.

Further guidance is available in:

"Guidance for best practice for treatment of human remains excavated from

Christian burial grounds in England", The Church of England and English Heritage, 2005 (www.english-heritage.org.uk/upload/pdf/16602_HumanRemains1.pdf)

"Church Archaeology: its care and management", Council for the Care of Churches, 1999

The Advisory Panel on the Archaeology of Christian burials in England can provide free well-informed advice with consideration of relevant religious, ethical, legal, archaeological and scientific issues. Panel's website:

http://www.britarch.ac.uk/churches/humanremains/index.html

or email the secretary simon.mays@english-heritage.org.uk

4 Treasure

Defined as:

• Any metallic object, other than a coin, provided that at least 10% by weight of metal is precious metal and that is at least 300 years old when found

• Any group of two or more metallic objects of any composition of prehistoric date that come from the same find

• All coins from the same find provided that they are at least 300 years old when found, but if the coins contain less than 10% gold or silver there must be at least ten

• Any object, whatever it is made of, that is found in the same place as, or had previously been together with, another object that is Treasure

• Any object that would previously have been treasure trove, but does not fall within the specific categories given above. Only objects that are less than 300 years old, that are made substantially of gold or silver, that have been deliberately hidden with the intention of recovery and whose owners or heirs are unknown will come into this category

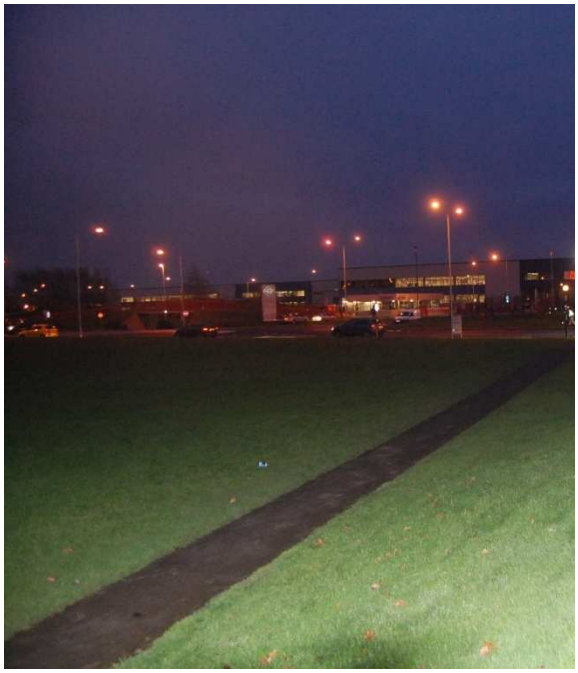
If anything is found which could be Treasure, under the Treasure Act 1996, it is a legal requirement to report it to the local coroner within 14 days of discovery. The Archaeological Contractor must comply with the procedures set out in The Treasure Act 1996. Any treasure must be reported to the coroner and to The Portable Antiquities Scheme Finds Liaison Officer, Rob Collins (0191 2225076 or Robert.Collins@newcastle.ac.uk) who can provide guidance on the Treasure Act procedures.

If you need this information in another format or language, please contact

Jennifer Morrison, Archaeology Officer.

APPENDIX 3: FIGURES

ACCESS ROAD TO A1290, NISSAN WORKS, WASHINGTON ROAD, USWORTH, TYNE AND WEAR



PRELIMINARY EVALUATION REPORT

CP. NO: 1016/09

16/12/2009

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DOCUMENT TITLE:	Land off Access Road to A1290, Nissan Works, Washington Road, Usworth
DOCUMENT TYPE:	Preliminary Evaluation Report
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Quality Assurance

This report covers works as outlined in the brief for the above-named project as issued by the relevant authority, and as outlined in the agreed programme of works. Any deviation to the programme of works has been agreed by all parties. The works have been carried out according to the guidelines set out in the Institute for Archaeologists (IfA) Standards, Policy Statements and Codes of Conduct. The report has been prepared in keeping with the guidance set out by North Pennines Archaeology Ltd on the preparation of reports.

REVISION SCHEDULE			
	01	**02**	**03**
PREPARED BY: **POSITION:** **DATE:**	Tony Liddell Supervisor 16/12/2009		
EDITED BY: **POSITION:** **DATE:**	Martin Railton Project Manager 16/12/2009		
APPROVED BY: **POSITION:** **DATE:**	Frank Giecco Principal Archaeologist 16/12/2009		

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SUMMARY

In December 2009, North Pennines Archaeology Limited undertook an archaeological evaluation on land off the A1290 by the Nissan Works at Washington, Sunderland, Tyne and Wear (NGR: NZ 340 588). This was at the request of MDA Developments Ltd, and was in advance of the submission of a planning application for a sustainable manufacturing centre by Gateshead College (Planning Application 09/02486/FUL).

The town of Washington is situated approximately 9km to the west of Sunderland, on the north side of the River Wear. The Nissan factory is located between Sunderland and Washington, on the west side of the A19 and to the north of the A1231, and the development site is directly north of the factory. The development site lies within an area formerly occupied by an airfield constructed in 1916. Hylton or West Moor Airfield was a Flight Station for 'B' Flight of 36 Squadron. In 1917, the airfield was renamed 'Usworth' and was used by 'A' Flight. Previous archaeological research into the site revealed that there were still buildings associated with this early airfield in 1934, with further buildings present throughout the Second World War and into the 1950s. In accordance with PPG16 and UDP Policy B14 a programme of archaeological evaluation was required to ascertain if any trace of these buildings survive.

The field evaluation consisted of four trial trenches, located to target specific remains of buildings from the First World War airfield: the Main Stores, Motor Transport Sheds and Office and the Workshops.

The trenching revealed a relatively uniform stratigraphy, with natural clay underlying all trenches at an average height of 32.83mOD. All trenches contained a modern 20th century deposit overlying the natural substrate, the top of which averaged a datum height of 33.14m. This deposit indicates the level taken during the clearance of the site with any remains of the airfield buildings removed to this depth or below. This deposit also represents the depth of overburden stripped to during the building of the Nissan Works, when the development site was used as a storage and work area: this is demonstrated by the modern crushed hardcore observed in both Trenches C and D. Trench C also showed the use of hardcore to create the landscaped bunds in the northern extent of the site, indicating that the bunds are simply landscape features rather than the remains of earlier airfield buildings.

In Trench A, a concrete drain was uncovered in the northeast corner of the trench set within the modern backfill. While this could be a remnant of the drainage system from the airfield, it is more likely to be part of a drainage system set up while the area was used as a working compound for the construction of the Nissan Works. Trench B revealed a highly truncated concrete wall footing, which bears no relation to the potential remains of the Main Stores which the trench was targeting. However, the alignment does match with the edge of the road to the east of the building, perhaps indicating that the lowest remains of the road edging still remain *in-situ*.

Overall, the trenching revealed that no remnants of the buildings targeted remain in the evaluation area, with concrete footing remains minimal at best, with the majority removed during the 1980s when the area was used as a compound during the construction of the Nissan Works to the south.

The North-East Regional Research Framework 'Shared Visions' notes that there are relatively few World War I remains in the north-east.. The Research Agenda and Strategy in this publication notes that 'remains relating to the First World War must be recorded, and that full recording is necessary of all 20th century military and defence remains where they are affected by development work'. While it is clear from the previous deskbased assessment that the development area was in use during the First and Second World Wars, the remains of the buildings from that period have been destroyed and removed during the 1980s.

ACKNOWLEDGEMENTS

North Pennines Archaeology Ltd would like to thank MDA Development Ltd for commissioning the project.

NPA Ltd would also like to thank Jennifer Morrison, Archaeology Officer for Newcastle City Council, for all her help and assistance throughout the project.

The archaeological evaluation was undertaken by Tony Liddell and Michael McElligott, with the help of machine-driver John Thralkeld. The trenches were surveyed by Matthew Town and Helen Noakes. The report was written and the drawings produced by Tony Liddell. The project was managed by Frank Giecco, Technical Director for NPA Ltd. The report was edited by Martin Railton, Project Manager for NPA Ltd.

1 INTRODUCTION

1.1 CIRCUMSTANCES OF THE PROJECT

1.1.1 In December 2009, North Pennines Archaeology Limited undertook an archaeological evaluation on land off the A1290 by the Nissan Works at Washington, Sunderland, Tyne and Wear College ([NGR: NZ 340 588]; Figure 1). This was at the request of MDA Developments Ltd, and was in advance of the submission of a planning application for a sustainable manufacturing centre by Gateshead.

1.1.2 The town of Washington is situated approximately 9km to the west of Sunderland, on the north side of the River Wear. The Nissan factory is located between Sunderland and Washington, on the west side of the A19 and to the north of the A1231, and the development site is directly north of the factory.

1.1.3 The development site lies within an area formerly occupied by an airfield constructed in 1916. Hylton or West Moor Airfield was a Flight Station for 'B' Flight of 36 Squadron. In 1917, the airfield was renamed 'Usworth' and was used by 'A' Flight. Previous archaeological research into the site revealed that there were still buildings associated with this early airfield in 1934, with further buildings present throughout the Second World War and into the 1950s (Wooler 2009). In accordance with PPG16 and UDP Policy B14 a programme of archaeological evaluation was required to ascertain if any trace of these buildings survive.

1.1.4 This report sets out the results of the work in the form of a short document outlining the findings, followed by a statement of the archaeological potential of the area, an assessment of the impact of the proposed development, and recommendations for further work.

2 METHODOLOGY

2.1 ARCHAEOLOGICAL BRIEF

2.1.1 A *Specification for Preliminary Archaeological Evaluation at Land off access road to A1290, Nissan, Washington Road, Usworth* (Morrison 2009) was produced by Newcastle City Council and a subsequent trench location plan submitted by North Pennines Archaeology Limited on behalf of the client, MDA Developments Limited, for an archaeological evaluation of the development area. The specification and trench location was agreed upon in consultation with the Archaeology Officer for Newcastle City Council.

2.1.2 Following acceptance of the trench location plan by Newcastle City Council, North Pennines Archaeology Ltd was commissioned by MDA Developments Ltd to undertake the work. The specification and trench location plan was adhered to in full, and the work was consistent with the relevant standards and procedures of the Institute for Archaeologists (IfA), and generally accepted best practice.

2.2 ARCHAEOLOGICAL EVALUATION

2.2.1 The field evaluation consisted of four trial trenches, with Trench A measuring 10.0m in length by 1.60m in width, and Trenches B-D 5.0m in length by 3.0m in width. The trenches were located to target specific remains of buildings from the Second World War airfield: the Main Stores, Motor Transport Sheds and Office and the Workshops.

2.2.2 The location and size of the trial trenches were agreed by consultation between North Pennines Archaeology Ltd and Jennifer Morrison, Archaeology Officer for Newcastle City Council.

2.2.3 The aims of the evaluation can be summarised as follows:

- to establish the presence/absence, nature, extent and state of preservation of archaeological remains and to record these where they are observed;
- to establish the character of those features in terms of cuts, soil matrices and interfaces;
- to recover artefactual material, especially that useful for dating purposes;
- to recover palaeoenvironmental material where it survives in order to understand site and landscape formation processes.

2.3 METHODOLOGY

2.3.1 The trenches were located using Trimble Zeiss 3601 Total Station survey using coordinates from the trench location plan.

2.3.2 The trenches were excavated by a mechanical excavator equipped with a toothless 1.6m wide ditching bucket, under archaeological supervision, to the top of the natural substrate. Each trench was then manually cleaned and any putative archaeological features investigated and recorded according to the North Pennines Archaeology Ltd standard procedure as set out in the NPA Excavation Manual (Giecco 2003).

2.3.3 A photographic record was made using digital photography, 400 ISO Black and White print and 200 ISO Colour Slide film.

2.3.4 All work was undertaken in accordance with the Institute for Archaeologists Standards and Guidance for Archaeological Field Evaluations (IfA 2008).

2.4 THE ARCHIVE

2.4.1 A full professional archive has been compiled in accordance with the specification, and in line with current UKIC (1990) and English Heritage Guidelines (1991) and according to the Archaeological Archives Forum recommendations (Brown 2007). The archive, including the physical and paper archive and copies of the report, will be sent to Tullie House, Carlisle, and will be made available upon request. The archive can be accessed under the unique project identifier NPA09, GCN-A, CP 1016/09.

2.4.2 North Pennines Archaeology supports the **O**nline **A**cces**S** to the **I**ndex of Archaeological Investigation**S** (**OASIS**) project. This project aims to provide an on-line index and access to the extensive and expanding body of grey literature, created as a result of developer-funded archaeological work. As a result, details of the results of this project will be made available by North Pennines Archaeology, and can be accessed under the unique identification number *northpen3- 69355*.

3 BACKGROUND

3.1 LOCATION AND GEOLOGICAL CONTEXT

3.1.1 The city of Sunderland is located in the north-east of England, approximately 16km to the south-east of Newcastle upon Tyne and c.14km to the north-east of Durham. The town of Washington is situated approximately 9km to the west of Sunderland, on the north side of the River Wear. The Nissan factory is located between Sunderland and Washington, on the west side of the A19 and to the north of the A1231.

3.1.2 The topography of the area in and around Sunderland is determined by the geological structure. The strata found in the area are carboniferous coal measures and deposited Permian limestone overlay by glacial drift and alluvium. This limestone overlay rises in a more or less gentle slope under its blanket of glacial drift from the coast to a western escarpment about 500ft above sea level (Countryside Commission 1998).

3.2 HISTORICAL CONTEXT

3.2.1 *Introduction:* this historical background is compiled from the Desk Based Assessment (Wooler 2009) and is intended only as a summary of historical developments specific to the study area.

3.2.2 The place name Usworth is thought to stem from the Old English "burn by Osa's road".

3.2.3 ***Prehistoric Period (pre c.AD 43)***: no prehistoric activity located close to the proposed development area was noted in material consulted for the Desk Based Assessment. The Archaeological Data Service, however, contains an entry in its online catalogue for a possible prehistoric or Roman rectilinear site within an oval enclosure at grid reference NZ 333 90, to the north-west of Usworth airfield, between the Three Horse Shoes and North Moor Farm.

3.2.4 In the nearby vicinity, evidence for human settlement and activity in the Hylton area comes largely from findspots. In 1885 a dug-out canoe was found in the bed of the River Wear at Hylton. A second similar canoe was already known to Sunderland Museum as they had in their collection a photograph showing a fragmentary example. This canoe was believed to have been dredged from the River Wear between Hylton Dene and Southwick. The two canoes are suggested to have dated to the late Bronze Age or the Iron Age. Other prehistoric finds within the locality of Hylton include a bronze socketed axe from the Wear and two late Bronze Age swords from the Wear at Ford. The axe and two swords (which are of the Park Ewart type) are considered to be c.900-700BC.

3.2.5 In the wider landscape, prehistoric activity is evidenced by Bronze Age burials at Humbleton Hill and Hastings Hill, and Mesolithic and Neolithic flints and arrowheads have been found at Grindon, all on the south side the River Wear. Mesolithic to late Bronze/early Iron Age occupation have been discovered at Bishopwearmouth, also on the south side of the Wear, and prehistoric burials and enclosures are known at Fulwell and Carley Hill on the north side of the river, and to the east of Hylton.

3.2.6 ***Romano-British Period (c.AD 43-400)***: in 1939, a hoard of Roman coins were found at Washington Station. The hoard contained 59 coins including one minted during the reign of Emperor Constantine (possibly 4th century AD). There is no evidence as yet for activity during this period in close proximity to the proposed development area although the cropmarks already referred to may date to this period. It has been mentioned by Mr Fulton at the North East Aircraft Museum, that 'Roman remains' were found during preparatory work for the construction of the Nissan plant on the former airfield. No written confirmation of this has, however, been found during the desk-based assessment.

3.2.7 The main evidence for occupation of the area around Sunderland during this period is in the form of burials and coins. In 1759 a cist containing a large skeleton was uncovered at Fulwell during limestone quarrying. Two coins dating from the beginning of the 3rd century were found close by. To the north, near the Carley Hill quarry, a bronze figurine of Jupiter Dolichenus, a Romano-British god, was discovered in 1820. In 1971 the hill also yielded two Roman coins dating from the 2nd to the 3rd centuries. To the west at Southwick quarry, pieces of Roman pottery, including the remains of a late 4th century cooling pot were found in 1927. Coins from the period have also been found at and around Hylton, as well as a possible Roman milestone inscribed with a dedication to the Emperor Gordian (AD 238-44) found in the Wear and recorded by the prominent antiquarian, Robert Surtees, although its exact find spot is unknown.

3.2.8 ***Early Medieval Period (c.AD 400-1066)***: the only evidence for activity or settlement during this period comes from place names, as already referred to in 3.2.2 above. What is now known as Tyne and Wear was certainly an important area during this period as show by early Christian sites such as Jarrow (HER 1227), Tynemouth (HER 124-9) and Monkwearmouth which was founded by Bishop Bishop in 674AD (HER 87). There is no evidence of activity during this period in close proximity to the proposed development area, although as with earlier periods this does not mean a total absence of settlement or land use.

3.2.9 ***Medieval Period (c.AD 1066-1485)***: there is no evidence of medieval activity in the vicinity of the proposed development area. It is possible that the land may have been on the edges of Hylton Castle estate, and may have been waste, common or agricultural in nature.

3.2.10 Hylton Castle, located to the east of the proposed development area and now surrounded by housing, was built by Sir William Hylton as a gatehouse style fortified manor house. Although no construction records survive, the style of the architecture and coats of arms on the west front mean that it dates to the 1390s or the first decade of the 1400s. Other buildings may have existed on the site at this time, as the inventory taken on Sir William's death in 1435 mentions a hall, four chambers, two barns, a kitchen and the chapel in addition to the castle. Early in the 18th century, Baron John Hylton made the first major alterations. He completely redesigned the interior and inserted large windows in the fashionable Italianate style. His son, John, made even greater alterations. He built a south wing and added crenallations to both wings. When he died in 1746, the Hyltons sold the castle, as there was no male heir to inherit it. Successive owners failed to maintain it, and in 1863 it was bought by William Briggs, who knocked down the north and south wings, gutted the interior and added new windows. The chapel at Hylton Castle, dedicated to St Catherine, is known to have existed on the site since 1157, when it was likely that Hylton Castle was a wooden building. Nothing remains of the first chapel and the ruins seen today date from the early 15th century.

3.2.11 Like the rest of Monkwearmouth parish, Hylton had presumably been part of the lands of the Anglian monastery, but after the Norman Conquest it did not pass with the other townships to the priory's monastic cell. From the 12th century, and perhaps earlier, the manor and township of Hylton belonged to the Hilton family who took their name from the estate. There is evidence that there was a mill at Hylton by the late 12th century, although its precise location if unknown. If it was a watermill if may have stood at Hylton Dene. In later centuries a windmill was sited to the north of the castle.

3.2.12 ***Post-Medieval Period (c.AD 1485-1900)***: writing in 1967, Bennett refers to the 'Blackwood' located beside Usworth Aerodrome, as providing some idea of what the countryside was like in the area before any clearance was undertaken, although the exact location of the 'Blackwood' does not appear to be shown on any historical mapping. He noted that the land between Biddick Forest and the Three Horse Shoes was drained in 1820. Oak was mainly grown in Biddick Forest, and for centuries it was exported from Sunderland port, providing a considerable trade in hardwood as well as coal.

3.2.13 Nearby Hylton Castle was the site of skirmishes during the Civil War in the middle of the 17th century. Corfe noted that these skirmishes took place on high ground to the north of the castle in 1644.

3.2.14 Industries along the Wear appear to have been well established by the early 19th century. Parson and White refer to industry at Southwick (1¼ miles north-west of Sunderland and to the east of Hylton) on the north bank of the river, which included several shipyards, lime-kilns and earthenware and glass manufactories. The trade directory in Parson and White lists the trades in the township of Hylton in 1828, these appear to be more agricultural in nature rather than industrial, apart from Auston Dixon & Co, earthenware manufacturers at Hylton Ferry and Robert Reay, shipbuilder and timber merchant at the same location. Farms such as Cow Stand (occupied by Marmaduke Robinson), West Moor (Thomas Reed) and South Moor (George and James Curry), all previously located within close proximity to the proposed development area, were all in existence at this date. The Three Horse Shoes is listed as occupied by John Merriman, victualler and blacksmith, at 'Road Stone' in Hylton township; this may be an earlier name for the site although it is not shown on later mapping. North Hylton appears to have been more industrial than the rest of the township, no doubt due to its proximity to the river. Brett refers to industries such as iron ore (on land close to the ship building yards); charcoal; lamp black; grindstones and whetstones (North Hylton had quarries that yielded grindstones in the 17th and 18th centuries) which were exported all around the world; sandstone quarried from sites such as Wood House at North Hylton; tar; a pottery had been established at North Hylton in 1762 by the Maling family. The Malings had been Huguenot refugees who settle in Scarborough before moving to Sunderland. Rich clay beds and the riverside location for east of transport on the Wood House estate made it an ideal site for a pottery. The outbreak of the Crimean War in 1854 signaled an upturn in industry in North Hylton. The old pottery building was turned into a forge and iron works and shipbuilding yards sprang up on vacant lots on the riverside.

3.2.15 With reference to Hylton Colliery (or Castletown Colliery), Brett noted that the Wearmouth Coal Company bought the Wear Steel Works, 36 acres of land and 190 workmen's cottage for £37 000. The company began work on sinking the first shaft in March 1897. In October 1900 the mine was still being developed but was still producing 500 tons of coal a day. Output almost doubled when Hylton was at its peak and the workforce topped the 1000 mark. In 1907 the coal company bought the whole of the 2000 acres Hylton Castle Estate including the castle. As they already owned the coal rights the purchase was made as an investment. In the late 1970s Hylton was one of a number of small Durham collieries which ceased mining coal, the

pit finally closed in July 1979. The colliery at Hylton (located approximately 2km to the south-east of the proposed development area) was not the only colliery site in the area; Usworth Colliery is shown on the Ordnance Survey map of 1921 (HER No. 365) and a colliery also existed at Boldon to the north which opened in 1862 and closed in 1982 (HER No. 2567). There does not appear to have been any collieries within close proximity to the proposed development area.

3.2.16 The mining of coal was greatly aided by the railways. The colliery at Usworth (NZ 315 584) was served by sidings alongside what became the North Eastern Railway line from Washington to Pelaw, ½ mile north of Usworth Station. Prior to the first locomotives, trucks on these sidings were almost certainly shunted by horses33. The Pontop and South Shields Branch of the North Eastern Railway was originally the Stanhope and Tyne Railway which opened in 1834 as the first public railway on Tyneside. It carried minerals from County Durham to the Tyne and passengers from South Shields to the Durham Turnpike (HER No. 2290). The Hylton, Southwick and Monkwearmouth Railway was formed in 1871 to develop industry on the north bank of the Tyne. It opened in 1876 between the NER line at Monkwearmouth and the NER's Tyne Dock-Consett line at Southwick Junction, although the latter connection was removed shortly after. Both the Pontop and South Shields Branch of the NER and the Hylton, Southwick and Monkwearmouth branch line are located to the west and the south of the proposed development site respectively. There was no evidence that any railway lines or associated features crossed the proposed development area.

3.2.17 ***Modern (1900-Present)***: the industrial nature of the area around Sunderland, such as shipbuilding and coal mining, meant that the town and its hinterland were obvious German targets during the First World War. In April 1916, for example, a Zeppelin passed over Seaham harbour and crossed over the colliery villages towards Washington. Fourteen explosive bombs and seven incendiary bombs were dropped within five minutes. The first bomb in Sunderland landed in a yard in Peacock Street. The Zeppelin then made its way towards Monkwearmouth goods yard, hitting North Bridge Street, the tramway sheds and the Workmen's Hall (Calvert Street). The greatest amount of damage was done to Fern Street, North Bridge Street and Victor Street.

3.2.18 As a consequence of Zeppelin raids on the area around Sunderland, an airfield was created outside the town in October 1916 as a Station for 'B' Flight of No. 36 Squadron. It was originally known as Hylton, although when it was being prepared it was known as West Town Moor. Due to the increase in German bombing, the Royal Flying Corps undertook the task of Home Defence, setting up a number of squadrons, with flights spread over

the length of the British coastline. The north-east was protected by No. 36 Home Defence Squadron, which was formed by Capt. R O Abercromby at Cramlington in February 1916. No. 36 Home Defence Squadron defended the coast between Whitby and Newcastle. The main base was at Cramlington, to the north of Newcastle, with flights being attached to Seaton Carew and Ashington, as well as Hylton. By August 1918 Hylton was in use by 'A' Flight and continued as such until the Armistice, when it was just beginning to become known as Usworth.

3.2.19 Following the end of the First World War, Usworth airfield reverted to non-flying use, as was the case with many First World War aerodromes. Usworth languished unused for over a decade, apart from at least one visit by Alan Cobham's Flying Circus, until it was re-activated on March 17th 1930. From this period, the flying field was located to the south side of the road between Washington and Sunderland, and ancillary buildings were located to the north. The airfield was designed to accommodate one squadron of the recently expanded Royal Auxiliary Air Force, No. 607 (County of Durham) Squadron. North Camp was provided with living quarters and dining facilities for Officers, NCOs and airmen. It was initially proposed to erect canvas Besoneaux Hangars on the South Camp, however these were rejected in favour of the erection of a large Lamella Hangar. The South Camp also housed the Squadron Office, pilot huts, armoury, photographic hut and bombing training aids. The firing butts were alongside the railway. On 24th 1934, the airfield was opened to the public on Empire Air Day; this attracted 1300 visitors with an estimated 5000 other spectators watching the flying displays form outside the airfield. Proceeds from the Empire Air Day went to the RAF Benevolent Fund. The Empire Air Day in 1937, as well as having flying demonstrations and aerobatics, also included the erection of a dummy fort near the southern perimeter of the airfield, which was the subject of 'attacks' by the Hinds of 103 Squadron with the Demons of No. 607 Squadron 'defending'.

3.2.20 In September 1939 work commenced on the laying of two concrete runways, as well as the expansion of the airfield to the south, east and west by taking in adjoining fields. The new 2800 feet (c.900m) long runway was laid northwest to south-east, with another of similar length on a north-south heading. A new perimeter track was laid out along the airfield boundary with eight dispersal pens, each capable of holding a twin-engined aircraft. There were also 34 hard standings for single-engined fighters. Three of the older Callender Hangers were dismantled, leaving the Lamella and a single Callender hangar opposite the main gate. Additional buildings were constructed between the airfield and the road. An Operations Room was built near the Lamella hangar; this was later supplemented by an

underground Battle Headquarters near the Cow Stand Farm corner of the airfield. On the North Camp side new accommodation blocks were erected for the expected large influx of personnel which included WAAFs. On both sides of the road numerous air raid shelters were constructed. To assist in the defence of the airfield a series of dispersed sites were set up over a wide area around the site; these included a searchlight camp at the top of Ferryboat Lane and small gunposts on the Birtley Road, above the old quarries at the bottom end of Boldon Bank and along the disused railway line towards North Hylton. At Downhill Farm a large gun site was set up, and a decontamination centre was constructed well away from the airfield. During the Second World War, a watch tower was constructed on stilts on the roof of the Three Horse Shoes; the pub also acted as a Mess for Officers during this period.

3.2.21 In the publication *Archaeology of the Twentieth Century Defence Sites of Tyne and Wear: An Illustrated Guide*, several sites in and around the airfield at Usworth are listed. Of particular interest are the Pickett-Hamilton Forts, which were a form of pillbox unique to airfields, and which were often placed down the very centre of the runway. Pickett-Hamilton Forts were sunken, circular reinforced concrete pillboxes which remained flush with the airfields surface to permit the free movement of aircraft. If there was a threat of attack, however, the forts would be raised by a hand operated hydraulic jack and manned with guns.

3.2.22 Sunderland and its surrounding area did not escape bombing during the Second World War. The first bombs dropped on the district fell soon after midnight on the 22nd June 1940. Areas affected included buildings at the Old Rectory at Whitburn, a field near Church Lane and The Bents, and the Fishermen's Cottages, which narrowly escaped being demolished. An incendiary bomb fell onto Hylton Dene, 100 yards from Hylton Colliery, Castletown.

3.2.23 The airfield at Usworth had the distinction of being singled out for a major Luftwaffe attack during the Battle of Britain. On August 15th 1940, German aircraft were detected approaching the east coast of Britain. Spitfires from 72 Squadron Ackington met them off the Farne Islands, and although heavily outnumbered, several German aircraft were destroyed. The German formation then split in two, one portion making for Tyneside, while the other turned south. The Second Acklington Squadron, No. 79, encountered the northern group just off the coast and a wild dog-fight ensued. Reforming, the Hurricanes caught up with the bombers approaching Newcastle, where their primary objective would appear to have been Usworth. Harried by the Tyne guns and by more Hurricanes from Drem in

Scotland, the German 'Heinkels' made off, scattering their bombs with little effect, and leaving Usworth untouched.

3.2.24 For much of the Second World War, Usworth was used for training, with pilots of several nations stationed there, including Polish, Czech, Canadian, Australians, Americans and New Zealanders. The training of new pilots up to operational status was a hazardous activity with many aircraft damaged or destroyed during this period. Many of these pilots have their last resting place in Castletown cemetery near the airfield.

3.2.26 Following the end of the Second World War, Usworth was home to No. 31 Gliding School which had formed around 1944. The role of the Gliding School was to provide elementary flying training to cadets of the Air Training Corps from local squadrons in the north-east. In 1951 control of Usworth passed to No. 2 Basic Air Navigation School which disbanded in 1953 when control passed to Durham University Air Squadron. In 1958 the Gliding School, the University Air Squadron and the G.C.I aircraft were moved to RAF Ouston as Usworth was to close, although some limited use of the site was made by the Territorial Army for parachute training from tethered balloons. On 3rd July 1962, Usworth was bought by Sunderland Corporation for £27, 000 and reopened as Sunderland Airport.

3.2.27 Sunderland Corporation re-laid the runways and renovated the hangar, and in June 1963 Sunderland Flying Club came into being. On June 28th 1964 an Open Day and commemorative ceremony took place to celebrate the rebirth of what became Sunderland Airport. The Air Day in 1964 became an annual event with subsequent shows attracting greater participation. Sunderland Air Day in June 1981 attracted an estimated 50, 000 people to the airfield and surrounding hills. In the 1980s, 700 people a year made their first parachute jump at Sunderland Airport.

3.2.28 During the 1970s and 1980s, the collapse of manufacturing in the Sunderland area had a detrimental effect on employment. For example, over 34 000 jobs were lost between 1971 and 1981 alone. In the 1980s the economic outlook was bleak, although Sunderland enjoyed Development Area status and was eligible for maximum Urban Aid and EEC grants. The co-ordinated efforts of Sunderland Borough, Tyne and Wear Council, Washington Development Corporation and the government scored a major success in 1984 when they succeeded in attracting Nissan to build its new UK factory on Wearside. The massive Nissan plant was constructed on the 297 acre site of Sunderland (Usworth) Airport.

3.3 PREVIOUS WORK

3.3.1 In 2005, Archaeological Services University of Durham (ASUD) undertook an archaeological desk-based assessment and archaeological monitoring at Nissan Wind Farm (NZ 339 579, to the south of the Nissan factory). The desk-based assessment noted that although there was no direct evidence for prehistoric or Roman activity in the development area the presence of activity in the surrounding vicinity indicated that an as yet unidentified resource has the potential to exist. It was also noted that the use of the site as an airfield in the First and Second World Wars suggested that the site may have undergone significant landscaping to provide a level area for aircraft to land and take off.

3.3.2 An archaeological desk-based assessment was undertaken by On Site Archaeology Ltd (OSA) of land at Nissan Factory Business Park (located between the Nissan factory and the A1231 to the south), Washington, in July 2007 . The work concluded that there was the possibility that buried remains were present on the site, which could date from any period between the early Bronze Age and the present day. It was noted that the remains may survive as features cut into the natural subsoil and would possibly be visible immediately below the topsoil and B-horizon. The top of the archaeology was suggested to be located between 0.2m and 0.5m below the present ground surface.

3.3.3 A geophysical survey was undertaken by Met Surveys in April 2008 at Turbine Business Park, on land to the north of the A1231. The survey covered an area of approximately 20 hectares which at the time was rough pasture. The site had been in agricultural use for the past 20 years and although there were no known sites within the area, it was considered that there was the potential for buried archaeological remains to exist. The survey results revealed no features of archaeological significance, although modern services were noted to run across the site as evidence by manholes. The remains of ridge and furrow were detected in some parts of the site indicating the past agricultural use of the land, but their nature (narrow, closely spaced and straight) suggested they were of relatively modern origin.

3.3.4 Following on from the geophysical survey undertaken by Met Surveys, On Site Archaeology (OSA) conducted an archaeological evaluation on the land at Turbine Park in August 2008. Features such as the ridge and furrow and areas of disturbed ground, highlighted by the geophysical results, were targeted with the evaluation trenches. The work concluded that despite sites apparently rural appearance, it was clear that the site had been heavily re-worked during the 20th century. For example, the central, western and

northern parts of the site had been used to dispose unwanted waste material from building, which may have originated from the construction of the airfield, the test track or the nearby road. In all cases the method of dumping was the same; the topsoil was removed, the 'fill' material was dumped and then the topsoil was reinstated. The only feature potentially older than the 20th century was found in Trench 1 and consisted of a shallow linear feature containing small fragments of white-glazed pottery of 19th or 20th century date. Interestingly, the areas of ridge and furrow apparently revealed by the geophysical survey, and tested by Trenches 6, 8, 9 and 10, were not found. In the cases of Trenches 6 and 8 the presence of respectively c.0.70m thick and a 1.5m thick layer of dumped material would have prevented the detection of any preserved ridge and furrow.

3.3.5 In June 2009, North Pennines Archaeology Limited were commissioned by MDA Consulting Ltd to undertake an archaeological desk-based assessment of the current development area prior to the submission of a planning application for a sustainable manufacturing centre by Gateshead College. The desk-based assessment revealed that the proposed development area appears to have been undeveloped until the construction of the airfield at Usworth in 1916. The land appears to have been agricultural in character, despite industrial activity within close proximity (for example, the various railway branch lines, collieries and brick works). The assessment also demonstrated that Usworth Airfield started life in October 1916 as a Flight Station for 'B' Flight of 36 Squadron, and was initially known as Hylton or West Town Moor. By 1917, when it was used by 'A' Flight, it was starting to be known as Usworth. For most of its wartime career Usworth was a training station. Aerial photographs from 1934 show buildings at the airfield were located on the site of the proposed development area, with the main entrance situated in the approximate location of the present footpath. A map of 1945 shows the extent of the buildings on the site at that date; although these were mostly constructed of timber it is likely these structures sat on brick or concrete footings. An aerial photograph dating to 1941/1942 showed two cropmarks located to the west of the proposed development area; it is not known if these relate to the airfield or are totally unrelated, but they may suggest earlier activity in close proximity to the airfield site.

4 EVALUATION RESULTS

4.1 INTRODUCTION

4.1.1 The trenches were excavated down to the natural substrate where possible, followed by further hand excavation of potential archaeological features allowing an examination of any prospective archaeological remains. Trench locations are depicted in Figure 2.

4.1.2 Plans and sections of Trenches A, B and D can be found on Figure 3, and a plan and section of Trench C can be found on Figure 4.

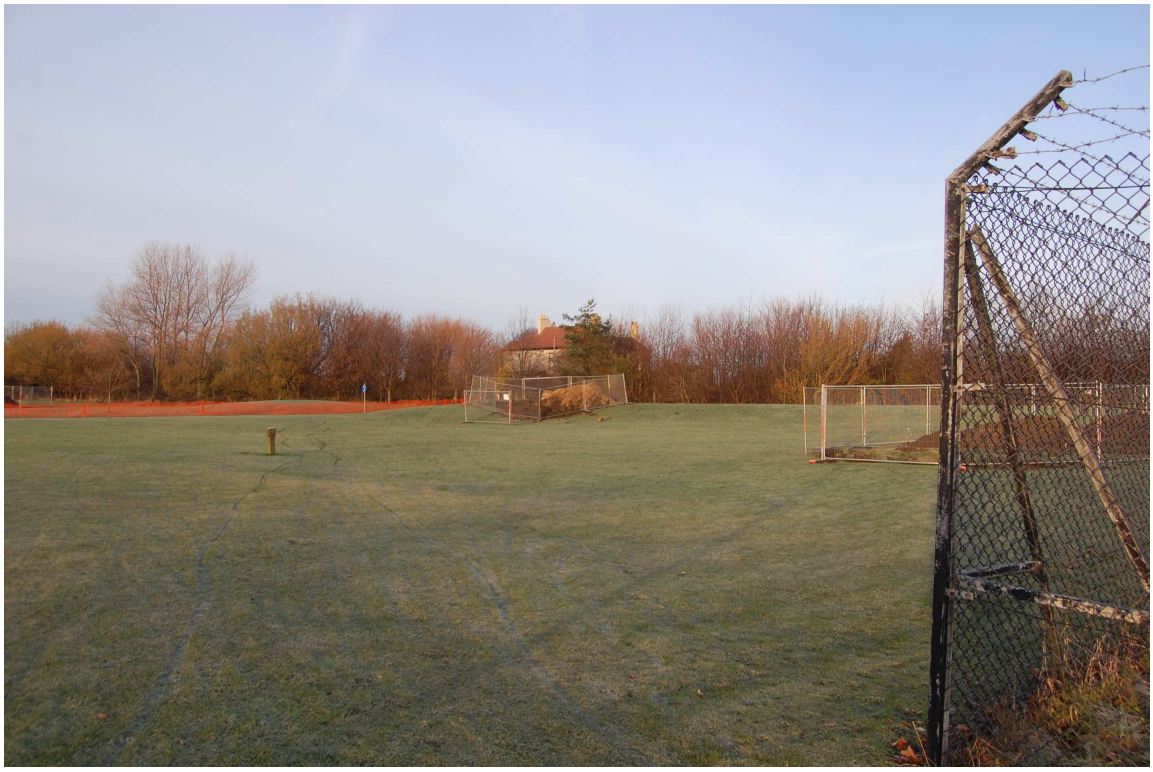

Plate 1. *The site looking northwest.*

4.2 TRENCH A

4.2.1 Trench A measured 10.00m in length and 1.60 in width, and was orientated roughly east-west.

4.2.2 The trench was located to evaluate the potential remains of the western and northern extensions of the Main Stores for the airbase, known to have been of timber construction.

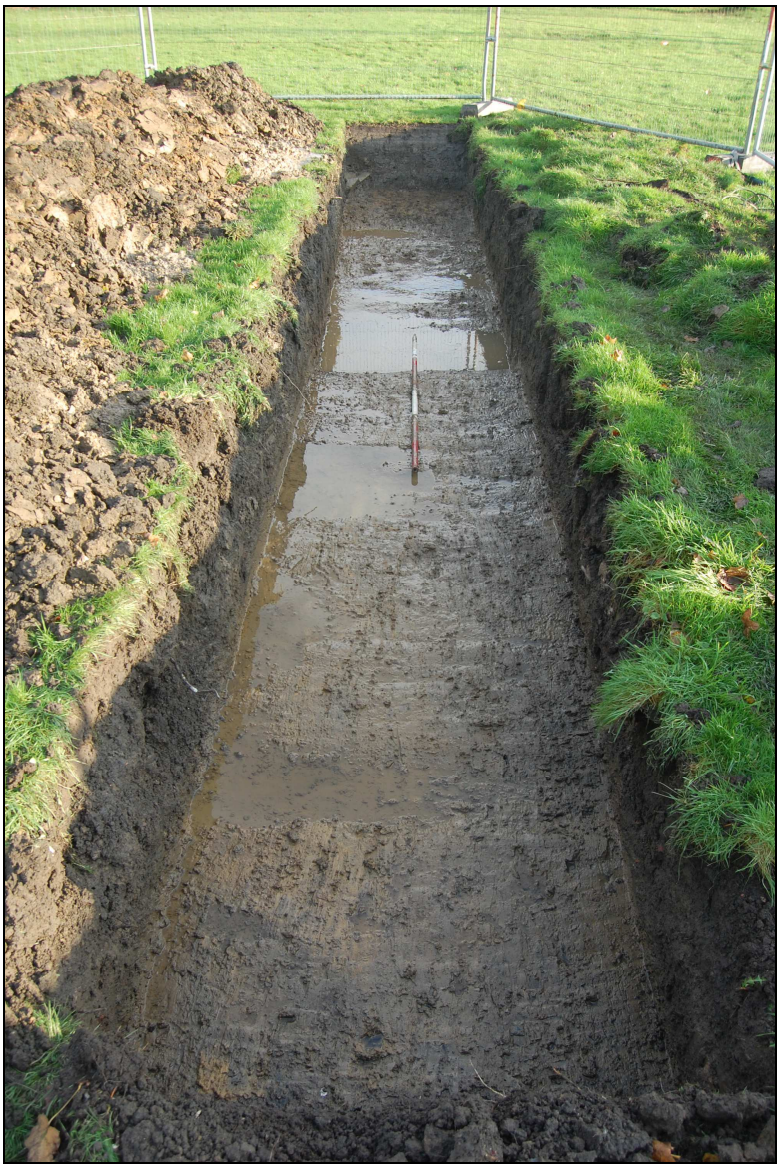

***Plate 2**. Trench A, looking east.*

4.2.3 The natural substrate, context (**102**), was found to be a compact orange/brown sandy clay averaging a depth of 0.68m below the current surface (and at an Ordnance Datum of 32.96m). Above the natural clay was a c.0.35m thick deposit of 20th century backfill, context (**104**), which was a compact mid-grey/brown silty clay with inclusions of small stones, concrete slivers and brick fragments. Above the backfill was a modern subsoil layer, context (**101**), which measured c.0.22m thick and was comprised of loose mid-brown sandy clay. Topsoil and turf, context (**100**), sealed the subsoil with an average depth of 0.14m.

4.2.4 In the north east corner of the trench the edge of a concrete drain, context (**108**), was uncovered aligned northwest-southeast, and sitting within the

modern backfill at 33.12mOD. This suggests that either the drain is not *in-situ*, or that the backfill context was laid at the same time as the drain, possibly as a packing 'foundation' layer for the building.

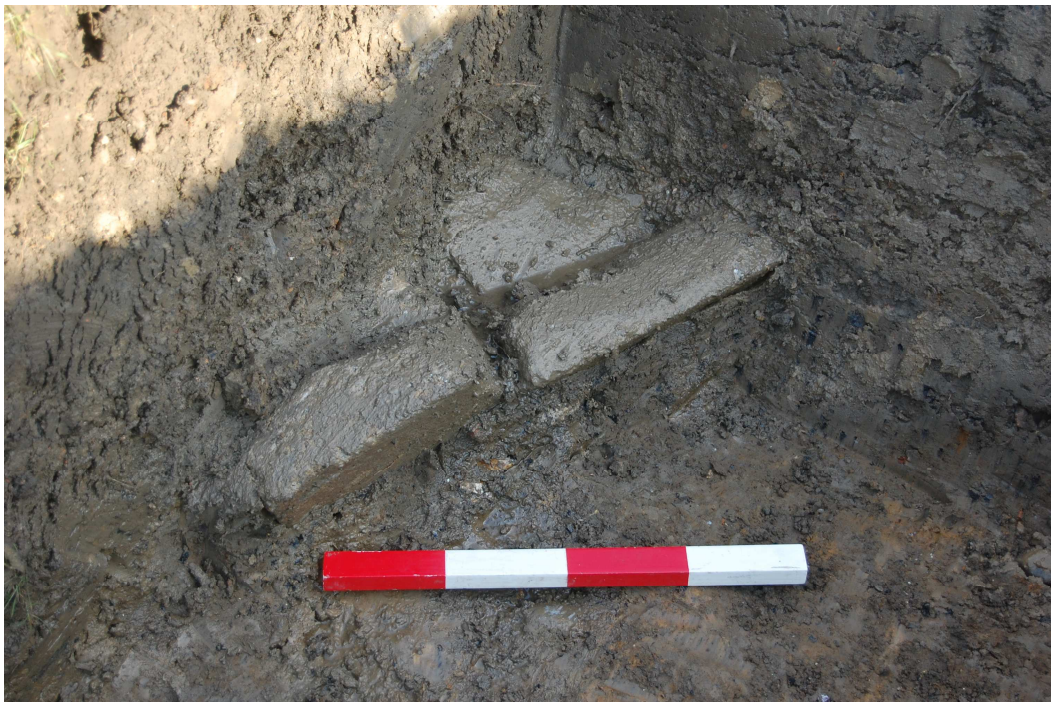

***Plate 3**. Drain (**108**) looking north-east.*

4.2.5 Fragments of late 20th century pottery and glass were recovered from context (**104**), with the other strata remaining artefactually sterile. No deposits were deemed suitable for environmental sampling.

4.3 TRENCH B

4.3.1 Trench B measured 5.0m in length and 3.0m in width, and was orientated roughly east-west .

4.3.2 The trench was located to evaluate the potential remains of the eastern extension of the Main Stores for the airbase, known to have been of timber construction.

4.3.3 The natural substrate, context (**102**), averaged a depth of 0.89m below the current surface (Ordnance Datum of 32.54m). Over the natural clay was a c.0.45m thick deposit of context (**104**), comprising 20th century backfill, above which was the modern subsoil layer, context (**101**), which measured c.0.22m

Topsoil and turf, context (**100**), sealed the subsoil with an average depth of 0.22m.

4.3.4 In the western extent of the trench was the remains of a concrete wall footing (**106**), aligned roughly northwest-southeast (Plate 5). The footing of the wall lay at 32.85m OD, measured 0.47m in width and spanned the width of the trench. The concrete lay on a thin deposit of context (**107**), a black ash and grit deposit which made up the lowest foundation strata of the wall remains.

4.3.5 Fragments of 20th century pottery and glass were recovered from context (**104**), with the other strata remaining sterile of artefacts. No deposits were deemed viable for environmental sampling.

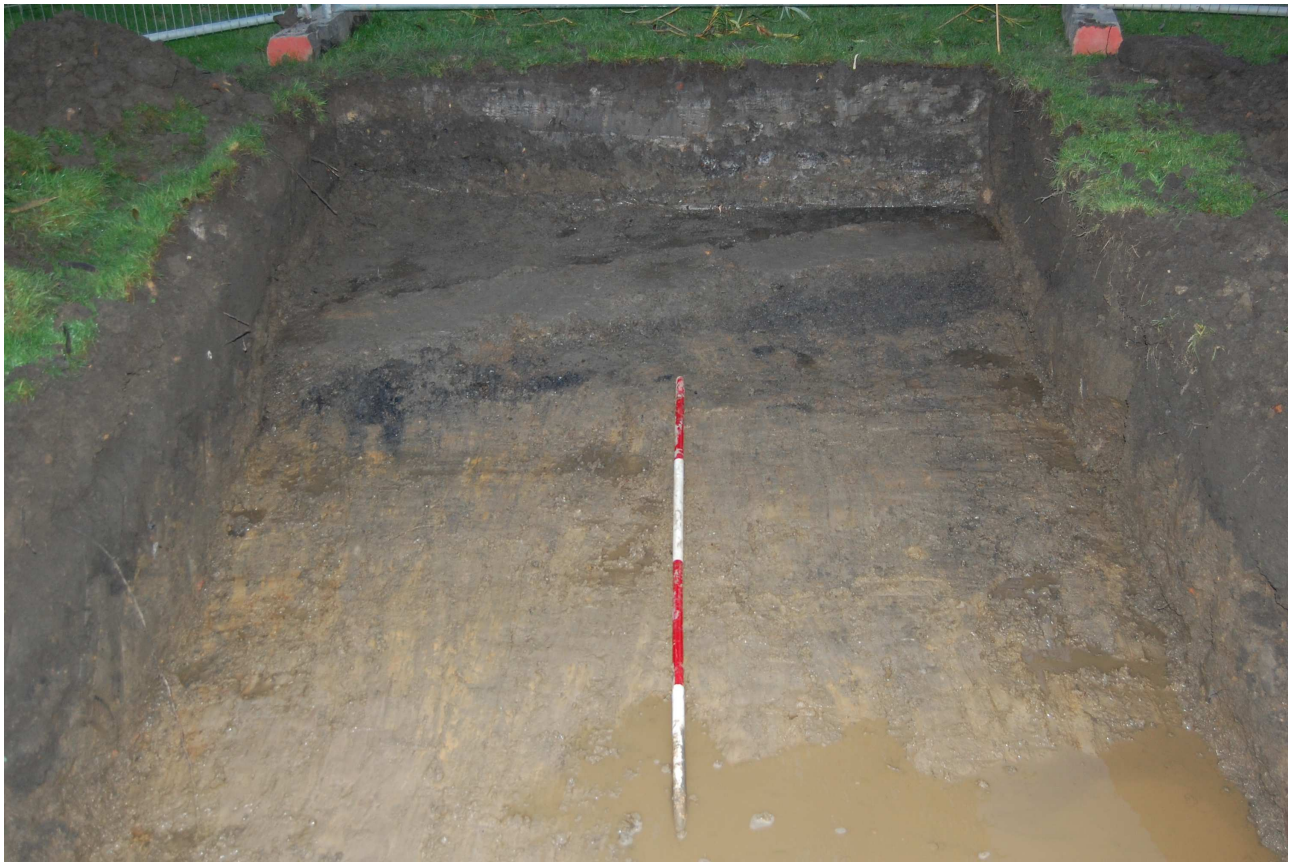

Plate 4. *Trench B, looking west.*

***Plate 5**. Wall footing (106), looking north.*

4.4 TRENCH C

4.4.1 Trench C measured 5.0m in length and 3.0m in width, and was orientated roughly north-south on the crest of a bund bordering the north side of the plot of land to the east of the dividing public path.

4.4.2 The trench was located to evaluate the potential remains of the Motor Transport Sheds and Office for the airbase, known to have been of timber construction.

4.3.3 In this trench, the natural substrate was not revealed due to the trench depth exceeding the reach of the mechanical excavator's bucket due to the trench's position on the bund. The depth excavated reached a vertical 2.02m, with the 20th century backfill layer, context (**104**), revealed 1.70m below the current surface. Over this layer was a 1.06m thick deposit of pale yellow crushed

hardcore, context (**103**), which formed the core of the bund's structure. Above the hardcore was a 0.27m thick deposit of modern subsoil, context (**101**), sealed by a 0.37m deposit of topsoil and turf, context (**100**).

4.3.4 Due to the highly unstable nature of the hardcore, the trench was stepped inwards and the deepest section of the excavation was not entered for recording purposes on Health and Safety grounds.

4.3.5 No artefactual or structural remains were recovered from this trench, and no deposits were deemed suitable for environmental sampling.

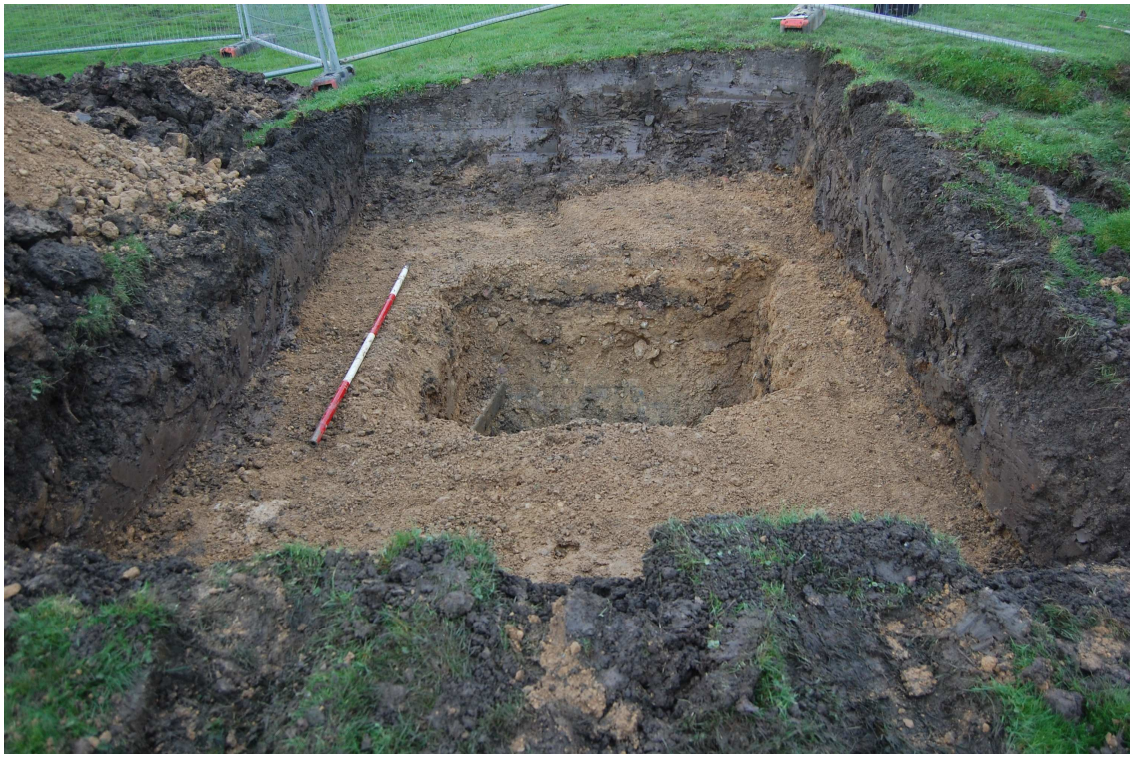

***Plate 6**. Trench C, looking south.*

4.5 TRENCH D

4.5.1 Trench D measured 5.0m in length and 3.0m in width, and was orientated roughly east-west in the eastern extent of the development area.

4.5.2 The trench was located to evaluate the potential remains of the main Workshops for the airbase, known to have been of timber construction.

4.3.3 The natural substrate, context (**102**), was found at a depth of c.0.75m below the current surface (and at an Ordnance Datum of 32.99m). Above the natural clay was a c.0.37m thick deposit of 20th century backfill, context (**104**). Above the backfill was a thin 0.06m thick deposit of pale yellow crushed hardcore, context (**103**), sealed by a c.0.17m thick layer of modern subsoil, context (**101**). As with the previous three trenches, Trench D was

sealed by topsoil and turf, context (**100**), measuring an average thickness of 0.11m.

4.3.4 At the south-western extent of the trench a concrete block, context (**105**), was found embedded in the natural clay. This block measured 0.64m in length, 0.31m in width and had a visible depth of 0.19m. The block was highly degraded, and although it could perhaps have been the remains of a concrete plinth or footing, it is more likely that it is a disturbed block pushed into the natural clay during the leveling of the site.

4.3.5 Fragments of early 20th century pottery were recovered from context (**104**), with the other strata remaining artefactually sterile. No deposits were deemed viable for environmental sampling.

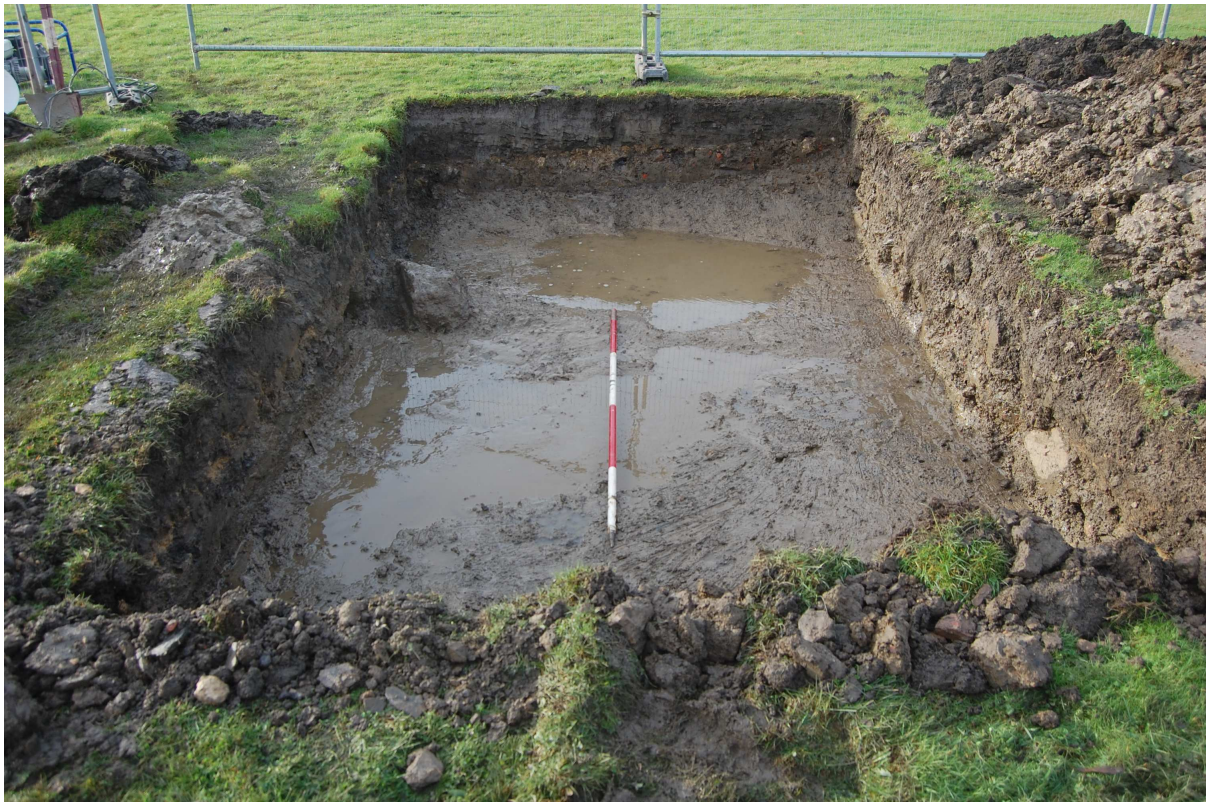

Plate 7. *Trench D, looking west.*

5 CONCLUSIONS AND RECOMMENDATIONS

5.1 CONCLUSIONS

5.1.1 The trenching revealed a relatively uniform stratigraphy, with natural clay underlying all trenches (this is assumed for Trench C) at an average height of 32.83mOD.

5.1.2 All trenches contained a modern 20th century deposit overlying the natural substrate, the top of which averaged a datum height of 33.14mOD. This deposit indicates the level taken during the clearance of the site with any remains of the airfield buildings removed to this depth or below. This deposit also represents the depth of overburden stripped to during the building of the Nissan Works, when the development site was used as a storage and work area: this is demonstrated by the modern crushed hardcore observed in both Trenches C and D. Trench C also showed the use of hardcore to create the landscaped bunds in the northern extent of the site, indicating that the bunds are simply landscape features rather than the remains of airfield buildings.

5.1.3 In Trench A, a concrete drain was uncovered in the northeast corner of the trench set within the modern backfill. While this could be a remnant of the drainage system from the airfield, it is more likely to be part of a drainage system set up while the area was used as a working compound for the construction of the Nissan Works.

5.1.4 Trench B revealed a highly truncated concrete wall footing, which bears no relation to the potential remains of the Main Stores which the trench was targeting. However, the alignment does match with the edge of the road to the east of the building, perhaps indicating that the lowest remains of the road edging still remain *in-situ*.

5.1.5 Overall, the trenching revealed that no timber remains of the buildings targeted remain in the evaluation area, with concrete footing remains minimal at best, with the majority removed during the 1980s when the area was used as a compound during the construction of the Nissan Works to the south.

5.2 RECOMMENDATIONS

5.2.1 The potential for archaeological remains within the development area remains low. Given the lack of any significant archaeological features during the evaluation it is recommended that no further work takes place.

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APPENDIX 1: CONTEXT TABLE

Context	Context Type	Description
(100)	Deposit	Modern topsoil and turf.
(101)	Deposit	Modern subsoil.
(102)	Natural Substrate	Yellow-brown compact sandy clay.
(103)	Deposit	Crushed hardcore in Trenches C and D.
(104)	Deposit	Modern backfill.
(105)	Deposit	Concrete block embedded in natural clay in Trench D.
(106)	Deposit	Concrete wall footing in Trench B.
(107)	Deposit	Packing material for wall footing (106).
(108)	Deposit	Concrete drain in Trench A.

***Table 1**. List of Contexts issued during the Evaluation*

APPENDIX 2: BRIEF

Tyne and Wear Specialist Conservation Team

Specification for Preliminary Archaeological Evaluation at Land off access road to A1290, Nissan, Washington Road, Usworth

Planning Application: 09/02486/FUL

Author:

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West Chapel

Jesmond Old Cemetery

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jennifer.morrison@newcastle.gov.uk

Date: 3 September 2009

County Archaeologist's Reference Number: MON7453

The Tyne and Wear Specialist Conservation Team is the curatorial service for archaeology, industrial archaeology and historic buildings throughout the Tyne and Wear districts. It helps and advises Newcastle, Gateshead, North Tyneside, South Tyneside and Sunderland Councils to carry out their statutory duties to care for the precious historic environment of Tyneside and Wearside. The Team can be found at the Strategic Housing, Planning and Transportation Division of the Environment & Regeneration Directorate of Newcastle City Council.

Introduction

Site grid reference: NZ 340 588

Planning permission has been granted for a two storey office and teaching facility comprising of classrooms, lecture theatre, café, offices and learning resource centre. Attached to this will be a steel portal framed training facility for motor manufacturing and productivity. An

archaeological desk based assessment has been produced (North Pennines Archaeology Ltd, June 2009). The appointed archaeologist must familiarise themselves with the results of this previous archaeological work on the site before starting work.

The report concludes that the site was undeveloped until the construction of the airfield in 1916. Hylton or West Moor Airfield was a Flight Station for 'B' Flight of 36 Squadron. By 1917 it was used by 'A' Flight and was also known as Usworth. There were buildings associated with the airfield within the development site in 1934. They were probably timber buildings on brick or concrete footings. Buildings were present throughout World War Two and into the 1950s. A plan of 1945 identifies some of the buildings within the site as a fire tender garage, MT sheds, station offices and workshops.

The eastern part of the site has been landscaped. The western side is grassed with trees and also landscaped. In accordance with PPG16 and UDP Policy B14 a programme of archaeological evaluation is required to ascertain if any trace of these buildings survives.

Research Aims and Objectives

The evaluation report should make reference to Regional and Thematic Research Frameworks. The North-East Regional Research Framework for the Historic Environment (2006) notes the importance of research as a vital element of development-led archaeological work. It sets out key research priorities for all periods of the past allowing commercial contractors to demonstrate how their fieldwork relates to wider regional and national priorities for the study of archaeology and the historic environment. The aim of NERRF is to ensure that all fieldwork is carried out in a secure research context and that commercial contractors ensure that their investigations ask the right questions.

See http://www.algao.org.uk/Association/England/Regions/ResFwks.htm

Ideally and where possible the evaluation should cross-reference its aims and objectives to national priorities, defined in SHAPE (Strategic Frameworks for Historic Environment Activities and Programmes in English Heritage), and the English Heritage Research Agenda 2005-2010.

Where appropriate note any similar nationwide projects using ADS, internet search engines, ALSF website, HEEP website, OASIS, NMR excavation index. All staff on site must understand the project aims and methodologies.

Methods statement

Four evaluation trenches are needed to inform the Planning Authority of the character, nature, date, depth, degree of survival of archaeological deposits on this site. The excavation must be carried out by a suitably qualified and experienced archaeological organisation. The work will record and environmentally sample any

archaeological deposits of importance found on the plot. The purpose of this brief is to obtain tenders for this work. The report must be the definitive record for deposition in the Tyne and Wear HER, and it must contain recommendations for any further archaeological work needed on this site. The commissioning client needs to be aware that the purpose of the preliminary

evaluation is merely to ascertain if archaeological remains survive on this site and if they do, to determine their broad date, nature and function. Where archaeological remains are found in the preliminary trenches, and if these remains are at threat by the proposed development, further archaeological excavation and or a watching brief will be required before and during development work.

All staff employed by the Archaeological Contractor shall be professional field archaeologists with appropriate skills and experience to undertake work to the highest professional standards. The work will be undertaken according to English Heritage Guidelines – Managing Archaeological Projects 2nd Edition ('MAP2') 1991 (www.englishh.gov.uk/ guidance/ map2/ index.htm) and Management of Research Projects in the Historic Environment (MoRPHE) – The MoRPHE Project Managers' Guide, Project Planning Notes and Technical Guides 2006 (www.englishheritage.org.uk/publications).

The work will be undertaken according to MoRPHE Project Planning Notes 2006 - PPN3 – Archaeological Excavation and PPN6 – Development of Procedural standards and guidelines for the historic environment.

All work must be carried out in compliance with the codes of practice of the Institute of Field Archaeologists and must follow the IFA Standard and Guidance for Archaeological Field Evaluations, Excavation or Watching Briefs as appropriate. www.archaeologists.net

Notification

The County Archaeologist needs to know when archaeological fieldwork is taking place in Tyne and Wear so that he can inform the local planning authority and can visit the site to monitor the work in progress. The Archaeological Contractor must therefore inform the County Archaeologist of the start and end dates of the Evaluation. He must also keep the County Archaeologist informed as to progress on the site. The CA must be informed of the degree of archaeological survival and of any significant finds. The Client will give the County Archaeologist reasonable access to the development to undertake monitoring.

PROJECT INITIATION

PROJECT DESIGN

Because this is a detailed specification, the County Archaeologist does not require a Project Design from the appointed archaeologist. However a health and safety statement and risk assessment, identifying potential risks in a risk log (see template in appendix 2 of The MoRPHE Project Manager's Guide) and specifying suitable countermeasures and contingencies, is required to be submitted to the commissioning client.

The Management of Research Projects in the Historic Environment (MoRPHE) – The MoRPHE Project Managers' Guide 2006 contains general guidance on Risk management (section 2.3.2, Appendix 2).

Risk assessments must be produced in line with legislative requirements (for example the Health and Safety at Work Act 1974, the Management of Health and Safety at Work Regulations 1999, the Control of Substances Hazardous to Health (COSHH) Regulations 2002

and the Personal Protective Equipment at Work Regulations 2002) and best practice e.g. as set out in the SCAUM (Standing Conference on Archaeological Unit Managers) Health and Safety Manual http://www.scaum.org/uk

Detailed information on hazards and how to carry out a risk assessment can be obtained from the Health and Safety Executive (www.hse.gov.uk) and the local authority health and safety department.

Specific guidance for land contamination and archaeology can be obtained from the Institute for Archaeologists (www.archaeologists.net), the Construction Industry Research and Information Association (www.contaminated-land.org) and the Association of Geotechnical and Geoenvironmental Specialists (www.ags.org.uk). See also Environment Agency, 2005 "Guidance on Assessing the Risk Posed by Land Contamination and its Remediation on Archaeological Resource Management".

The Archaeological Contractor must be able to provide written proof that the necessary levels of Insurance Cover are in place. The Archaeological Contractor must detail measures taken to ensure the safe conduct of excavations, and must consult with the client's structural engineers concerning working in close proximity to the foundations of the surrounding buildings. The Client may wish to see copies of the Archaeological Contractor's Health and Safety Policies.

The Archaeological Contractor must maintain a Site Diary for the benefit of the Client, detailing the nature of work undertaken on a day by day basis, with full details of Site Staff present, duration of time on site, etc. and contact with third parties.

PROJECT EXECUTION

1) Archaeological evaluation

The appointed archaeological contractor will decide where best to put the trenches to avoid the most obviously landscaped parts of the site. The dimensions of the four trenches are each 1.5m x 20m in plan at base. The trenches will be located on the sites of former buildings as shown on the plan of 1945 (figure 10 in the desk based assessment).

A trench location plan will be sent to the Archaeology Officer for approval before starting work. Trench locations can be adjusted to avoid services or for practical or safety purposes. Trenches can be widened if feasible in order to step the sides to reach depths over 1.2m where necessary, otherwise shoring will be required. Trenches must avoid known services.

Trenches must stay a safe distance away from pylons and overhead power lines. The commissioning client will advise of any ecological or biodiversity issues which need to be taken into consideration. The commissioning client will advise of any protected trees which must be avoided by the evaluation. Damage to trees covered by a Tree Protection Order carries a substantial fine.

Trench positions should be accurately surveyed prior to excavation and tied in to the national grid. The trenches should be excavated to the depth natural subsoil if this can be reached safely.

Tasks

Hand excavation, recording and environmental sampling (as stipulated below) of deposits down to the depth specified above. Any modern overburden or levelling material can be machined-off using a wide toothless ditching bucket under strict archaeological supervision and the remaining deposits are to be excavated by hand. All faces of the trench that require examination or recording will be cleaned.

Excavation is to be carried out with a view to avoid damage to any archaeological features which appear to worthy of preservation in-situ. Excavation is to be carried out by single context planning and recorded on *pro-forma* context sheets. Features over 0.5 m in diameter can be half sectioned.

Environmental sampling (and where relevant scientific dating) are compulsory parts of the evaluation exercise. All tenders will give a price for the assessment, full analysis, report production and publication per environmental and scientific dating sample as a contingency.

Samples will be taken of bricks from any brick-built structures. The dimensions of the bricks and the type of bonding must be recorded. Scientific investigations should be undertaken in a manner consistent with "The Management of Archaeological Projects", English Heritage 1991 and with "Archaeological Science at PPG16 Interventions: Best Practice for Curators and Commissioning Archaeologists", English Heritage, 2003. Advice on the sampling strategy for environmental samples and samples for scientific dating etc. must be sought from Jacqui Huntley, English Heritage Regional Advisor for Archaeological Science (jacqui.huntley@english-heritage.org.uk or 07713 400387) before the evaluation begins. See Appendix 1 for more information.

See Appendix 2 for guidance on procedures relating to human remains.

See Appendix 4 for guidance on Treasure Act procedures.

The spoil can be kept close-by and rapidly backfilled into the trenches at the conclusion of this work.

Recording

A full written, drawn (accurate scale plans, elevations and section drawings) and photographic record (of all contexts in black and white print and colour transparency with clearly visible graduated metric scale) will be made. The finished report must include a plan and section of each trench (even where no archaeological remains are recorded) plus plans and sections through excavated archaeological features.

The plans will include at least two site grid points and will show section line end points.

The plans will depict building material (i.e. brick and stone) where a complex of structures has been found.

Where there is a complex of interlocking multi-phased structures, a phasing plan will also be included.

There will be elevation drawings of any standing structures such as walls.

Pro-forma context sheets will be used.

All deposits and the base of the trench will be levelled. Levels will be expressed as metres above Ordnance Datum.

Stratigraphy shall be recorded even when no archaeological features have been recognised.

A 'Harris' matrix will be compiled where stratified deposits are recorded.

2) Post-excavation and report production

Finds Processing and Storage

The Archaeological Contractor will process and catalogue the finds in accordance with Museum and Galleries Commissions Guidelines (1992) and the UKIC Conservation Guidelines, and arrange for the long term disposal of the objects on behalf of the Client. A catalogue of finds and a record of discard policies, will be lodged with the finds for ease of curation. Finds shall be recorded and processed in accordance with the IFA Guidelines for

Finds Work

Finds will be assessed by an experienced finds specialist. Human and animal bone assemblages should be assessed by a recognised specialist (see Appendices 2 and 3 for more information). Industrial slag and metal working debris will be assessed by a specialist. Assessment should include x-radiography of all iron objects (after initial screening to exclude recent debris) and a selection of non-ferrous artefacts (including all coins). Refer to "Guidelines on the x-radiography of archaeological metalwork, English Heritage, 2006.

Brick dimensions will be measured and a note made of the bonding material. If necessary, pottery sherds and bricks should be recommended for Thermoluminescence dating.

Finds processing, storage and conservation methods must be broadly in line with current practice, as exemplified by the IFA "Standard and guidance for the collection, documentation, conservation and research of archaeological materials", 2001. Finds should be appropriately packaged and stored under optimum conditions, as detailed in the RESCUE/UKIC publication "First Aid for Finds"

(Watkinson and Neal 1998). Proposals for ultimate storage of finds should follow the UKIC publication "Guidelines for the Preparation of Excavation Archives for Long-term Storage" (Walker 1990). Details of methodologies may be requested from the Archaeological Contractor.

Other useful guidance – "A Strategy for the Care and Investigation of Finds",

English Heritage, 2003, "Finds and Conservation Training Package", English Heritage, 2003.

All objects must be stored in appropriate materials and conditions to ensure minimal deterioration. Advice can be sought from Jacqui Huntley of English Heritage (07713 400387) where necessary.

PRODUCTS

The report

1. The Archaeological Contractor must produce an interim report of 200 words minimum, two weeks after the completion of the field-work, for the Client and the Planning Authority, with a copy for information to the County Archaeologist. This will contain the recommendations for any further work needed on site.

2. The production of Site Archives and Finds Analysis will be undertaken according to English Heritage Guidelines - Managing Archaeological Projects 2nd Edition ('MAP2') 1991 and Management of Research Projects in the Historic Environment (MoRPHE) 2006.

3. A full archive report or post-excavation assessment, with the following features should be produced within six months of the completion of the fieldwork. All drawn work should be to publication standard. The report must include:

* Location plans of trenches and grid reference of site

* Site narrative – interpretative, structural and stratigraphic history of the site

* Plans showing major features and deposit spreads, by phase, and section locations

* Sections of the two main trench axes and through excavated features with levels

* Elevation drawings of any walls etc. revealed during the excavation

* Artefact reports – full text, descriptions and illustrations of finds

* Tables and matrices summarising feature and artefact sequences.

* Archive descriptions of contexts, grouped by phase (not for publication)

* Deposit sequence summary (for publication/deposition)

* Colour photographs of trenches and of archaeological features and finds

* Laboratory reports and summaries of dating and environmental data, with collection methodology.

* A consideration of the results of the field-work within the wider research context (ref. NERRF).

* Recommendations for further work on site, or further analysis of finds or environmental samples

* Copy of this specification

4. Three bound and collated copies of the report need to be submitted:

• one for the commissioning client

• one for the planning authority (Sunderland City Council) – this must be formally submitted by the developer to the planning department with the appropriate fee.

• one for deposition in the County HER at the address below. A digital copy of the report on CD is also required by the HER in a plastic case. Please do not attach this to the report. The report and CD for the HER must be sent by the archaeological consultant or their client directly to the address below. If the report is sent via the planning department, every page of the report will be stamped with the planning application number which ruins the illustrations. The HER is also often sent a photocopy instead of a bound colour original which is unacceptable.

Publication

If significant archaeological features are found during the evaluation, the results may also warrant publication in a suitable archaeological journal. The tender should therefore include an estimated figure for the production of a short report of, for example 20 pages, in a journal such as Archaeologia Aeliana, the Arbeia Journal, Industrial Archaeology Review or Durham Archaeological Journal. This is merely to give the commissioning client an indication of potential costs. Before preparing a paper for publication, the archaeological contractor must discuss the scope, length and suitable journal with the County Archaeologist.

Archive Preparation and Dissemination

The archive should be a record of every aspect of an archaeological project – the aims and methods, information and objects collected, results of analysis, research, interpretation and publication. It must be as complete as possible, including all relevant documents, records, data and objects {Brown, 2007, 1}.

The site archive (records and materials recovered) should be prepared in accordance with Managing Archaeological Projects, Second Edition, 5.4 and appendix 3 (HBMC 1991), MoRPHE Project Planning Notes 2006 PPN3 – Archaeological Excavation, "Archaeological documentary archives" IFA Paper No. 1, "Archaeological Archives – creation, preparation, transfer and curation"Archaeological Archives Forum etc., Guidelines for the Preparation of Excavation Archives for Long Term Storage (UKIC 1990) and "Archaeological Archives – A guide to best practice in creation, compilation, transfer and curation" by Duncan H. Brown, Archaeological Archives Forum, July 2007.

Documentary Archive

The documentary archive comprises all records made during the archaeological project, including those in hard copy and digital form. This should include written records, indexing, ordering, quantification and checking for consistency of all original context sheets, object records, bulk find records, sample records, skeleton records, photographic records (including negatives, prints, transparencies and x-radiographs), drawing records, drawings, level books, site note-books, spot-dating records and conservation records, publication drafts, published work, publication drawings and photographs etc.

A summary account of the context record, prepared by the supervising archaeologist, should be included. All paper-based material must at all times be stored in conditions that minimise the risk of damage, deterioration, loss or theft. Do not fold documents. Do not use self-adhesive labels or adhesive or tape of any kind. High quality paper (low-acid) and permanent writing materials must be used.

Original drawings on film must be made with a hard pencil, at least 4H. Do not ink over original pencil drawings. Use polyester based film for drawings (lasts longer than plastic).

Store documents in acid-free, dust-proof cardboard boxes. Store documents flat. All documents must be marked with the project identifier (e.g. site code) and/or the museum accession number. All types of record must use a consistent terminology and format.

Use non-metal fastenings, and packaging and binding materials that ensure the longevity of documents. Copies of reports and appropriate drafts, with associated illustrative material, must be submitted for inclusion with the archive.

Material Archive

The material archive comprises all objects (artefacts, building materials or environmental remains) and associated samples of contextual materials or objects. All artefacts and ecofacts retained from the site must be packed in appropriate materials. All finds must be cleaned as appropriate to ensure their long-term survival.

All metal objects retained with the archive must be recorded by x-radiograph (except gold or lead alloys or lead alloys with a high lead content and objects too thick to be x-rayed effectively e.t.c.)

All finds must be marked or labelled with the project and context identifiers and where relevant the small-finds number. Use tie-on rot-proof labels where necessary. Bulk finds of the same material type, from the same context, may be packed together in stable paper or polythene bags. Mark all bags on the outside with site and context identifiers and the material type and include a polyethylene label marked with the same information.

Use permanent ink on bags and labels. Sensitive finds must be supported, where appropriate, on inert plastic foam or acid-free tissue paper. It is not advisable to wrap objects in tissue as the unwrapping could cause damage.

The archive will be placed in a suitable form in the appropriate museum (typically the Museum of Antiquities for Newcastle (stores in Bedson Building and at Team Valley) and Tyne and Wear Museums for the rest of Tyne and Wear (check with these institutions) with the landowner's permission. Contact Andrew Parkin at the Museum of Antiquities (0191 2228996) and Alex Croom at Tyne and Wear Museums (0191 4544093).

A letter will be sent to the County Archaeology Officer within six months of the report having been submitted, confirming where the archive has been deposited.

Digital Archive

See MoRPHE Technical Guide 1 – Digital Archiving & Digital Dissemination 2006.

SIGNPOSTING

OASIS

The Tyne and Wear County Archaeologist supports the Online Access to the Index of Archaeological Investigations (OASIS) project. This project aims to provide an online index/access to the large and growing body of archaeological grey literature, created as a result of developer-funded fieldwork.

The archaeological contractor is therefore required to register with OASIS and to complete the online OASIS form for their evaluation at http://www.oasis.ac.uk/.

Please ensure that tenders for this work takes into account the time needed to complete the form.

Once the OASIS record has been completed and signed off by the HER and NMR the information will be incorporated into the English Heritage Excavation Index, hosted online by the Archaeology Data Service.

The ultimate aim of OASIS is for an online virtual library of grey literature to be built up, linked to the index. The unit therefore has the option of uploading their grey literature report as part of their OASIS record, as a Microsoft Word document, rich text format, pdf or html format. The grey literature report will only be mounted by the ADS if both the unit and the HER give their agreement. The grey literature report will be made available through a library catalogue facility.

Please ensure that you and your client understand this procedure. If you choose to upload your grey literature report please ensure that your client agrees to this in writing to the HER at the address below.

For general enquiries about the OASIS project aims and the use of the form please contact: Mark Barratt at the National Monuments Record (tel. 01793 414600 or oasis@english-heritage.org.uk). For enquiries of a technical nature please contact: Catherine Hardman at the Archaeology Data Service (tel. 01904 433954 or oasis@ads.ahds.ac.uk). Or contact the Tyne and Wear Archaeology Officer at the address below.

The tender

Tenders for the work should contain the following:-

1. Brief details of the staff employed and their relevant experience

2. Details of any sub-contractors employed

3. A quotation of cost, broken down into the following categories:-

* Costs for the excavation, incl. sub-headings of staff costs on a person-day basis, transport, materials, and plant etc.

* Post-excavation costs, incl. storage materials

* Cost of Environmental analysis and scientific dating per sample

* Estimated cost for full publication of results in an archaeological journal

* Overheads

4. An indication of the required notification period (from agreement to start date) for the field-work; the duration of fieldwork and the expected date for completion of the post-excavation work (a maximum of 6 months after completion of the fieldwork)

Monitoring

The Archaeological Contractor will inform the County Archaeologist of the start and end dates of the excavation to enable the CA to monitor the work in progress. Should important archaeological deposits

be encountered, the County Archaeologist must be informed. If further archaeological evaluation is required on this site, then the archaeological contractor must submit a written scheme of investigation for approval by the CA before extending the size of the trenches.

APPENDICES

1 Environmental Sampling, Scientific Analysis and Scientific Dating

This is a compulsory part of the evaluation exercise. Scientific investigations should be undertaken in a manner consistent with "The Management of Archaeological Projects", English Heritage 1991 and with "Archaeological Science at PPG16 Interventions: Best Practice for Curators and Commissioning Archaeologists", English Heritage, 2003.

Aims of environmental sampling – to determine the abundance/concentration of the material within the features and how well the material is preserved, to characterise the resource (the site) and each phase, to determine the significance of the material and its group value, what crop processing activities took place on the site? What does this tell us about the nature of the site? Is there any evidence for changes in the farming practice through time? How did people use this landscape? Can we place certain activities at certain locations within the site?

Function and date of individual features such as pits, hearths etc. Are the charred assemblages the result of ritual deposition or rubbish? Is the charcoal the result of domestic or industrial fuel?

Advice on the sampling strategy for environmental samples and samples for scientific dating etc. must be sought from Jacqui Huntley, English Heritage Regional Advisor for Archaeological Science (07713 400387) before the evaluation begins. The sampling strategy should include a reasoned justification for selection of deposits for sampling.

Deposits should be sampled for retrieval and assessment of the preservation conditions and potential for analysis of biological remains (English Heritage 2002). Flotation samples and samples taken for coarse-mesh sieving from dry deposits should be processed at the time of fieldwork wherever possible. Sieving recovers fish, amphibian, small bird and mammal bone, small parts of adult mammals and young infused bones which may be under-represented otherwise. However it is noted that clay soils in this region make sieving difficult. Discuss the potential for sieving with Regional Advisor for Archaeological Science.

Environmental samples (bulk soil samples of 30-40 litres volume) will be collected by the excavator from suitable (i.e. uncontaminated) deposits. It is suggested that a large number of samples be collected during evaluation from which a selection of the most suitable (uncontaminated) can be processed. All tenders will give a price for the assessment, full analysis, report production and publication per sample. The full 30-40 litre sample must be assessed by the laboratory, not just a small sub-sample.

Deposits will be assessed for their potential for radiocarbon, archaeomagnetic (guidance is available in the Centre for Archaeology Guideline on Archaeometallurgy 2001) and Optically Stimulated Luminescence dating. Timbers will be assessed for their potential for dendrochronology dating. Sampling should follow procedures in "Dendrochronology: guidelines on producing and interpreting dendrochronological dates", Hillam, 1998. All tenders will quote the price of these techniques per sample.

The following information should be provided with the environmental samples to be processed – brief account of nature and history of the site, aims and objectives of the project, summary of archaeological results, context types and stratigraphic relationships, phase and dating information, sampling and processing methods, sample locations, preservation conditions, residuality/contamination etc.

Laboratory processing of samples shall only be undertaken if deposits are found to be reasonably well dated, or linked to recognisable features and from contexts the derivation of which can be understood with a degree of confidence.

A range of features, and all phases of activity, need to be sampled for charred plant remains and charcoal. Aceramic features should not be avoided as the plant remains from these features may help to date them. Deep features should be sampled in spits to pick up changes over time. Part, or all of each of the contexts should be processed. In general samples should be processed in their entirety. All flots should be scanned, and some of the residues.

Pollen

Pollen samples can be taken from features such as lakes, ponds, palaeochannels, estuaries, saltmarshes, mires, alluvium and colluvium, and from waterlogged layers in wells, ditches and latrines etc. Substances such as honey, beer or food residues can be detected in vessels. Activities such as threshing, crop processing and the retting of flax can be identified. When taken on site, pollen samples should overlap. Your regional science advisor can advise on the type of corer or auger which would be most appropriate for your site. Samples need to be wrapped in clingfilm and kept dark and cool. Make a description of the sediments in which the pollen was found, and send this with the sample to be assessed.

Forams and diatoms

Coastal or estuary sites (even those which are now well drained) are suitable for sampling for foraminifera. Diatoms can also be found on marine sites, but also in urban settings (sewers, wells, drains, ditches etc). They only survive in waterlogged conditions. These aquatic microfossils are used as proxy indicators of the former aquatic ecological conditions on site, changes in sea levels and temperature, salinity, PH and pollution. Forams are taken from cores, monolith tins or bulk samples. Diatoms are cut from monolith tins or cores or taken as spot

samples.

Insects

Insects, which are useful as palaeoenvironmental indicators, survive best in waterlogged deposits such as palaeochannels and wells. They can provide information on climate change and landscape reconstruction as some species are adapted to particular temperatures, habitats or even particular trees. Certain insects can indicate the function of a feature or building (eg. Weevils, which were introduced by the Romans, often indicate granary sites, parasites will indicate the presence of particular animals such as sheep or horse, latrine flies survive in the

mineral deposits in latrines, or in the daub of medieval buildings etc). Samples need to be sealed (eg. in a plastic box).

Industrial Activity

Where there is evidence for industrial activity, macroscopic technological residues should be collected by hand. Separate samples should be collected for microslags (hammer-scale and spherical droplets). Guidance should be sought from the English Heritage Regional Science Adviser on the sampling strategy for metalworking features and advice on cleaning and packaging. Specialist on-site advice must be sought on identification of metalworking features. Slag and metal working debris must be assessed by a specialist. Scientific analysis (such as x-ray fluorescence, chemical analysis, metallography or scanning electron microscope) of slag can provide information on the melting temperature, chemical composition (is it iron, zinc, copper etc), microstructure (the type and shape of the crystals), physical properties (the hardness or viscosity), isotopic composition (strontium_87 or strontium_88 etc) and mineralogical composition. Guidance is available in the English Heritage "Archaeometallurgy" guidelines, 2001; "Archaeomagnetic dating", 2006 and "Guidelines on the X-radiography of archaeological metalwork", 2006. See also Historical Metallurgy Society, 2008, "Metals and metalworking: a research framework for archaeometallurgy".

Buried soils and sediments

Buried soils and sediment sequences should be inspected and recorded on site by a recognised geoarchaeologist. Procedures and techniques in the English Heritage document "Environmental Archaeology", 2002 and "Geoarchaeology", 2004 should be followed.

Wood

Sampling strategies for wooden structures should follow the methodologies presented in "Waterlogged wood. Guidelines on the recording, sampling, conservation and curation of waterlogged wood" R. Brunning, 1996. If timbers are likely to be present on your site, contact a wood specialist beforehand. Preexcavation planning – determine questions to ask, agree on a sampling strategy, allocate reasonable time and budget. Soil samples should be taken of the sediments surrounding the timber. Keep the timbers wet! Record them asap onsite – plan, photograph, record the size and orientation of the wood (radial, tangential,transverse), any toolmarks, joints, presence of bark, insect damage, recent breaks, and if another piece of wood was on top of or below the piece sampled. Both vertical and horizontal positioning of wattling must be recorded. Wood samples can provide information on woodland management such as medieval coppicing, type of taxa (native or foreign), conversion technology (how the wood was turned into planks), building techniques and type of tools used. Suitable samples should be submitted for dendrochronological dating. See English Heritage guidelines, 2004, "Dendrochronology".

Leather and organic materials

Waterlogged organic materials should be dealt with following recommendations in "Guidelines for the care of waterlogged archaeological leather", English Heritage and Archaeological Leather Group 1995.

2 Animal Bone

Animal bone can explore themes such as hunting and fowling, fishing, plant use, trade network, seasonality, diet, butchery, animal husbandry, food procurement, age structures, farrowing areas, species ratios, local environment. Domestic animal bone was used in prehistoric and Roman cremation rituals. Post medieval cattle bones – small cow bones invariably represent animals which produced high quality buttermilk for cheese. Big 'improved' cattle with large bones were produced for large quantities of meat and poorer quality milk. Large and small cattle bones are often found together on post medieval sites, usually with less of the small bones.

Animal bone assemblages should be assessed by a recognised specialist. The specialist will need to know a brief account of the nature and history of the site, an account of the purpose, methods (details of sampling) for recovery of animal bones, and the main aims and results of the excavation, details of any specific questions that the excavator wants the animal bone specialist to consider, information about other relevant finds from the excavation (e.g. bone tools, fishing equipment, weaving equipment), specific information about each context that has produced significant quantities of animal bone (recovery method, phase, context type, position in relation to major structures, contamination by more recent material, some indication of the amount of bone (by weight or by container size). See "Ancient Monuments Laboratory Advisory Note, "Assessment of animal bone collections from excavations", Sebastian Payne, 1991and "The Assessment of a collection of animal bones", S. Davis, n.d., Ancient Monuments Laboratory.

Fish bone – there was some herring exploitation in the early medieval period. Christian fasting from around 970 allowed fish to be eaten on Fridays which led to a huge demand for fish. There was an increase in marine fishing, fish trade and fish consumption (cod, haddock, ling, herring etc) around 1000 AD. Middens provide evidence of commercial fishing. There was a decline in freshwater fish (cyprinid or carp, salmon, smelt, eel, pike) from the eleventh century.

Smoking fish is a recent practice. They were previously air dried and salted. Newcastle was a major port. Samples should be sieved to retrieve fish and bird bones along with small parts of other animal skeletons and young infused bones. A crane bone was recovered from excavations at Tuthill Stairs, Newcastle – a rare find. Herring bones are so small that they can only be retrieved by 2mm sieving. Clay soils are difficult to sieve, hot water can help. Acidic soils mean poor preservation of bone.

See English Heritage 2002, "Environmental Archaeology – a guide to the theory and practice of methods from sampling and recovery to post excavation", Centre of Archaeology Guideline 1. Isotope analysis can determine where the fish were coming from – North Sea, Scandinavia, Newfoundland, Iceland etc.

There is an excellent reference collection of fish bone at York. Fish bones should be archived to museums for future dating and isotope analysis where this is not undertaken as part of the post-excavation process.

www.fishlab.org

3 Human Remains

Human remains must be treated with care, dignity and respect. Excavators must comply with the relevant legislation (essentially the Burial Act 1857) and local environmental health concerns. If found, human remains must be left in-situ, covered and protected. The archaeological contractor will be responsible for informing the police, coroner, local Environmental Health department and the County Archaeologist. If it is agreed that removal of the remains is essential, the archaeological contractor will apply for a licence from the Home Office and their regulations must be complied with.

Site inspection by a recognised osteologist is desirable for isolated burials and essential for cemeteries. The remains will be recorded in-situ and subsequently lifted, washed in water (without additives). They will be marked and packed to standards compatible with "Excavation and post-excavation treatment of cremated and inhumed human remains", McKinley and Roberts, 1993. After excavation, the remains will be subject to specialist assessment. Analysis of the osteological material should take place according to published guidelines "Human Remains from Archaeological Sites, Guidelines for producing assessment documents and analytical reports, English Heritage, 2002.

Some of the potential benefits from the study of human skeletons – demography, growth profiles, patterns of disease, genetic relationships, activity patterns, diet, burial practices, human evolution. New scientific techniques available include DNA and stable isotope analyses.

Diseases which yield ancient DNA – leprosy, syphilis, tuberculosis, mycobacterium bovis (animal form of TB passed to humans when they shared a living space from Neolithic period onwards). Cremation destroys the crown of the tooth so it cannot be dated (the closure of the cranium vault can be used in adults for dating instead). Cremation also fragments bone, distorts it due to lack of water, shrinks the bone, causes microstructural alteration and destroys organic components (so DNA analysis not possible).

The final placing of the remains after scientific study and analysis will be agreed beforehand.

Further guidance is available in:

"Guidance for best practice for treatment of human remains excavated from

Christian burial grounds in England", The Church of England and English Heritage, 2005 (www.english-heritage.org.uk/upload/pdf/16602_HumanRemains1.pdf)

"Church Archaeology: its care and management", Council for the Care of Churches, 1999

The Advisory Panel on the Archaeology of Christian burials in England can provide free well-informed advice with consideration of relevant religious, ethical, legal, archaeological and scientific issues. Panel's website:

http://www.britarch.ac.uk/churches/humanremains/index.html

or email the secretary simon.mays@english-heritage.org.uk

4 Treasure

Defined as:

• Any metallic object, other than a coin, provided that at least 10% by weight of metal is precious metal and that is at least 300 years old when found

• Any group of two or more metallic objects of any composition of prehistoric date that come from the same find

• All coins from the same find provided that they are at least 300 years old when found, but if the coins contain less than 10% gold or silver there must be at least ten

• Any object, whatever it is made of, that is found in the same place as, or had previously been together with, another object that is Treasure

• Any object that would previously have been treasure trove, but does not fall within the specific categories given above. Only objects that are less than 300 years old, that are made substantially of gold or silver, that have been deliberately hidden with the intention of recovery and whose owners or heirs are unknown will come into this category

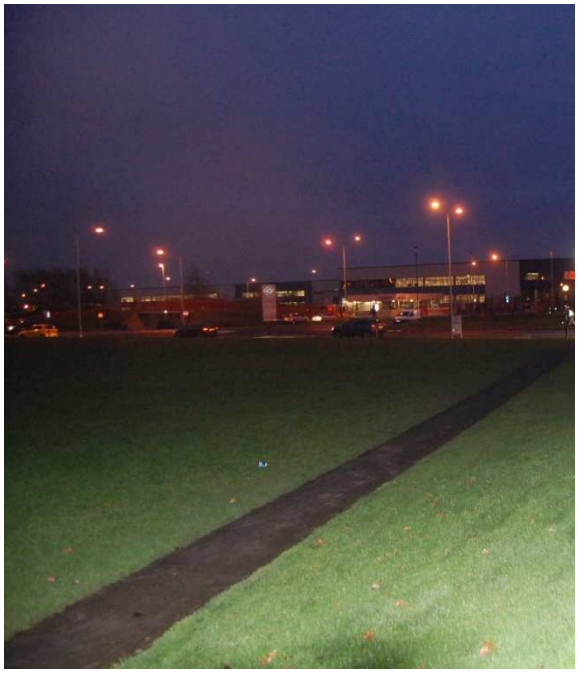
If anything is found which could be Treasure, under the Treasure Act 1996, it is a legal requirement to report it to the local coroner within 14 days of discovery. The Archaeological Contractor must comply with the procedures set out in The Treasure Act 1996. Any treasure must be reported to the coroner and to The Portable Antiquities Scheme Finds Liaison Officer, Rob Collins (0191 2225076 or Robert.Collins@newcastle.ac.uk) who can provide guidance on the Treasure Act procedures.

If you need this information in another format or language, please contact

Jennifer Morrison, Archaeology Officer.

APPENDIX 3: FIGURES

ACCESS ROAD TO A1290, NISSAN WORKS, WASHINGTON ROAD, USWORTH, TYNE AND WEAR



PRELIMINARY EVALUATION REPORT

CP. NO: 1016/09

16/12/2009

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Quality Assurance

This report covers works as outlined in the brief for the above-named project as issued by the relevant authority, and as outlined in the agreed programme of works. Any deviation to the programme of works has been agreed by all parties. The works have been carried out according to the guidelines set out in the Institute for Archaeologists (IfA) Standards, Policy Statements and Codes of Conduct. The report has been prepared in keeping with the guidance set out by North Pennines Archaeology Ltd on the preparation of reports.

REVISION SCHEDULE			
	01	**02**	**03**
PREPARED BY: **POSITION:** **DATE:**	Tony Liddell Supervisor 16/12/2009		
EDITED BY: **POSITION:** **DATE:**	Martin Railton Project Manager 16/12/2009		
APPROVED BY: **POSITION:** **DATE:**	Frank Giecco Principal Archaeologist 16/12/2009		

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SUMMARY

In December 2009, North Pennines Archaeology Limited undertook an archaeological evaluation on land off the A1290 by the Nissan Works at Washington, Sunderland, Tyne and Wear (NGR: NZ 340 588). This was at the request of MDA Developments Ltd, and was in advance of the submission of a planning application for a sustainable manufacturing centre by Gateshead College (Planning Application 09/02486/FUL).

The town of Washington is situated approximately 9km to the west of Sunderland, on the north side of the River Wear. The Nissan factory is located between Sunderland and Washington, on the west side of the A19 and to the north of the A1231, and the development site is directly north of the factory. The development site lies within an area formerly occupied by an airfield constructed in 1916. Hylton or West Moor Airfield was a Flight Station for 'B' Flight of 36 Squadron. In 1917, the airfield was renamed 'Usworth' and was used by 'A' Flight. Previous archaeological research into the site revealed that there were still buildings associated with this early airfield in 1934, with further buildings present throughout the Second World War and into the 1950s. In accordance with PPG16 and UDP Policy B14 a programme of archaeological evaluation was required to ascertain if any trace of these buildings survive.

The field evaluation consisted of four trial trenches, located to target specific remains of buildings from the First World War airfield: the Main Stores, Motor Transport Sheds and Office and the Workshops.

The trenching revealed a relatively uniform stratigraphy, with natural clay underlying all trenches at an average height of 32.83mOD. All trenches contained a modern 20th century deposit overlying the natural substrate, the top of which averaged a datum height of 33.14m. This deposit indicates the level taken during the clearance of the site with any remains of the airfield buildings removed to this depth or below. This deposit also represents the depth of overburden stripped to during the building of the Nissan Works, when the development site was used as a storage and work area: this is demonstrated by the modern crushed hardcore observed in both Trenches C and D. Trench C also showed the use of hardcore to create the landscaped bunds in the northern extent of the site, indicating that the bunds are simply landscape features rather than the remains of earlier airfield buildings.

In Trench A, a concrete drain was uncovered in the northeast corner of the trench set within the modern backfill. While this could be a remnant of the drainage system from the airfield, it is more likely to be part of a drainage system set up while the area was used as a working compound for the construction of the Nissan Works. Trench B revealed a highly truncated concrete wall footing, which bears no relation to the potential remains of the Main Stores which the trench was targeting. However, the alignment does match with the edge of the road to the east of the building, perhaps indicating that the lowest remains of the road edging still remain *in-situ*.

Overall, the trenching revealed that no remnants of the buildings targeted remain in the evaluation area, with concrete footing remains minimal at best, with the majority removed during the 1980s when the area was used as a compound during the construction of the Nissan Works to the south.

The North-East Regional Research Framework 'Shared Visions' notes that there are relatively few World War I remains in the north-east.. The Research Agenda and Strategy in this publication notes that 'remains relating to the First World War must be recorded, and that full recording is necessary of all 20th century military and defence remains where they are affected by development work'. While it is clear from the previous deskbased assessment that the development area was in use during the First and Second World Wars, the remains of the buildings from that period have been destroyed and removed during the 1980s.

ACKNOWLEDGEMENTS

North Pennines Archaeology Ltd would like to thank MDA Development Ltd for commissioning the project.

NPA Ltd would also like to thank Jennifer Morrison, Archaeology Officer for Newcastle City Council, for all her help and assistance throughout the project.

The archaeological evaluation was undertaken by Tony Liddell and Michael McElligott, with the help of machine-driver John Thralkeld. The trenches were surveyed by Matthew Town and Helen Noakes. The report was written and the drawings produced by Tony Liddell. The project was managed by Frank Giecco, Technical Director for NPA Ltd. The report was edited by Martin Railton, Project Manager for NPA Ltd.

1 INTRODUCTION

1.1 CIRCUMSTANCES OF THE PROJECT

1.1.1 In December 2009, North Pennines Archaeology Limited undertook an archaeological evaluation on land off the A1290 by the Nissan Works at Washington, Sunderland, Tyne and Wear College ([NGR: NZ 340 588]; Figure 1). This was at the request of MDA Developments Ltd, and was in advance of the submission of a planning application for a sustainable manufacturing centre by Gateshead.

1.1.2 The town of Washington is situated approximately 9km to the west of Sunderland, on the north side of the River Wear. The Nissan factory is located between Sunderland and Washington, on the west side of the A19 and to the north of the A1231, and the development site is directly north of the factory.

1.1.3 The development site lies within an area formerly occupied by an airfield constructed in 1916. Hylton or West Moor Airfield was a Flight Station for 'B' Flight of 36 Squadron. In 1917, the airfield was renamed 'Usworth' and was used by 'A' Flight. Previous archaeological research into the site revealed that there were still buildings associated with this early airfield in 1934, with further buildings present throughout the Second World War and into the 1950s (Wooler 2009). In accordance with PPG16 and UDP Policy B14 a programme of archaeological evaluation was required to ascertain if any trace of these buildings survive.

1.1.4 This report sets out the results of the work in the form of a short document outlining the findings, followed by a statement of the archaeological potential of the area, an assessment of the impact of the proposed development, and recommendations for further work.

2 METHODOLOGY

2.1 ARCHAEOLOGICAL BRIEF

2.1.1 A *Specification for Preliminary Archaeological Evaluation at Land off access road to A1290, Nissan, Washington Road, Usworth* (Morrison 2009) was produced by Newcastle City Council and a subsequent trench location plan submitted by North Pennines Archaeology Limited on behalf of the client, MDA Developments Limited, for an archaeological evaluation of the development area. The specification and trench location was agreed upon in consultation with the Archaeology Officer for Newcastle City Council.

2.1.2 Following acceptance of the trench location plan by Newcastle City Council, North Pennines Archaeology Ltd was commissioned by MDA Developments Ltd to undertake the work. The specification and trench location plan was adhered to in full, and the work was consistent with the relevant standards and procedures of the Institute for Archaeologists (IfA), and generally accepted best practice.

2.2 ARCHAEOLOGICAL EVALUATION

2.2.1 The field evaluation consisted of four trial trenches, with Trench A measuring 10.0m in length by 1.60m in width, and Trenches B-D 5.0m in length by 3.0m in width. The trenches were located to target specific remains of buildings from the Second World War airfield: the Main Stores, Motor Transport Sheds and Office and the Workshops.

2.2.2 The location and size of the trial trenches were agreed by consultation between North Pennines Archaeology Ltd and Jennifer Morrison, Archaeology Officer for Newcastle City Council.

2.2.3 The aims of the evaluation can be summarised as follows:

- to establish the presence/absence, nature, extent and state of preservation of archaeological remains and to record these where they are observed;
- to establish the character of those features in terms of cuts, soil matrices and interfaces;
- to recover artefactual material, especially that useful for dating purposes;
- to recover palaeoenvironmental material where it survives in order to understand site and landscape formation processes.

2.3 METHODOLOGY

2.3.1 The trenches were located using Trimble Zeiss 3601 Total Station survey using coordinates from the trench location plan.

2.3.2 The trenches were excavated by a mechanical excavator equipped with a toothless 1.6m wide ditching bucket, under archaeological supervision, to the top of the natural substrate. Each trench was then manually cleaned and any putative archaeological features investigated and recorded according to the North Pennines Archaeology Ltd standard procedure as set out in the NPA Excavation Manual (Giecco 2003).

2.3.3 A photographic record was made using digital photography, 400 ISO Black and White print and 200 ISO Colour Slide film.

2.3.4 All work was undertaken in accordance with the Institute for Archaeologists Standards and Guidance for Archaeological Field Evaluations (IfA 2008).

2.4 THE ARCHIVE

2.4.1 A full professional archive has been compiled in accordance with the specification, and in line with current UKIC (1990) and English Heritage Guidelines (1991) and according to the Archaeological Archives Forum recommendations (Brown 2007). The archive, including the physical and paper archive and copies of the report, will be sent to Tullie House, Carlisle, and will be made available upon request. The archive can be accessed under the unique project identifier NPA09, GCN-A, CP 1016/09.

2.4.2 North Pennines Archaeology supports the **O**nline **A**cces**S** to the **I**ndex of Archaeological Investigation**S** (**OASIS**) project. This project aims to provide an on-line index and access to the extensive and expanding body of grey literature, created as a result of developer-funded archaeological work. As a result, details of the results of this project will be made available by North Pennines Archaeology, and can be accessed under the unique identification number *northpen3- 69355*.

3 BACKGROUND

3.1 LOCATION AND GEOLOGICAL CONTEXT

3.1.1 The city of Sunderland is located in the north-east of England, approximately 16km to the south-east of Newcastle upon Tyne and c.14km to the north-east of Durham. The town of Washington is situated approximately 9km to the west of Sunderland, on the north side of the River Wear. The Nissan factory is located between Sunderland and Washington, on the west side of the A19 and to the north of the A1231.

3.1.2 The topography of the area in and around Sunderland is determined by the geological structure. The strata found in the area are carboniferous coal measures and deposited Permian limestone overlay by glacial drift and alluvium. This limestone overlay rises in a more or less gentle slope under its blanket of glacial drift from the coast to a western escarpment about 500ft above sea level (Countryside Commission 1998).

3.2 HISTORICAL CONTEXT

3.2.1 *Introduction:* this historical background is compiled from the Desk Based Assessment (Wooler 2009) and is intended only as a summary of historical developments specific to the study area.

3.2.2 The place name Usworth is thought to stem from the Old English "burn by Osa's road".

3.2.3 ***Prehistoric Period (pre c.AD 43)***: no prehistoric activity located close to the proposed development area was noted in material consulted for the Desk Based Assessment. The Archaeological Data Service, however, contains an entry in its online catalogue for a possible prehistoric or Roman rectilinear site within an oval enclosure at grid reference NZ 333 90, to the north-west of Usworth airfield, between the Three Horse Shoes and North Moor Farm.

3.2.4 In the nearby vicinity, evidence for human settlement and activity in the Hylton area comes largely from findspots. In 1885 a dug-out canoe was found in the bed of the River Wear at Hylton. A second similar canoe was already known to Sunderland Museum as they had in their collection a photograph showing a fragmentary example. This canoe was believed to have been dredged from the River Wear between Hylton Dene and Southwick. The two canoes are suggested to have dated to the late Bronze Age or the Iron Age. Other prehistoric finds within the locality of Hylton include a bronze socketed axe from the Wear and two late Bronze Age swords from the Wear at Ford. The axe and two swords (which are of the Park Ewart type) are considered to be c.900-700BC.

3.2.5 In the wider landscape, prehistoric activity is evidenced by Bronze Age burials at Humbleton Hill and Hastings Hill, and Mesolithic and Neolithic flints and arrowheads have been found at Grindon, all on the south side the River Wear. Mesolithic to late Bronze/early Iron Age occupation have been discovered at Bishopwearmouth, also on the south side of the Wear, and prehistoric burials and enclosures are known at Fulwell and Carley Hill on the north side of the river, and to the east of Hylton.

3.2.6 ***Romano-British Period (c.AD 43-400)***: in 1939, a hoard of Roman coins were found at Washington Station. The hoard contained 59 coins including one minted during the reign of Emperor Constantine (possibly 4th century AD). There is no evidence as yet for activity during this period in close proximity to the proposed development area although the cropmarks already referred to may date to this period. It has been mentioned by Mr Fulton at the North East Aircraft Museum, that 'Roman remains' were found during preparatory work for the construction of the Nissan plant on the former airfield. No written confirmation of this has, however, been found during the desk-based assessment.

3.2.7 The main evidence for occupation of the area around Sunderland during this period is in the form of burials and coins. In 1759 a cist containing a large skeleton was uncovered at Fulwell during limestone quarrying. Two coins dating from the beginning of the 3rd century were found close by. To the north, near the Carley Hill quarry, a bronze figurine of Jupiter Dolichenus, a Romano-British god, was discovered in 1820. In 1971 the hill also yielded two Roman coins dating from the 2nd to the 3rd centuries. To the west at Southwick quarry, pieces of Roman pottery, including the remains of a late 4th century cooling pot were found in 1927. Coins from the period have also been found at and around Hylton, as well as a possible Roman milestone inscribed with a dedication to the Emperor Gordian (AD 238-44) found in the Wear and recorded by the prominent antiquarian, Robert Surtees, although its exact find spot is unknown.

3.2.8 ***Early Medieval Period (c.AD 400-1066)***: the only evidence for activity or settlement during this period comes from place names, as already referred to in 3.2.2 above. What is now known as Tyne and Wear was certainly an important area during this period as show by early Christian sites such as Jarrow (HER 1227), Tynemouth (HER 124-9) and Monkwearmouth which was founded by Bishop Bishop in 674AD (HER 87). There is no evidence of activity during this period in close proximity to the proposed development area, although as with earlier periods this does not mean a total absence of settlement or land use.

3.2.9 ***Medieval Period (c.AD 1066-1485)***: there is no evidence of medieval activity in the vicinity of the proposed development area. It is possible that the land may have been on the edges of Hylton Castle estate, and may have been waste, common or agricultural in nature.

3.2.10 Hylton Castle, located to the east of the proposed development area and now surrounded by housing, was built by Sir William Hylton as a gatehouse style fortified manor house. Although no construction records survive, the style of the architecture and coats of arms on the west front mean that it dates to the 1390s or the first decade of the 1400s. Other buildings may have existed on the site at this time, as the inventory taken on Sir William's death in 1435 mentions a hall, four chambers, two barns, a kitchen and the chapel in addition to the castle. Early in the 18th century, Baron John Hylton made the first major alterations. He completely redesigned the interior and inserted large windows in the fashionable Italianate style. His son, John, made even greater alterations. He built a south wing and added crenallations to both wings. When he died in 1746, the Hyltons sold the castle, as there was no male heir to inherit it. Successive owners failed to maintain it, and in 1863 it was bought by William Briggs, who knocked down the north and south wings, gutted the interior and added new windows. The chapel at Hylton Castle, dedicated to St Catherine, is known to have existed on the site since 1157, when it was likely that Hylton Castle was a wooden building. Nothing remains of the first chapel and the ruins seen today date from the early 15th century.

3.2.11 Like the rest of Monkwearmouth parish, Hylton had presumably been part of the lands of the Anglian monastery, but after the Norman Conquest it did not pass with the other townships to the priory's monastic cell. From the 12th century, and perhaps earlier, the manor and township of Hylton belonged to the Hilton family who took their name from the estate. There is evidence that there was a mill at Hylton by the late 12th century, although its precise location if unknown. If it was a watermill if may have stood at Hylton Dene. In later centuries a windmill was sited to the north of the castle.

3.2.12 ***Post-Medieval Period (c.AD 1485-1900)***: writing in 1967, Bennett refers to the 'Blackwood' located beside Usworth Aerodrome, as providing some idea of what the countryside was like in the area before any clearance was undertaken, although the exact location of the 'Blackwood' does not appear to be shown on any historical mapping. He noted that the land between Biddick Forest and the Three Horse Shoes was drained in 1820. Oak was mainly grown in Biddick Forest, and for centuries it was exported from Sunderland port, providing a considerable trade in hardwood as well as coal.

3.2.13 Nearby Hylton Castle was the site of skirmishes during the Civil War in the middle of the 17th century. Corfe noted that these skirmishes took place on high ground to the north of the castle in 1644.

3.2.14 Industries along the Wear appear to have been well established by the early 19th century. Parson and White refer to industry at Southwick (1¼ miles north-west of Sunderland and to the east of Hylton) on the north bank of the river, which included several shipyards, lime-kilns and earthenware and glass manufactories. The trade directory in Parson and White lists the trades in the township of Hylton in 1828, these appear to be more agricultural in nature rather than industrial, apart from Auston Dixon & Co, earthenware manufacturers at Hylton Ferry and Robert Reay, shipbuilder and timber merchant at the same location. Farms such as Cow Stand (occupied by Marmaduke Robinson), West Moor (Thomas Reed) and South Moor (George and James Curry), all previously located within close proximity to the proposed development area, were all in existence at this date. The Three Horse Shoes is listed as occupied by John Merriman, victualler and blacksmith, at 'Road Stone' in Hylton township; this may be an earlier name for the site although it is not shown on later mapping. North Hylton appears to have been more industrial than the rest of the township, no doubt due to its proximity to the river. Brett refers to industries such as iron ore (on land close to the ship building yards); charcoal; lamp black; grindstones and whetstones (North Hylton had quarries that yielded grindstones in the 17th and 18th centuries) which were exported all around the world; sandstone quarried from sites such as Wood House at North Hylton; tar; a pottery had been established at North Hylton in 1762 by the Maling family. The Malings had been Huguenot refugees who settle in Scarborough before moving to Sunderland. Rich clay beds and the riverside location for east of transport on the Wood House estate made it an ideal site for a pottery. The outbreak of the Crimean War in 1854 signaled an upturn in industry in North Hylton. The old pottery building was turned into a forge and iron works and shipbuilding yards sprang up on vacant lots on the riverside.

3.2.15 With reference to Hylton Colliery (or Castletown Colliery), Brett noted that the Wearmouth Coal Company bought the Wear Steel Works, 36 acres of land and 190 workmen's cottage for £37 000. The company began work on sinking the first shaft in March 1897. In October 1900 the mine was still being developed but was still producing 500 tons of coal a day. Output almost doubled when Hylton was at its peak and the workforce topped the 1000 mark. In 1907 the coal company bought the whole of the 2000 acres Hylton Castle Estate including the castle. As they already owned the coal rights the purchase was made as an investment. In the late 1970s Hylton was one of a number of small Durham collieries which ceased mining coal, the

pit finally closed in July 1979. The colliery at Hylton (located approximately 2km to the south-east of the proposed development area) was not the only colliery site in the area; Usworth Colliery is shown on the Ordnance Survey map of 1921 (HER No. 365) and a colliery also existed at Boldon to the north which opened in 1862 and closed in 1982 (HER No. 2567). There does not appear to have been any collieries within close proximity to the proposed development area.

3.2.16 The mining of coal was greatly aided by the railways. The colliery at Usworth (NZ 315 584) was served by sidings alongside what became the North Eastern Railway line from Washington to Pelaw, ½ mile north of Usworth Station. Prior to the first locomotives, trucks on these sidings were almost certainly shunted by horses33. The Pontop and South Shields Branch of the North Eastern Railway was originally the Stanhope and Tyne Railway which opened in 1834 as the first public railway on Tyneside. It carried minerals from County Durham to the Tyne and passengers from South Shields to the Durham Turnpike (HER No. 2290). The Hylton, Southwick and Monkwearmouth Railway was formed in 1871 to develop industry on the north bank of the Tyne. It opened in 1876 between the NER line at Monkwearmouth and the NER's Tyne Dock-Consett line at Southwick Junction, although the latter connection was removed shortly after. Both the Pontop and South Shields Branch of the NER and the Hylton, Southwick and Monkwearmouth branch line are located to the west and the south of the proposed development site respectively. There was no evidence that any railway lines or associated features crossed the proposed development area.

3.2.17 ***Modern (1900-Present)***: the industrial nature of the area around Sunderland, such as shipbuilding and coal mining, meant that the town and its hinterland were obvious German targets during the First World War. In April 1916, for example, a Zeppelin passed over Seaham harbour and crossed over the colliery villages towards Washington. Fourteen explosive bombs and seven incendiary bombs were dropped within five minutes. The first bomb in Sunderland landed in a yard in Peacock Street. The Zeppelin then made its way towards Monkwearmouth goods yard, hitting North Bridge Street, the tramway sheds and the Workmen's Hall (Calvert Street). The greatest amount of damage was done to Fern Street, North Bridge Street and Victor Street.

3.2.18 As a consequence of Zeppelin raids on the area around Sunderland, an airfield was created outside the town in October 1916 as a Station for 'B' Flight of No. 36 Squadron. It was originally known as Hylton, although when it was being prepared it was known as West Town Moor. Due to the increase in German bombing, the Royal Flying Corps undertook the task of Home Defence, setting up a number of squadrons, with flights spread over

the length of the British coastline. The north-east was protected by No. 36 Home Defence Squadron, which was formed by Capt. R O Abercromby at Cramlington in February 1916. No. 36 Home Defence Squadron defended the coast between Whitby and Newcastle. The main base was at Cramlington, to the north of Newcastle, with flights being attached to Seaton Carew and Ashington, as well as Hylton. By August 1918 Hylton was in use by 'A' Flight and continued as such until the Armistice, when it was just beginning to become known as Usworth.

3.2.19 Following the end of the First World War, Usworth airfield reverted to non-flying use, as was the case with many First World War aerodromes. Usworth languished unused for over a decade, apart from at least one visit by Alan Cobham's Flying Circus, until it was re-activated on March 17th 1930. From this period, the flying field was located to the south side of the road between Washington and Sunderland, and ancillary buildings were located to the north. The airfield was designed to accommodate one squadron of the recently expanded Royal Auxiliary Air Force, No. 607 (County of Durham) Squadron. North Camp was provided with living quarters and dining facilities for Officers, NCOs and airmen. It was initially proposed to erect canvas Besoneaux Hangars on the South Camp, however these were rejected in favour of the erection of a large Lamella Hangar. The South Camp also housed the Squadron Office, pilot huts, armoury, photographic hut and bombing training aids. The firing butts were alongside the railway. On 24th 1934, the airfield was opened to the public on Empire Air Day; this attracted 1300 visitors with an estimated 5000 other spectators watching the flying displays form outside the airfield. Proceeds from the Empire Air Day went to the RAF Benevolent Fund. The Empire Air Day in 1937, as well as having flying demonstrations and aerobatics, also included the erection of a dummy fort near the southern perimeter of the airfield, which was the subject of 'attacks' by the Hinds of 103 Squadron with the Demons of No. 607 Squadron 'defending'.

3.2.20 In September 1939 work commenced on the laying of two concrete runways, as well as the expansion of the airfield to the south, east and west by taking in adjoining fields. The new 2800 feet (c.900m) long runway was laid northwest to south-east, with another of similar length on a north-south heading. A new perimeter track was laid out along the airfield boundary with eight dispersal pens, each capable of holding a twin-engined aircraft. There were also 34 hard standings for single-engined fighters. Three of the older Callender Hangers were dismantled, leaving the Lamella and a single Callender hangar opposite the main gate. Additional buildings were constructed between the airfield and the road. An Operations Room was built near the Lamella hangar; this was later supplemented by an

underground Battle Headquarters near the Cow Stand Farm corner of the airfield. On the North Camp side new accommodation blocks were erected for the expected large influx of personnel which included WAAFs. On both sides of the road numerous air raid shelters were constructed. To assist in the defence of the airfield a series of dispersed sites were set up over a wide area around the site; these included a searchlight camp at the top of Ferryboat Lane and small gunposts on the Birtley Road, above the old quarries at the bottom end of Boldon Bank and along the disused railway line towards North Hylton. At Downhill Farm a large gun site was set up, and a decontamination centre was constructed well away from the airfield. During the Second World War, a watch tower was constructed on stilts on the roof of the Three Horse Shoes; the pub also acted as a Mess for Officers during this period.

3.2.21 In the publication *Archaeology of the Twentieth Century Defence Sites of Tyne and Wear: An Illustrated Guide*, several sites in and around the airfield at Usworth are listed. Of particular interest are the Pickett-Hamilton Forts, which were a form of pillbox unique to airfields, and which were often placed down the very centre of the runway. Pickett-Hamilton Forts were sunken, circular reinforced concrete pillboxes which remained flush with the airfields surface to permit the free movement of aircraft. If there was a threat of attack, however, the forts would be raised by a hand operated hydraulic jack and manned with guns.

3.2.22 Sunderland and its surrounding area did not escape bombing during the Second World War. The first bombs dropped on the district fell soon after midnight on the 22nd June 1940. Areas affected included buildings at the Old Rectory at Whitburn, a field near Church Lane and The Bents, and the Fishermen's Cottages, which narrowly escaped being demolished. An incendiary bomb fell onto Hylton Dene, 100 yards from Hylton Colliery, Castletown.

3.2.23 The airfield at Usworth had the distinction of being singled out for a major Luftwaffe attack during the Battle of Britain. On August 15th 1940, German aircraft were detected approaching the east coast of Britain. Spitfires from 72 Squadron Ackington met them off the Farne Islands, and although heavily outnumbered, several German aircraft were destroyed. The German formation then split in two, one portion making for Tyneside, while the other turned south. The Second Acklington Squadron, No. 79, encountered the northern group just off the coast and a wild dog-fight ensued. Reforming, the Hurricanes caught up with the bombers approaching Newcastle, where their primary objective would appear to have been Usworth. Harried by the Tyne guns and by more Hurricanes from Drem in

Scotland, the German 'Heinkels' made off, scattering their bombs with little effect, and leaving Usworth untouched.

3.2.24 For much of the Second World War, Usworth was used for training, with pilots of several nations stationed there, including Polish, Czech, Canadian, Australians, Americans and New Zealanders. The training of new pilots up to operational status was a hazardous activity with many aircraft damaged or destroyed during this period. Many of these pilots have their last resting place in Castletown cemetery near the airfield.

3.2.26 Following the end of the Second World War, Usworth was home to No. 31 Gliding School which had formed around 1944. The role of the Gliding School was to provide elementary flying training to cadets of the Air Training Corps from local squadrons in the north-east. In 1951 control of Usworth passed to No. 2 Basic Air Navigation School which disbanded in 1953 when control passed to Durham University Air Squadron. In 1958 the Gliding School, the University Air Squadron and the G.C.I aircraft were moved to RAF Ouston as Usworth was to close, although some limited use of the site was made by the Territorial Army for parachute training from tethered balloons. On 3rd July 1962, Usworth was bought by Sunderland Corporation for £27, 000 and reopened as Sunderland Airport.

3.2.27 Sunderland Corporation re-laid the runways and renovated the hangar, and in June 1963 Sunderland Flying Club came into being. On June 28th 1964 an Open Day and commemorative ceremony took place to celebrate the rebirth of what became Sunderland Airport. The Air Day in 1964 became an annual event with subsequent shows attracting greater participation. Sunderland Air Day in June 1981 attracted an estimated 50, 000 people to the airfield and surrounding hills. In the 1980s, 700 people a year made their first parachute jump at Sunderland Airport.

3.2.28 During the 1970s and 1980s, the collapse of manufacturing in the Sunderland area had a detrimental effect on employment. For example, over 34 000 jobs were lost between 1971 and 1981 alone. In the 1980s the economic outlook was bleak, although Sunderland enjoyed Development Area status and was eligible for maximum Urban Aid and EEC grants. The co-ordinated efforts of Sunderland Borough, Tyne and Wear Council, Washington Development Corporation and the government scored a major success in 1984 when they succeeded in attracting Nissan to build its new UK factory on Wearside. The massive Nissan plant was constructed on the 297 acre site of Sunderland (Usworth) Airport.

3.3 PREVIOUS WORK

3.3.1 In 2005, Archaeological Services University of Durham (ASUD) undertook an archaeological desk-based assessment and archaeological monitoring at Nissan Wind Farm (NZ 339 579, to the south of the Nissan factory). The desk-based assessment noted that although there was no direct evidence for prehistoric or Roman activity in the development area the presence of activity in the surrounding vicinity indicated that an as yet unidentified resource has the potential to exist. It was also noted that the use of the site as an airfield in the First and Second World Wars suggested that the site may have undergone significant landscaping to provide a level area for aircraft to land and take off.

3.3.2 An archaeological desk-based assessment was undertaken by On Site Archaeology Ltd (OSA) of land at Nissan Factory Business Park (located between the Nissan factory and the A1231 to the south), Washington, in July 2007 . The work concluded that there was the possibility that buried remains were present on the site, which could date from any period between the early Bronze Age and the present day. It was noted that the remains may survive as features cut into the natural subsoil and would possibly be visible immediately below the topsoil and B-horizon. The top of the archaeology was suggested to be located between 0.2m and 0.5m below the present ground surface.

3.3.3 A geophysical survey was undertaken by Met Surveys in April 2008 at Turbine Business Park, on land to the north of the A1231. The survey covered an area of approximately 20 hectares which at the time was rough pasture. The site had been in agricultural use for the past 20 years and although there were no known sites within the area, it was considered that there was the potential for buried archaeological remains to exist. The survey results revealed no features of archaeological significance, although modern services were noted to run across the site as evidence by manholes. The remains of ridge and furrow were detected in some parts of the site indicating the past agricultural use of the land, but their nature (narrow, closely spaced and straight) suggested they were of relatively modern origin.

3.3.4 Following on from the geophysical survey undertaken by Met Surveys, On Site Archaeology (OSA) conducted an archaeological evaluation on the land at Turbine Park in August 2008. Features such as the ridge and furrow and areas of disturbed ground, highlighted by the geophysical results, were targeted with the evaluation trenches. The work concluded that despite sites apparently rural appearance, it was clear that the site had been heavily re-worked during the 20th century. For example, the central, western and

northern parts of the site had been used to dispose unwanted waste material from building, which may have originated from the construction of the airfield, the test track or the nearby road. In all cases the method of dumping was the same; the topsoil was removed, the 'fill' material was dumped and then the topsoil was reinstated. The only feature potentially older than the 20th century was found in Trench 1 and consisted of a shallow linear feature containing small fragments of white-glazed pottery of 19th or 20th century date. Interestingly, the areas of ridge and furrow apparently revealed by the geophysical survey, and tested by Trenches 6, 8, 9 and 10, were not found. In the cases of Trenches 6 and 8 the presence of respectively c.0.70m thick and a 1.5m thick layer of dumped material would have prevented the detection of any preserved ridge and furrow.

3.3.5 In June 2009, North Pennines Archaeology Limited were commissioned by MDA Consulting Ltd to undertake an archaeological desk-based assessment of the current development area prior to the submission of a planning application for a sustainable manufacturing centre by Gateshead College. The desk-based assessment revealed that the proposed development area appears to have been undeveloped until the construction of the airfield at Usworth in 1916. The land appears to have been agricultural in character, despite industrial activity within close proximity (for example, the various railway branch lines, collieries and brick works). The assessment also demonstrated that Usworth Airfield started life in October 1916 as a Flight Station for 'B' Flight of 36 Squadron, and was initially known as Hylton or West Town Moor. By 1917, when it was used by 'A' Flight, it was starting to be known as Usworth. For most of its wartime career Usworth was a training station. Aerial photographs from 1934 show buildings at the airfield were located on the site of the proposed development area, with the main entrance situated in the approximate location of the present footpath. A map of 1945 shows the extent of the buildings on the site at that date; although these were mostly constructed of timber it is likely these structures sat on brick or concrete footings. An aerial photograph dating to 1941/1942 showed two cropmarks located to the west of the proposed development area; it is not known if these relate to the airfield or are totally unrelated, but they may suggest earlier activity in close proximity to the airfield site.

4 EVALUATION RESULTS

4.1 INTRODUCTION

4.1.1 The trenches were excavated down to the natural substrate where possible, followed by further hand excavation of potential archaeological features allowing an examination of any prospective archaeological remains. Trench locations are depicted in Figure 2.

4.1.2 Plans and sections of Trenches A, B and D can be found on Figure 3, and a plan and section of Trench C can be found on Figure 4.

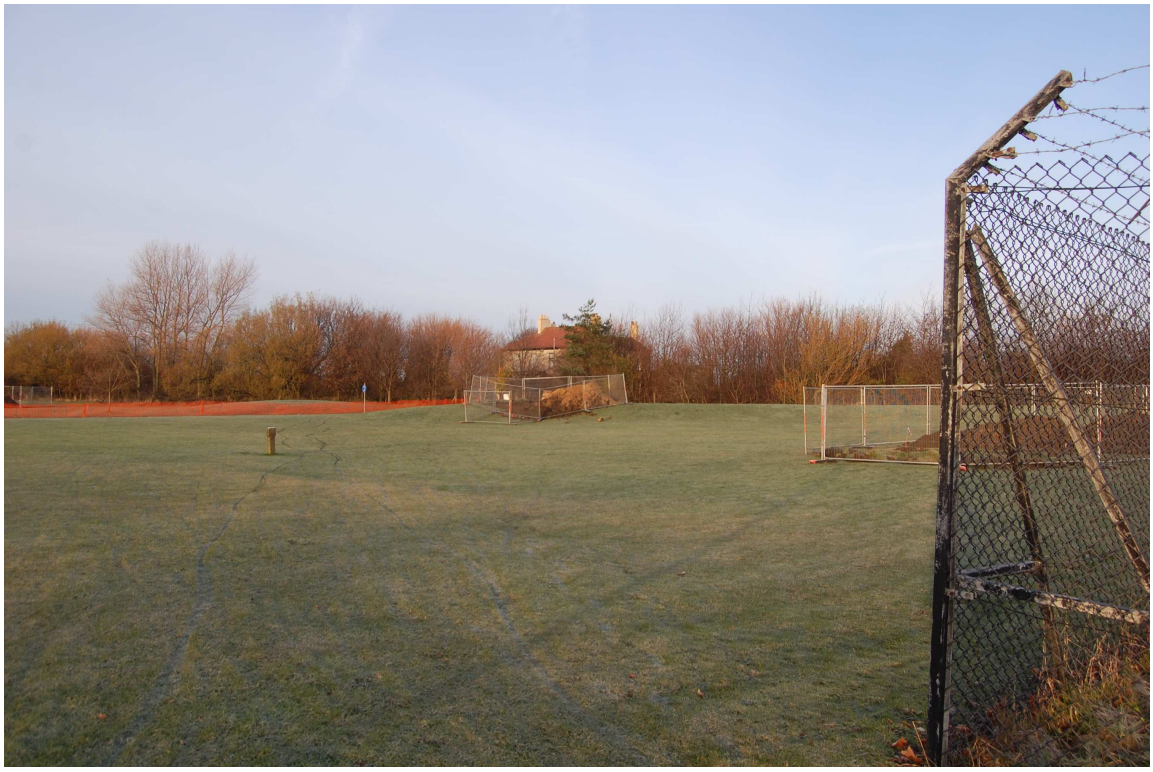

Plate 1. *The site looking northwest.*

4.2 TRENCH A

4.2.1 Trench A measured 10.00m in length and 1.60 in width, and was orientated roughly east-west.

4.2.2 The trench was located to evaluate the potential remains of the western and northern extensions of the Main Stores for the airbase, known to have been of timber construction.

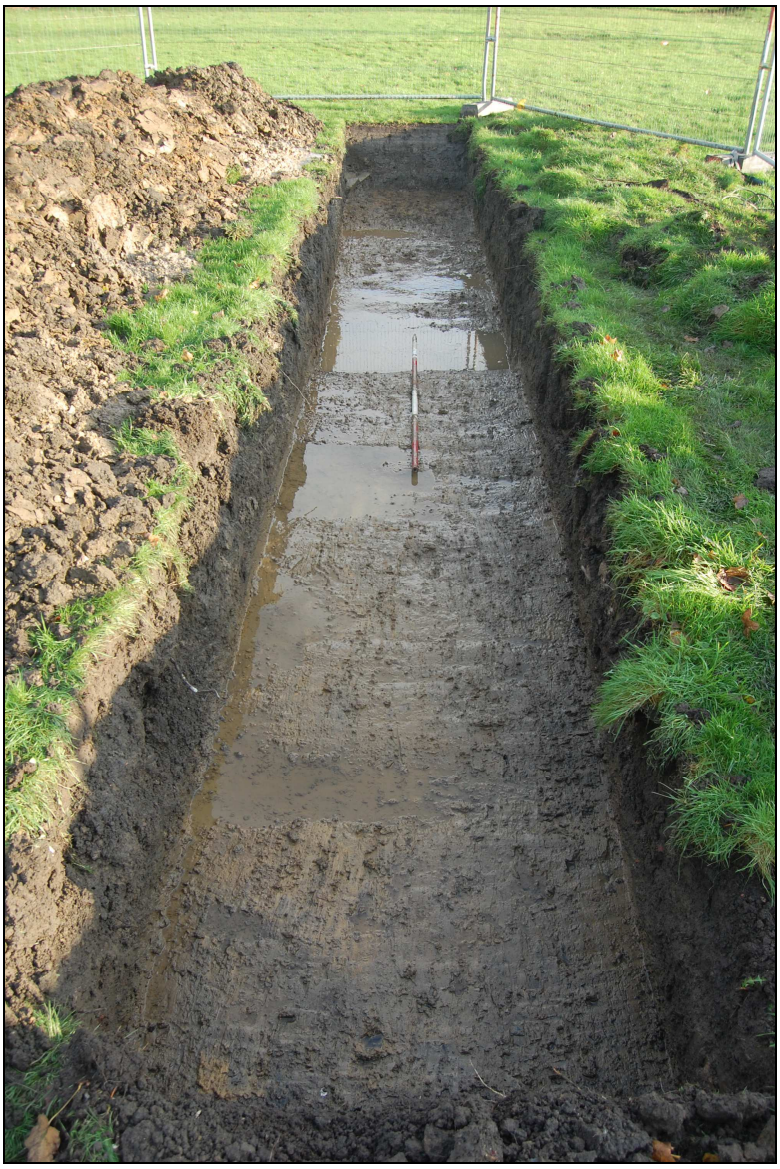

***Plate 2**. Trench A, looking east.*

4.2.3 The natural substrate, context (**102**), was found to be a compact orange/brown sandy clay averaging a depth of 0.68m below the current surface (and at an Ordnance Datum of 32.96m). Above the natural clay was a c.0.35m thick deposit of 20th century backfill, context (**104**), which was a compact mid-grey/brown silty clay with inclusions of small stones, concrete slivers and brick fragments. Above the backfill was a modern subsoil layer, context (**101**), which measured c.0.22m thick and was comprised of loose mid-brown sandy clay. Topsoil and turf, context (**100**), sealed the subsoil with an average depth of 0.14m.

4.2.4 In the north east corner of the trench the edge of a concrete drain, context (**108**), was uncovered aligned northwest-southeast, and sitting within the

modern backfill at 33.12mOD. This suggests that either the drain is not *in-situ*, or that the backfill context was laid at the same time as the drain, possibly as a packing 'foundation' layer for the building.

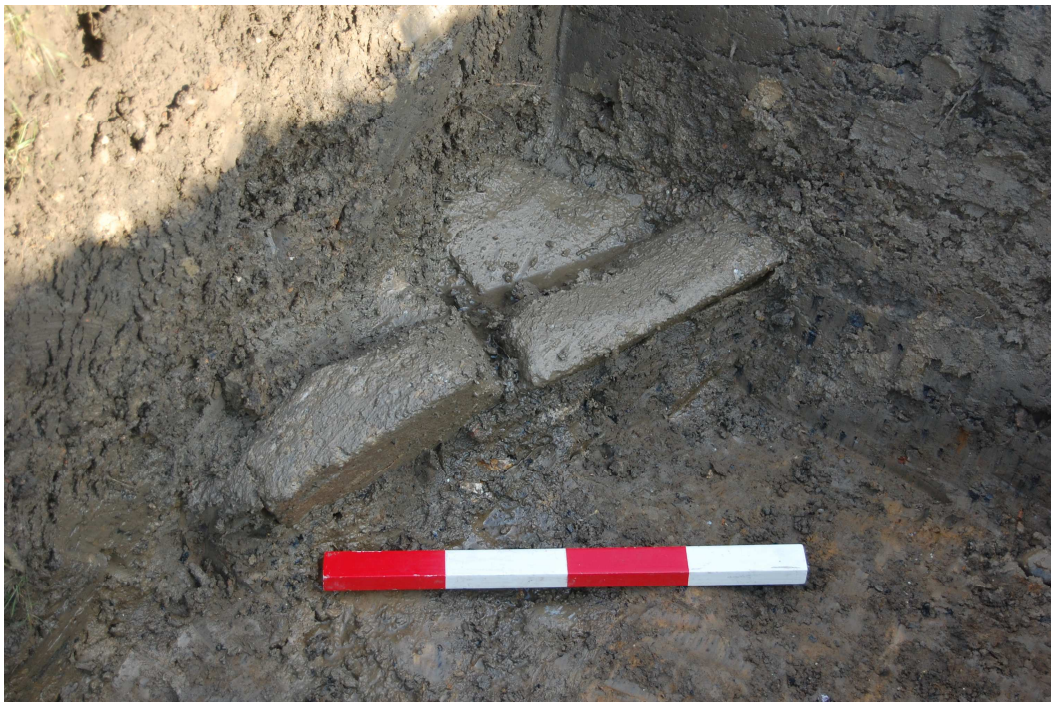

***Plate 3**. Drain (**108**) looking north-east.*

4.2.5 Fragments of late 20th century pottery and glass were recovered from context (**104**), with the other strata remaining artefactually sterile. No deposits were deemed suitable for environmental sampling.

4.3 TRENCH B

4.3.1 Trench B measured 5.0m in length and 3.0m in width, and was orientated roughly east-west .

4.3.2 The trench was located to evaluate the potential remains of the eastern extension of the Main Stores for the airbase, known to have been of timber construction.

4.3.3 The natural substrate, context (**102**), averaged a depth of 0.89m below the current surface (Ordnance Datum of 32.54m). Over the natural clay was a c.0.45m thick deposit of context (**104**), comprising 20th century backfill, above which was the modern subsoil layer, context (**101**), which measured c.0.22m

Topsoil and turf, context (**100**), sealed the subsoil with an average depth of 0.22m.

4.3.4 In the western extent of the trench was the remains of a concrete wall footing (**106**), aligned roughly northwest-southeast (Plate 5). The footing of the wall lay at 32.85m OD, measured 0.47m in width and spanned the width of the trench. The concrete lay on a thin deposit of context (**107**), a black ash and grit deposit which made up the lowest foundation strata of the wall remains.

4.3.5 Fragments of 20th century pottery and glass were recovered from context (**104**), with the other strata remaining sterile of artefacts. No deposits were deemed viable for environmental sampling.

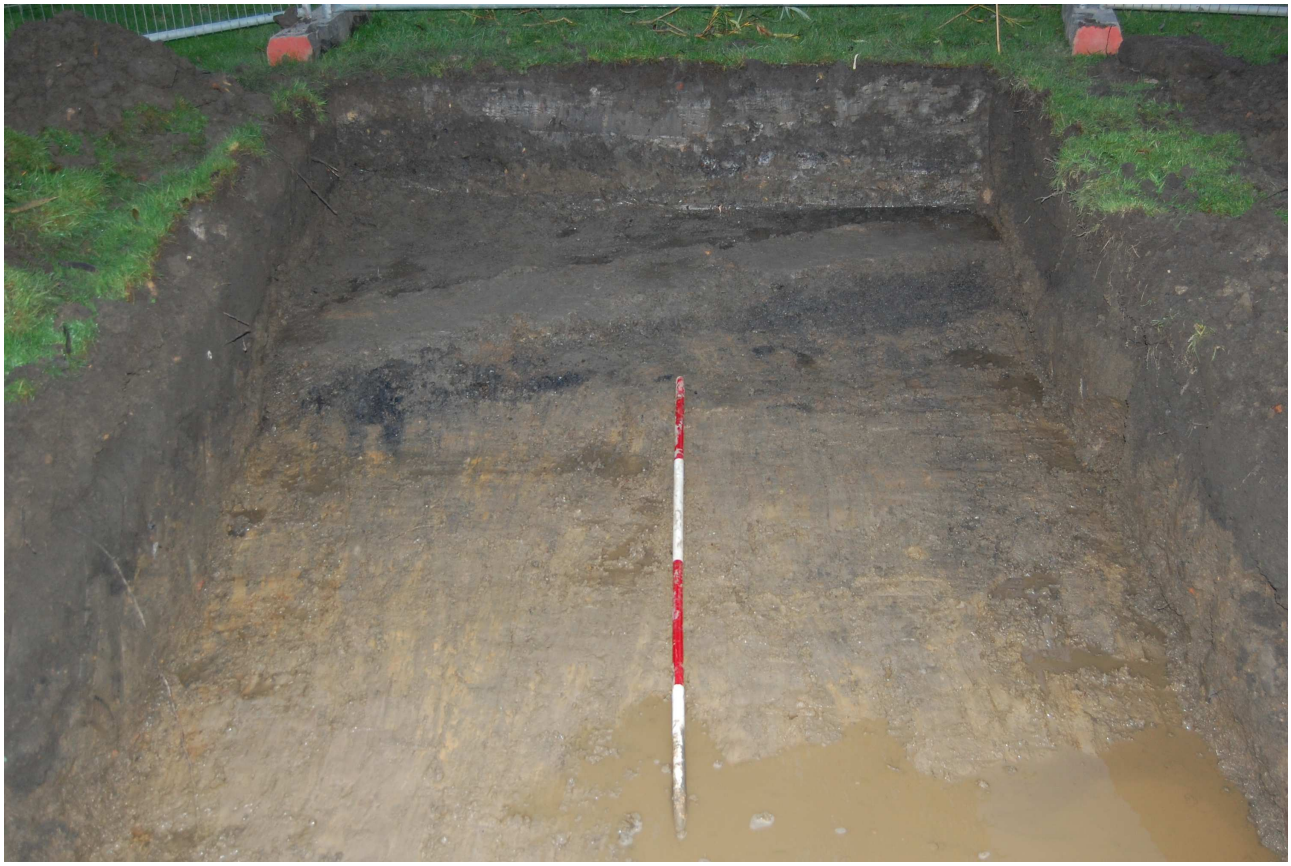

Plate 4. *Trench B, looking west.*

***Plate 5**. Wall footing (106), looking north.*

4.4 TRENCH C

4.4.1 Trench C measured 5.0m in length and 3.0m in width, and was orientated roughly north-south on the crest of a bund bordering the north side of the plot of land to the east of the dividing public path.

4.4.2 The trench was located to evaluate the potential remains of the Motor Transport Sheds and Office for the airbase, known to have been of timber construction.

4.3.3 In this trench, the natural substrate was not revealed due to the trench depth exceeding the reach of the mechanical excavator's bucket due to the trench's position on the bund. The depth excavated reached a vertical 2.02m, with the 20th century backfill layer, context (**104**), revealed 1.70m below the current surface. Over this layer was a 1.06m thick deposit of pale yellow crushed

hardcore, context (**103**), which formed the core of the bund's structure. Above the hardcore was a 0.27m thick deposit of modern subsoil, context (**101**), sealed by a 0.37m deposit of topsoil and turf, context (**100**).

4.3.4 Due to the highly unstable nature of the hardcore, the trench was stepped inwards and the deepest section of the excavation was not entered for recording purposes on Health and Safety grounds.

4.3.5 No artefactual or structural remains were recovered from this trench, and no deposits were deemed suitable for environmental sampling.

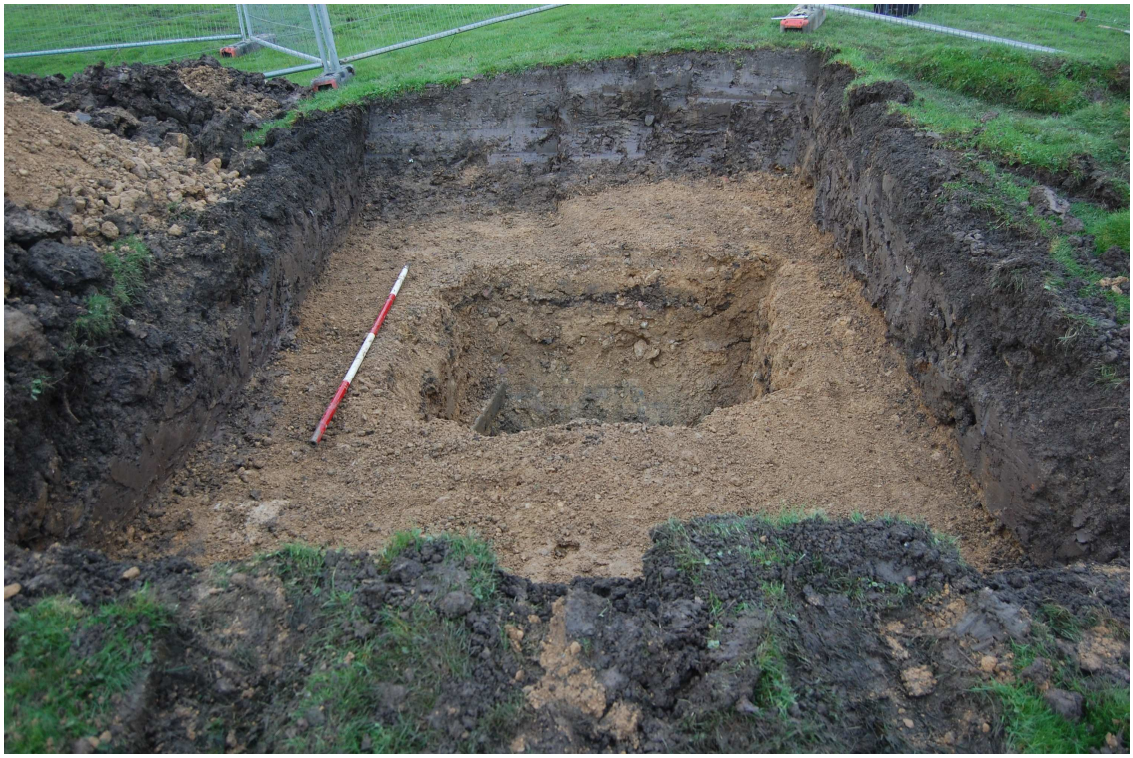

***Plate 6**. Trench C, looking south.*

4.5 TRENCH D

4.5.1 Trench D measured 5.0m in length and 3.0m in width, and was orientated roughly east-west in the eastern extent of the development area.

4.5.2 The trench was located to evaluate the potential remains of the main Workshops for the airbase, known to have been of timber construction.

4.3.3 The natural substrate, context (**102**), was found at a depth of c.0.75m below the current surface (and at an Ordnance Datum of 32.99m). Above the natural clay was a c.0.37m thick deposit of 20th century backfill, context (**104**). Above the backfill was a thin 0.06m thick deposit of pale yellow crushed hardcore, context (**103**), sealed by a c.0.17m thick layer of modern subsoil, context (**101**). As with the previous three trenches, Trench D was

sealed by topsoil and turf, context (**100**), measuring an average thickness of 0.11m.

4.3.4 At the south-western extent of the trench a concrete block, context (**105**), was found embedded in the natural clay. This block measured 0.64m in length, 0.31m in width and had a visible depth of 0.19m. The block was highly degraded, and although it could perhaps have been the remains of a concrete plinth or footing, it is more likely that it is a disturbed block pushed into the natural clay during the leveling of the site.

4.3.5 Fragments of early 20th century pottery were recovered from context (**104**), with the other strata remaining artefactually sterile. No deposits were deemed viable for environmental sampling.

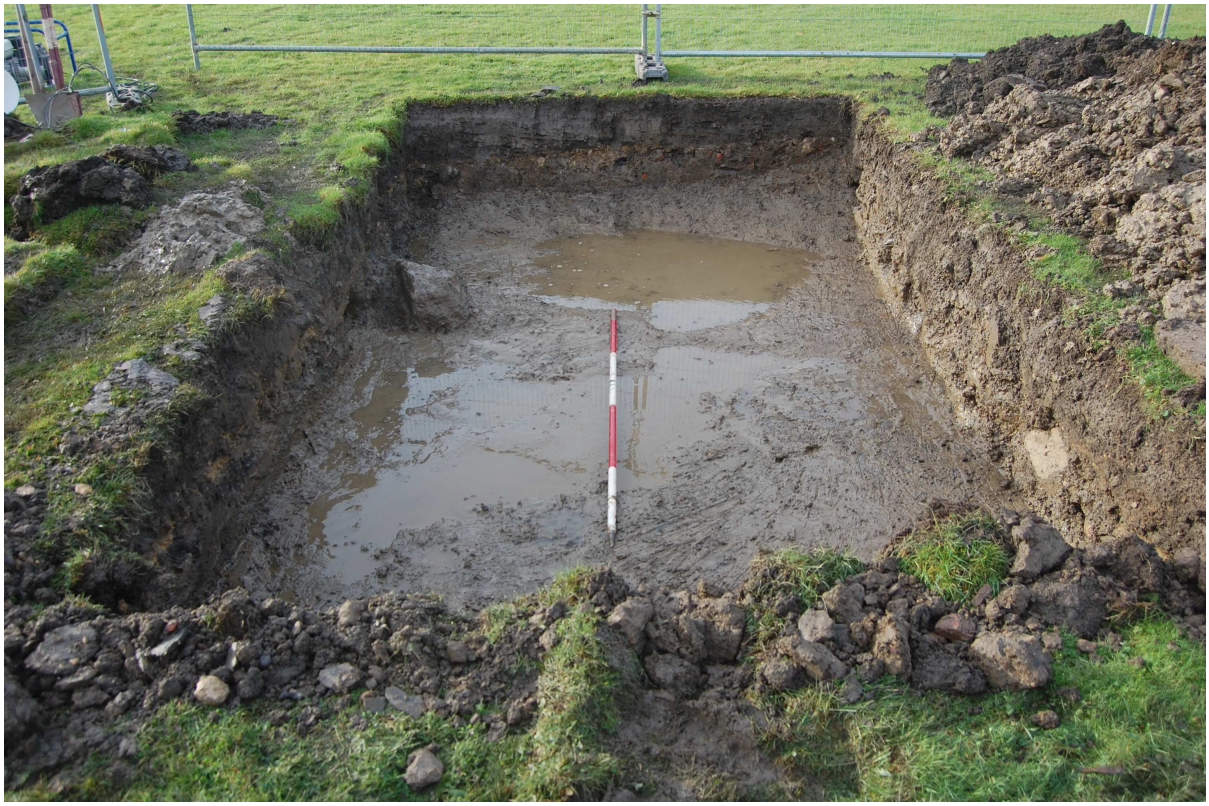

Plate 7. *Trench D, looking west.*

5 CONCLUSIONS AND RECOMMENDATIONS

5.1 CONCLUSIONS

5.1.1 The trenching revealed a relatively uniform stratigraphy, with natural clay underlying all trenches (this is assumed for Trench C) at an average height of 32.83mOD.

5.1.2 All trenches contained a modern 20th century deposit overlying the natural substrate, the top of which averaged a datum height of 33.14mOD. This deposit indicates the level taken during the clearance of the site with any remains of the airfield buildings removed to this depth or below. This deposit also represents the depth of overburden stripped to during the building of the Nissan Works, when the development site was used as a storage and work area: this is demonstrated by the modern crushed hardcore observed in both Trenches C and D. Trench C also showed the use of hardcore to create the landscaped bunds in the northern extent of the site, indicating that the bunds are simply landscape features rather than the remains of airfield buildings.

5.1.3 In Trench A, a concrete drain was uncovered in the northeast corner of the trench set within the modern backfill. While this could be a remnant of the drainage system from the airfield, it is more likely to be part of a drainage system set up while the area was used as a working compound for the construction of the Nissan Works.

5.1.4 Trench B revealed a highly truncated concrete wall footing, which bears no relation to the potential remains of the Main Stores which the trench was targeting. However, the alignment does match with the edge of the road to the east of the building, perhaps indicating that the lowest remains of the road edging still remain *in-situ*.

5.1.5 Overall, the trenching revealed that no timber remains of the buildings targeted remain in the evaluation area, with concrete footing remains minimal at best, with the majority removed during the 1980s when the area was used as a compound during the construction of the Nissan Works to the south.

5.2 RECOMMENDATIONS

5.2.1 The potential for archaeological remains within the development area remains low. Given the lack of any significant archaeological features during the evaluation it is recommended that no further work takes place.

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APPENDIX 1: CONTEXT TABLE

Context	Context Type	Description
(100)	Deposit	Modern topsoil and turf.
(101)	Deposit	Modern subsoil.
(102)	Natural Substrate	Yellow-brown compact sandy clay.
(103)	Deposit	Crushed hardcore in Trenches C and D.
(104)	Deposit	Modern backfill.
(105)	Deposit	Concrete block embedded in natural clay in Trench D.
(106)	Deposit	Concrete wall footing in Trench B.
(107)	Deposit	Packing material for wall footing (106).
(108)	Deposit	Concrete drain in Trench A.

***Table 1**. List of Contexts issued during the Evaluation*

APPENDIX 2: BRIEF

Tyne and Wear Specialist Conservation Team

Specification for Preliminary Archaeological Evaluation at Land off access road to A1290, Nissan, Washington Road, Usworth

Planning Application: 09/02486/FUL

Author:

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West Chapel

Jesmond Old Cemetery

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Date: 3 September 2009

County Archaeologist's Reference Number: MON7453

The Tyne and Wear Specialist Conservation Team is the curatorial service for archaeology, industrial archaeology and historic buildings throughout the Tyne and Wear districts. It helps and advises Newcastle, Gateshead, North Tyneside, South Tyneside and Sunderland Councils to carry out their statutory duties to care for the precious historic environment of Tyneside and Wearside. The Team can be found at the Strategic Housing, Planning and Transportation Division of the Environment & Regeneration Directorate of Newcastle City Council.

Introduction

Site grid reference: NZ 340 588

Planning permission has been granted for a two storey office and teaching facility comprising of classrooms, lecture theatre, café, offices and learning resource centre. Attached to this will be a steel portal framed training facility for motor manufacturing and productivity. An

archaeological desk based assessment has been produced (North Pennines Archaeology Ltd, June 2009). The appointed archaeologist must familiarise themselves with the results of this previous archaeological work on the site before starting work.

The report concludes that the site was undeveloped until the construction of the airfield in 1916. Hylton or West Moor Airfield was a Flight Station for 'B' Flight of 36 Squadron. By 1917 it was used by 'A' Flight and was also known as Usworth. There were buildings associated with the airfield within the development site in 1934. They were probably timber buildings on brick or concrete footings. Buildings were present throughout World War Two and into the 1950s. A plan of 1945 identifies some of the buildings within the site as a fire tender garage, MT sheds, station offices and workshops.

The eastern part of the site has been landscaped. The western side is grassed with trees and also landscaped. In accordance with PPG16 and UDP Policy B14 a programme of archaeological evaluation is required to ascertain if any trace of these buildings survives.

Research Aims and Objectives

The evaluation report should make reference to Regional and Thematic Research Frameworks. The North-East Regional Research Framework for the Historic Environment (2006) notes the importance of research as a vital element of development-led archaeological work. It sets out key research priorities for all periods of the past allowing commercial contractors to demonstrate how their fieldwork relates to wider regional and national priorities for the study of archaeology and the historic environment. The aim of NERRF is to ensure that all fieldwork is carried out in a secure research context and that commercial contractors ensure that their investigations ask the right questions.

See http://www.algao.org.uk/Association/England/Regions/ResFwks.htm

Ideally and where possible the evaluation should cross-reference its aims and objectives to national priorities, defined in SHAPE (Strategic Frameworks for Historic Environment Activities and Programmes in English Heritage), and the English Heritage Research Agenda 2005-2010.

Where appropriate note any similar nationwide projects using ADS, internet search engines, ALSF website, HEEP website, OASIS, NMR excavation index. All staff on site must understand the project aims and methodologies.

Methods statement

Four evaluation trenches are needed to inform the Planning Authority of the character, nature, date, depth, degree of survival of archaeological deposits on this site. The excavation must be carried out by a suitably qualified and experienced archaeological organisation. The work will record and environmentally sample any

archaeological deposits of importance found on the plot. The purpose of this brief is to obtain tenders for this work. The report must be the definitive record for deposition in the Tyne and Wear HER, and it must contain recommendations for any further archaeological work needed on this site. The commissioning client needs to be aware that the purpose of the preliminary

evaluation is merely to ascertain if archaeological remains survive on this site and if they do, to determine their broad date, nature and function. Where archaeological remains are found in the preliminary trenches, and if these remains are at threat by the proposed development, further archaeological excavation and or a watching brief will be required before and during development work.

All staff employed by the Archaeological Contractor shall be professional field archaeologists with appropriate skills and experience to undertake work to the highest professional standards. The work will be undertaken according to English Heritage Guidelines – Managing Archaeological Projects 2nd Edition ('MAP2') 1991 (www.englishh.gov.uk/ guidance/ map2/ index.htm) and Management of Research Projects in the Historic Environment (MoRPHE) – The MoRPHE Project Managers' Guide, Project Planning Notes and Technical Guides 2006 (www.englishheritage.org.uk/publications).

The work will be undertaken according to MoRPHE Project Planning Notes 2006 - PPN3 – Archaeological Excavation and PPN6 – Development of Procedural standards and guidelines for the historic environment.

All work must be carried out in compliance with the codes of practice of the Institute of Field Archaeologists and must follow the IFA Standard and Guidance for Archaeological Field Evaluations, Excavation or Watching Briefs as appropriate. www.archaeologists.net

Notification

The County Archaeologist needs to know when archaeological fieldwork is taking place in Tyne and Wear so that he can inform the local planning authority and can visit the site to monitor the work in progress. The Archaeological Contractor must therefore inform the County Archaeologist of the start and end dates of the Evaluation. He must also keep the County Archaeologist informed as to progress on the site. The CA must be informed of the degree of archaeological survival and of any significant finds. The Client will give the County Archaeologist reasonable access to the development to undertake monitoring.

PROJECT INITIATION

PROJECT DESIGN

Because this is a detailed specification, the County Archaeologist does not require a Project Design from the appointed archaeologist. However a health and safety statement and risk assessment, identifying potential risks in a risk log (see template in appendix 2 of The MoRPHE Project Manager's Guide) and specifying suitable countermeasures and contingencies, is required to be submitted to the commissioning client.

The Management of Research Projects in the Historic Environment (MoRPHE) – The MoRPHE Project Managers' Guide 2006 contains general guidance on Risk management (section 2.3.2, Appendix 2).

Risk assessments must be produced in line with legislative requirements (for example the Health and Safety at Work Act 1974, the Management of Health and Safety at Work Regulations 1999, the Control of Substances Hazardous to Health (COSHH) Regulations 2002

and the Personal Protective Equipment at Work Regulations 2002) and best practice e.g. as set out in the SCAUM (Standing Conference on Archaeological Unit Managers) Health and Safety Manual http://www.scaum.org/uk

Detailed information on hazards and how to carry out a risk assessment can be obtained from the Health and Safety Executive (www.hse.gov.uk) and the local authority health and safety department.

Specific guidance for land contamination and archaeology can be obtained from the Institute for Archaeologists (www.archaeologists.net), the Construction Industry Research and Information Association (www.contaminated-land.org) and the Association of Geotechnical and Geoenvironmental Specialists (www.ags.org.uk). See also Environment Agency, 2005 "Guidance on Assessing the Risk Posed by Land Contamination and its Remediation on Archaeological Resource Management".

The Archaeological Contractor must be able to provide written proof that the necessary levels of Insurance Cover are in place. The Archaeological Contractor must detail measures taken to ensure the safe conduct of excavations, and must consult with the client's structural engineers concerning working in close proximity to the foundations of the surrounding buildings. The Client may wish to see copies of the Archaeological Contractor's Health and Safety Policies.

The Archaeological Contractor must maintain a Site Diary for the benefit of the Client, detailing the nature of work undertaken on a day by day basis, with full details of Site Staff present, duration of time on site, etc. and contact with third parties.

PROJECT EXECUTION

1) Archaeological evaluation

The appointed archaeological contractor will decide where best to put the trenches to avoid the most obviously landscaped parts of the site. The dimensions of the four trenches are each 1.5m x 20m in plan at base. The trenches will be located on the sites of former buildings as shown on the plan of 1945 (figure 10 in the desk based assessment).

A trench location plan will be sent to the Archaeology Officer for approval before starting work. Trench locations can be adjusted to avoid services or for practical or safety purposes. Trenches can be widened if feasible in order to step the sides to reach depths over 1.2m where necessary, otherwise shoring will be required. Trenches must avoid known services.

Trenches must stay a safe distance away from pylons and overhead power lines. The commissioning client will advise of any ecological or biodiversity issues which need to be taken into consideration. The commissioning client will advise of any protected trees which must be avoided by the evaluation. Damage to trees covered by a Tree Protection Order carries a substantial fine.

Trench positions should be accurately surveyed prior to excavation and tied in to the national grid. The trenches should be excavated to the depth natural subsoil if this can be reached safely.

Tasks

Hand excavation, recording and environmental sampling (as stipulated below) of deposits down to the depth specified above. Any modern overburden or levelling material can be machined-off using a wide toothless ditching bucket under strict archaeological supervision and the remaining deposits are to be excavated by hand. All faces of the trench that require examination or recording will be cleaned.

Excavation is to be carried out with a view to avoid damage to any archaeological features which appear to worthy of preservation in-situ. Excavation is to be carried out by single context planning and recorded on *pro-forma* context sheets. Features over 0.5 m in diameter can be half sectioned.

Environmental sampling (and where relevant scientific dating) are compulsory parts of the evaluation exercise. All tenders will give a price for the assessment, full analysis, report production and publication per environmental and scientific dating sample as a contingency.

Samples will be taken of bricks from any brick-built structures. The dimensions of the bricks and the type of bonding must be recorded. Scientific investigations should be undertaken in a manner consistent with "The Management of Archaeological Projects", English Heritage 1991 and with "Archaeological Science at PPG16 Interventions: Best Practice for Curators and Commissioning Archaeologists", English Heritage, 2003. Advice on the sampling strategy for environmental samples and samples for scientific dating etc. must be sought from Jacqui Huntley, English Heritage Regional Advisor for Archaeological Science (jacqui.huntley@english-heritage.org.uk or 07713 400387) before the evaluation begins. See Appendix 1 for more information.

See Appendix 2 for guidance on procedures relating to human remains.

See Appendix 4 for guidance on Treasure Act procedures.

The spoil can be kept close-by and rapidly backfilled into the trenches at the conclusion of this work.

Recording

A full written, drawn (accurate scale plans, elevations and section drawings) and photographic record (of all contexts in black and white print and colour transparency with clearly visible graduated metric scale) will be made. The finished report must include a plan and section of each trench (even where no archaeological remains are recorded) plus plans and sections through excavated archaeological features.

The plans will include at least two site grid points and will show section line end points.

The plans will depict building material (i.e. brick and stone) where a complex of structures has been found.

Where there is a complex of interlocking multi-phased structures, a phasing plan will also be included.

There will be elevation drawings of any standing structures such as walls.

Pro-forma context sheets will be used.

All deposits and the base of the trench will be levelled. Levels will be expressed as metres above Ordnance Datum.

Stratigraphy shall be recorded even when no archaeological features have been recognised.

A 'Harris' matrix will be compiled where stratified deposits are recorded.

2) Post-excavation and report production

Finds Processing and Storage

The Archaeological Contractor will process and catalogue the finds in accordance with Museum and Galleries Commissions Guidelines (1992) and the UKIC Conservation Guidelines, and arrange for the long term disposal of the objects on behalf of the Client. A catalogue of finds and a record of discard policies, will be lodged with the finds for ease of curation. Finds shall be recorded and processed in accordance with the IFA Guidelines for

Finds Work

Finds will be assessed by an experienced finds specialist. Human and animal bone assemblages should be assessed by a recognised specialist (see Appendices 2 and 3 for more information). Industrial slag and metal working debris will be assessed by a specialist. Assessment should include x-radiography of all iron objects (after initial screening to exclude recent debris) and a selection of non-ferrous artefacts (including all coins). Refer to "Guidelines on the x-radiography of archaeological metalwork, English Heritage, 2006.

Brick dimensions will be measured and a note made of the bonding material. If necessary, pottery sherds and bricks should be recommended for Thermoluminescence dating.

Finds processing, storage and conservation methods must be broadly in line with current practice, as exemplified by the IFA "Standard and guidance for the collection, documentation, conservation and research of archaeological materials", 2001. Finds should be appropriately packaged and stored under optimum conditions, as detailed in the RESCUE/UKIC publication "First Aid for Finds"

(Watkinson and Neal 1998). Proposals for ultimate storage of finds should follow the UKIC publication "Guidelines for the Preparation of Excavation Archives for Long-term Storage" (Walker 1990). Details of methodologies may be requested from the Archaeological Contractor.

Other useful guidance – "A Strategy for the Care and Investigation of Finds",

English Heritage, 2003, "Finds and Conservation Training Package", English Heritage, 2003.

All objects must be stored in appropriate materials and conditions to ensure minimal deterioration. Advice can be sought from Jacqui Huntley of English Heritage (07713 400387) where necessary.

PRODUCTS

The report

1. The Archaeological Contractor must produce an interim report of 200 words minimum, two weeks after the completion of the field-work, for the Client and the Planning Authority, with a copy for information to the County Archaeologist. This will contain the recommendations for any further work needed on site.

2. The production of Site Archives and Finds Analysis will be undertaken according to English Heritage Guidelines - Managing Archaeological Projects 2nd Edition ('MAP2') 1991 and Management of Research Projects in the Historic Environment (MoRPHE) 2006.

3. A full archive report or post-excavation assessment, with the following features should be produced within six months of the completion of the fieldwork. All drawn work should be to publication standard. The report must include:

* Location plans of trenches and grid reference of site

* Site narrative – interpretative, structural and stratigraphic history of the site

* Plans showing major features and deposit spreads, by phase, and section locations

* Sections of the two main trench axes and through excavated features with levels

* Elevation drawings of any walls etc. revealed during the excavation

* Artefact reports – full text, descriptions and illustrations of finds

* Tables and matrices summarising feature and artefact sequences.

* Archive descriptions of contexts, grouped by phase (not for publication)

* Deposit sequence summary (for publication/deposition)

* Colour photographs of trenches and of archaeological features and finds

* Laboratory reports and summaries of dating and environmental data, with collection methodology.

* A consideration of the results of the field-work within the wider research context (ref. NERRF).

* Recommendations for further work on site, or further analysis of finds or environmental samples

* Copy of this specification

4. Three bound and collated copies of the report need to be submitted:

• one for the commissioning client

• one for the planning authority (Sunderland City Council) – this must be formally submitted by the developer to the planning department with the appropriate fee.

• one for deposition in the County HER at the address below. A digital copy of the report on CD is also required by the HER in a plastic case. Please do not attach this to the report. The report and CD for the HER must be sent by the archaeological consultant or their client directly to the address below. If the report is sent via the planning department, every page of the report will be stamped with the planning application number which ruins the illustrations. The HER is also often sent a photocopy instead of a bound colour original which is unacceptable.

Publication

If significant archaeological features are found during the evaluation, the results may also warrant publication in a suitable archaeological journal. The tender should therefore include an estimated figure for the production of a short report of, for example 20 pages, in a journal such as Archaeologia Aeliana, the Arbeia Journal, Industrial Archaeology Review or Durham Archaeological Journal. This is merely to give the commissioning client an indication of potential costs. Before preparing a paper for publication, the archaeological contractor must discuss the scope, length and suitable journal with the County Archaeologist.

Archive Preparation and Dissemination

The archive should be a record of every aspect of an archaeological project – the aims and methods, information and objects collected, results of analysis, research, interpretation and publication. It must be as complete as possible, including all relevant documents, records, data and objects {Brown, 2007, 1}.

The site archive (records and materials recovered) should be prepared in accordance with Managing Archaeological Projects, Second Edition, 5.4 and appendix 3 (HBMC 1991), MoRPHE Project Planning Notes 2006 PPN3 – Archaeological Excavation, "Archaeological documentary archives" IFA Paper No. 1, "Archaeological Archives – creation, preparation, transfer and curation"Archaeological Archives Forum etc., Guidelines for the Preparation of Excavation Archives for Long Term Storage (UKIC 1990) and "Archaeological Archives – A guide to best practice in creation, compilation, transfer and curation" by Duncan H. Brown, Archaeological Archives Forum, July 2007.

Documentary Archive

The documentary archive comprises all records made during the archaeological project, including those in hard copy and digital form. This should include written records, indexing, ordering, quantification and checking for consistency of all original context sheets, object records, bulk find records, sample records, skeleton records, photographic records (including negatives, prints, transparencies and x-radiographs), drawing records, drawings, level books, site note-books, spot-dating records and conservation records, publication drafts, published work, publication drawings and photographs etc.

A summary account of the context record, prepared by the supervising archaeologist, should be included. All paper-based material must at all times be stored in conditions that minimise the risk of damage, deterioration, loss or theft. Do not fold documents. Do not use self-adhesive labels or adhesive or tape of any kind. High quality paper (low-acid) and permanent writing materials must be used.

Original drawings on film must be made with a hard pencil, at least 4H. Do not ink over original pencil drawings. Use polyester based film for drawings (lasts longer than plastic).

Store documents in acid-free, dust-proof cardboard boxes. Store documents flat. All documents must be marked with the project identifier (e.g. site code) and/or the museum accession number. All types of record must use a consistent terminology and format.

Use non-metal fastenings, and packaging and binding materials that ensure the longevity of documents. Copies of reports and appropriate drafts, with associated illustrative material, must be submitted for inclusion with the archive.

Material Archive

The material archive comprises all objects (artefacts, building materials or environmental remains) and associated samples of contextual materials or objects. All artefacts and ecofacts retained from the site must be packed in appropriate materials. All finds must be cleaned as appropriate to ensure their long-term survival.

All metal objects retained with the archive must be recorded by x-radiograph (except gold or lead alloys or lead alloys with a high lead content and objects too thick to be x-rayed effectively e.t.c.)

All finds must be marked or labelled with the project and context identifiers and where relevant the small-finds number. Use tie-on rot-proof labels where necessary. Bulk finds of the same material type, from the same context, may be packed together in stable paper or polythene bags. Mark all bags on the outside with site and context identifiers and the material type and include a polyethylene label marked with the same information.

Use permanent ink on bags and labels. Sensitive finds must be supported, where appropriate, on inert plastic foam or acid-free tissue paper. It is not advisable to wrap objects in tissue as the unwrapping could cause damage.

The archive will be placed in a suitable form in the appropriate museum (typically the Museum of Antiquities for Newcastle (stores in Bedson Building and at Team Valley) and Tyne and Wear Museums for the rest of Tyne and Wear (check with these institutions) with the landowner's permission. Contact Andrew Parkin at the Museum of Antiquities (0191 2228996) and Alex Croom at Tyne and Wear Museums (0191 4544093).

A letter will be sent to the County Archaeology Officer within six months of the report having been submitted, confirming where the archive has been deposited.

Digital Archive

See MoRPHE Technical Guide 1 – Digital Archiving & Digital Dissemination 2006.

SIGNPOSTING

OASIS

The Tyne and Wear County Archaeologist supports the Online Access to the Index of Archaeological Investigations (OASIS) project. This project aims to provide an online index/access to the large and growing body of archaeological grey literature, created as a result of developer-funded fieldwork.

The archaeological contractor is therefore required to register with OASIS and to complete the online OASIS form for their evaluation at http://www.oasis.ac.uk/.

Please ensure that tenders for this work takes into account the time needed to complete the form.

Once the OASIS record has been completed and signed off by the HER and NMR the information will be incorporated into the English Heritage Excavation Index, hosted online by the Archaeology Data Service.

The ultimate aim of OASIS is for an online virtual library of grey literature to be built up, linked to the index. The unit therefore has the option of uploading their grey literature report as part of their OASIS record, as a Microsoft Word document, rich text format, pdf or html format. The grey literature report will only be mounted by the ADS if both the unit and the HER give their agreement. The grey literature report will be made available through a library catalogue facility.

Please ensure that you and your client understand this procedure. If you choose to upload your grey literature report please ensure that your client agrees to this in writing to the HER at the address below.

For general enquiries about the OASIS project aims and the use of the form please contact: Mark Barratt at the National Monuments Record (tel. 01793 414600 or oasis@english-heritage.org.uk). For enquiries of a technical nature please contact: Catherine Hardman at the Archaeology Data Service (tel. 01904 433954 or oasis@ads.ahds.ac.uk). Or contact the Tyne and Wear Archaeology Officer at the address below.

The tender

Tenders for the work should contain the following:-

1. Brief details of the staff employed and their relevant experience

2. Details of any sub-contractors employed

3. A quotation of cost, broken down into the following categories:-

* Costs for the excavation, incl. sub-headings of staff costs on a person-day basis, transport, materials, and plant etc.

* Post-excavation costs, incl. storage materials

* Cost of Environmental analysis and scientific dating per sample

* Estimated cost for full publication of results in an archaeological journal

* Overheads

4. An indication of the required notification period (from agreement to start date) for the field-work; the duration of fieldwork and the expected date for completion of the post-excavation work (a maximum of 6 months after completion of the fieldwork)

Monitoring

The Archaeological Contractor will inform the County Archaeologist of the start and end dates of the excavation to enable the CA to monitor the work in progress. Should important archaeological deposits

be encountered, the County Archaeologist must be informed. If further archaeological evaluation is required on this site, then the archaeological contractor must submit a written scheme of investigation for approval by the CA before extending the size of the trenches.

APPENDICES

1 Environmental Sampling, Scientific Analysis and Scientific Dating

This is a compulsory part of the evaluation exercise. Scientific investigations should be undertaken in a manner consistent with "The Management of Archaeological Projects", English Heritage 1991 and with "Archaeological Science at PPG16 Interventions: Best Practice for Curators and Commissioning Archaeologists", English Heritage, 2003.

Aims of environmental sampling – to determine the abundance/concentration of the material within the features and how well the material is preserved, to characterise the resource (the site) and each phase, to determine the significance of the material and its group value, what crop processing activities took place on the site? What does this tell us about the nature of the site? Is there any evidence for changes in the farming practice through time? How did people use this landscape? Can we place certain activities at certain locations within the site?

Function and date of individual features such as pits, hearths etc. Are the charred assemblages the result of ritual deposition or rubbish? Is the charcoal the result of domestic or industrial fuel?

Advice on the sampling strategy for environmental samples and samples for scientific dating etc. must be sought from Jacqui Huntley, English Heritage Regional Advisor for Archaeological Science (07713 400387) before the evaluation begins. The sampling strategy should include a reasoned justification for selection of deposits for sampling.

Deposits should be sampled for retrieval and assessment of the preservation conditions and potential for analysis of biological remains (English Heritage 2002). Flotation samples and samples taken for coarse-mesh sieving from dry deposits should be processed at the time of fieldwork wherever possible. Sieving recovers fish, amphibian, small bird and mammal bone, small parts of adult mammals and young infused bones which may be under-represented otherwise. However it is noted that clay soils in this region make sieving difficult. Discuss the potential for sieving with Regional Advisor for Archaeological Science.

Environmental samples (bulk soil samples of 30-40 litres volume) will be collected by the excavator from suitable (i.e. uncontaminated) deposits. It is suggested that a large number of samples be collected during evaluation from which a selection of the most suitable (uncontaminated) can be processed. All tenders will give a price for the assessment, full analysis, report production and publication per sample. The full 30-40 litre sample must be assessed by the laboratory, not just a small sub-sample.

Deposits will be assessed for their potential for radiocarbon, archaeomagnetic (guidance is available in the Centre for Archaeology Guideline on Archaeometallurgy 2001) and Optically Stimulated Luminescence dating. Timbers will be assessed for their potential for dendrochronology dating. Sampling should follow procedures in "Dendrochronology: guidelines on producing and interpreting dendrochronological dates", Hillam, 1998. All tenders will quote the price of these techniques per sample.

The following information should be provided with the environmental samples to be processed – brief account of nature and history of the site, aims and objectives of the project, summary of archaeological results, context types and stratigraphic relationships, phase and dating information, sampling and processing methods, sample locations, preservation conditions, residuality/contamination etc.

Laboratory processing of samples shall only be undertaken if deposits are found to be reasonably well dated, or linked to recognisable features and from contexts the derivation of which can be understood with a degree of confidence.

A range of features, and all phases of activity, need to be sampled for charred plant remains and charcoal. Aceramic features should not be avoided as the plant remains from these features may help to date them. Deep features should be sampled in spits to pick up changes over time. Part, or all of each of the contexts should be processed. In general samples should be processed in their entirety. All flots should be scanned, and some of the residues.

Pollen

Pollen samples can be taken from features such as lakes, ponds, palaeochannels, estuaries, saltmarshes, mires, alluvium and colluvium, and from waterlogged layers in wells, ditches and latrines etc. Substances such as honey, beer or food residues can be detected in vessels. Activities such as threshing, crop processing and the retting of flax can be identified. When taken on site, pollen samples should overlap. Your regional science advisor can advise on the type of corer or auger which would be most appropriate for your site. Samples need to be wrapped in clingfilm and kept dark and cool. Make a description of the sediments in which the pollen was found, and send this with the sample to be assessed.

Forams and diatoms

Coastal or estuary sites (even those which are now well drained) are suitable for sampling for foraminifera. Diatoms can also be found on marine sites, but also in urban settings (sewers, wells, drains, ditches etc). They only survive in waterlogged conditions. These aquatic microfossils are used as proxy indicators of the former aquatic ecological conditions on site, changes in sea levels and temperature, salinity, PH and pollution. Forams are taken from cores, monolith tins or bulk samples. Diatoms are cut from monolith tins or cores or taken as spot

samples.

Insects

Insects, which are useful as palaeoenvironmental indicators, survive best in waterlogged deposits such as palaeochannels and wells. They can provide information on climate change and landscape reconstruction as some species are adapted to particular temperatures, habitats or even particular trees. Certain insects can indicate the function of a feature or building (eg. Weevils, which were introduced by the Romans, often indicate granary sites, parasites will indicate the presence of particular animals such as sheep or horse, latrine flies survive in the

mineral deposits in latrines, or in the daub of medieval buildings etc). Samples need to be sealed (eg. in a plastic box).

Industrial Activity

Where there is evidence for industrial activity, macroscopic technological residues should be collected by hand. Separate samples should be collected for microslags (hammer-scale and spherical droplets). Guidance should be sought from the English Heritage Regional Science Adviser on the sampling strategy for metalworking features and advice on cleaning and packaging. Specialist on-site advice must be sought on identification of metalworking features. Slag and metal working debris must be assessed by a specialist. Scientific analysis (such as x-ray fluorescence, chemical analysis, metallography or scanning electron microscope) of slag can provide information on the melting temperature, chemical composition (is it iron, zinc, copper etc), microstructure (the type and shape of the crystals), physical properties (the hardness or viscosity), isotopic composition (strontium_87 or strontium_88 etc) and mineralogical composition. Guidance is available in the English Heritage "Archaeometallurgy" guidelines, 2001; "Archaeomagnetic dating", 2006 and "Guidelines on the X-radiography of archaeological metalwork", 2006. See also Historical Metallurgy Society, 2008, "Metals and metalworking: a research framework for archaeometallurgy".

Buried soils and sediments

Buried soils and sediment sequences should be inspected and recorded on site by a recognised geoarchaeologist. Procedures and techniques in the English Heritage document "Environmental Archaeology", 2002 and "Geoarchaeology", 2004 should be followed.

Wood

Sampling strategies for wooden structures should follow the methodologies presented in "Waterlogged wood. Guidelines on the recording, sampling, conservation and curation of waterlogged wood" R. Brunning, 1996. If timbers are likely to be present on your site, contact a wood specialist beforehand. Preexcavation planning – determine questions to ask, agree on a sampling strategy, allocate reasonable time and budget. Soil samples should be taken of the sediments surrounding the timber. Keep the timbers wet! Record them asap onsite – plan, photograph, record the size and orientation of the wood (radial, tangential,transverse), any toolmarks, joints, presence of bark, insect damage, recent breaks, and if another piece of wood was on top of or below the piece sampled. Both vertical and horizontal positioning of wattling must be recorded. Wood samples can provide information on woodland management such as medieval coppicing, type of taxa (native or foreign), conversion technology (how the wood was turned into planks), building techniques and type of tools used. Suitable samples should be submitted for dendrochronological dating. See English Heritage guidelines, 2004, "Dendrochronology".

Leather and organic materials

Waterlogged organic materials should be dealt with following recommendations in "Guidelines for the care of waterlogged archaeological leather", English Heritage and Archaeological Leather Group 1995.

2 Animal Bone

Animal bone can explore themes such as hunting and fowling, fishing, plant use, trade network, seasonality, diet, butchery, animal husbandry, food procurement, age structures, farrowing areas, species ratios, local environment. Domestic animal bone was used in prehistoric and Roman cremation rituals. Post medieval cattle bones – small cow bones invariably represent animals which produced high quality buttermilk for cheese. Big 'improved' cattle with large bones were produced for large quantities of meat and poorer quality milk. Large and small cattle bones are often found together on post medieval sites, usually with less of the small bones.

Animal bone assemblages should be assessed by a recognised specialist. The specialist will need to know a brief account of the nature and history of the site, an account of the purpose, methods (details of sampling) for recovery of animal bones, and the main aims and results of the excavation, details of any specific questions that the excavator wants the animal bone specialist to consider, information about other relevant finds from the excavation (e.g. bone tools, fishing equipment, weaving equipment), specific information about each context that has produced significant quantities of animal bone (recovery method, phase, context type, position in relation to major structures, contamination by more recent material, some indication of the amount of bone (by weight or by container size). See "Ancient Monuments Laboratory Advisory Note, "Assessment of animal bone collections from excavations", Sebastian Payne, 1991and "The Assessment of a collection of animal bones", S. Davis, n.d., Ancient Monuments Laboratory.

Fish bone – there was some herring exploitation in the early medieval period. Christian fasting from around 970 allowed fish to be eaten on Fridays which led to a huge demand for fish. There was an increase in marine fishing, fish trade and fish consumption (cod, haddock, ling, herring etc) around 1000 AD. Middens provide evidence of commercial fishing. There was a decline in freshwater fish (cyprinid or carp, salmon, smelt, eel, pike) from the eleventh century.

Smoking fish is a recent practice. They were previously air dried and salted. Newcastle was a major port. Samples should be sieved to retrieve fish and bird bones along with small parts of other animal skeletons and young infused bones. A crane bone was recovered from excavations at Tuthill Stairs, Newcastle – a rare find. Herring bones are so small that they can only be retrieved by 2mm sieving. Clay soils are difficult to sieve, hot water can help. Acidic soils mean poor preservation of bone.

See English Heritage 2002, "Environmental Archaeology – a guide to the theory and practice of methods from sampling and recovery to post excavation", Centre of Archaeology Guideline 1. Isotope analysis can determine where the fish were coming from – North Sea, Scandinavia, Newfoundland, Iceland etc.

There is an excellent reference collection of fish bone at York. Fish bones should be archived to museums for future dating and isotope analysis where this is not undertaken as part of the post-excavation process.

www.fishlab.org

3 Human Remains

Human remains must be treated with care, dignity and respect. Excavators must comply with the relevant legislation (essentially the Burial Act 1857) and local environmental health concerns. If found, human remains must be left in-situ, covered and protected. The archaeological contractor will be responsible for informing the police, coroner, local Environmental Health department and the County Archaeologist. If it is agreed that removal of the remains is essential, the archaeological contractor will apply for a licence from the Home Office and their regulations must be complied with.

Site inspection by a recognised osteologist is desirable for isolated burials and essential for cemeteries. The remains will be recorded in-situ and subsequently lifted, washed in water (without additives). They will be marked and packed to standards compatible with "Excavation and post-excavation treatment of cremated and inhumed human remains", McKinley and Roberts, 1993. After excavation, the remains will be subject to specialist assessment. Analysis of the osteological material should take place according to published guidelines "Human Remains from Archaeological Sites, Guidelines for producing assessment documents and analytical reports, English Heritage, 2002.

Some of the potential benefits from the study of human skeletons – demography, growth profiles, patterns of disease, genetic relationships, activity patterns, diet, burial practices, human evolution. New scientific techniques available include DNA and stable isotope analyses.

Diseases which yield ancient DNA – leprosy, syphilis, tuberculosis, mycobacterium bovis (animal form of TB passed to humans when they shared a living space from Neolithic period onwards). Cremation destroys the crown of the tooth so it cannot be dated (the closure of the cranium vault can be used in adults for dating instead). Cremation also fragments bone, distorts it due to lack of water, shrinks the bone, causes microstructural alteration and destroys organic components (so DNA analysis not possible).

The final placing of the remains after scientific study and analysis will be agreed beforehand.

Further guidance is available in:

"Guidance for best practice for treatment of human remains excavated from

Christian burial grounds in England", The Church of England and English Heritage, 2005 (www.english-heritage.org.uk/upload/pdf/16602_HumanRemains1.pdf)

"Church Archaeology: its care and management", Council for the Care of Churches, 1999

The Advisory Panel on the Archaeology of Christian burials in England can provide free well-informed advice with consideration of relevant religious, ethical, legal, archaeological and scientific issues. Panel's website:

http://www.britarch.ac.uk/churches/humanremains/index.html

or email the secretary simon.mays@english-heritage.org.uk

4 Treasure

Defined as:

• Any metallic object, other than a coin, provided that at least 10% by weight of metal is precious metal and that is at least 300 years old when found

• Any group of two or more metallic objects of any composition of prehistoric date that come from the same find

• All coins from the same find provided that they are at least 300 years old when found, but if the coins contain less than 10% gold or silver there must be at least ten

• Any object, whatever it is made of, that is found in the same place as, or had previously been together with, another object that is Treasure

• Any object that would previously have been treasure trove, but does not fall within the specific categories given above. Only objects that are less than 300 years old, that are made substantially of gold or silver, that have been deliberately hidden with the intention of recovery and whose owners or heirs are unknown will come into this category

If anything is found which could be Treasure, under the Treasure Act 1996, it is a legal requirement to report it to the local coroner within 14 days of discovery. The Archaeological Contractor must comply with the procedures set out in The Treasure Act 1996. Any treasure must be reported to the coroner and to The Portable Antiquities Scheme Finds Liaison Officer, Rob Collins (0191 2225076 or Robert.Collins@newcastle.ac.uk) who can provide guidance on the Treasure Act procedures.

If you need this information in another format or language, please contact

Jennifer Morrison, Archaeology Officer.

APPENDIX 3: FIGURES