CONTENTS

SUMMARY

Brian Cox requested that Oxford Archaeology North (OA North) undertake a building investigation of the former RAF 'filter' bunker at Whittingham Lane, Goosnargh, Preston, Lancashire, (SD 54950 36250) (Fig 1), prior to its proposed conversion to a single residence. Lancashire County Archaeology Service (LCAS) recommended a building investigation of English Heritage (2006) Level II standard, which included a rapid map regression in conjunction with a site investigation comprising written descriptions, an extensive photographic record, and drawings of the floor plans and sections.

The building investigation was undertaken over three days in May 2006 and was conducted thoroughly in accordance with the specification. It was evident from this inspection that some alterations had taken place during the seventy years since the bunker was built, but these were by no means extensive. Certainly, door handles and electrical fittings had been replaced, whilst several of the rooms had been remodelled with the insertion of cinder block partitions. However, there appeared to be few significant alterations, which were apparent.

The filter bunker features in several specialist pieces of literature that have been written about Second World War and Cold War sites in Britain. The bunker was constructed by the RAF in the early 1940s as part of the Langley Lane complex, which was one of four similar sites built during the 1940s, with the other three situated at Inverness, Kenton Bar (Newcastle upon Tyne) and Watnall (Nottinghamshire). Each of these installations featured three buildings comprising operations, a filter block and a communications block. This Preston-based complex served as 9 Group Operations Centre Fighter Command, with the bunker on Whittingham Lane functioning as the filter block, whilst the operations and communications facilities were situated on Langley Lane itself. The filter block was used throughout the rest of the war, and its primary function was the collation and filtering of signals and other information, prior to dissemination.

The building was then remodelled as the Western Sector base for the ROTOR radar project, during the early Cold War of the 1950s, but the project was superseded before it had even been fully implemented, in light of the burgeoning Soviet nuclear capability and the development of Soviet supersonic high-altitude bombers.

In spite of this, the complex was used by 21 Group Royal Observation Corps (ROC), working under the United Kingdom Warning and Monitoring Organisation (UKWMO) from the late 1950s onwards. The UKWMO used Langley Lane as its Western Sector Headquarters and later as its alternative supreme headquarters. This occupancy continued well into the late twentieth century until both the UKWMO and the ROC were disbanded in the early 1990s, following the end of the Cold War.

It is unclear if either the UKWMO or the ROC used the filter bunker building as part of their operations during the Cold War. For at least some of that time, the filter bunker seems to have been used in a separate capacity as the Regional Armed Forces Headquarters and was last occupied by them in 1992. Since then the facility has been left vacant, and has passed into private ownership.

ACKNOWLEDGEMENTS

Oxford Archaeology North (OA North) would like to thank Brian Cox for commissioning and supporting the project, and for providing reports and other documents relating to the bunker. Additional thanks are also due to the staff of the County Record Office in Preston.

Chris Ridings and Pip Haworth undertook the building investigation. Chris Ridings wrote the report and Mark Tidmarsh produced the drawings. Alison Plummer managed the project and also edited the report.

1. INTRODUCTION

1.1 CIRCUMSTANCES OF THE PROJECT

1.1.1 Brian Cox requested that Oxford Archaeology North (OA North) undertake a building investigation of the former RAF bunker at Whittingham Lane, Goosnargh, Preston, Lancashire, (SD 54950 36250) (Fig 1), prior to its proposed conversion. Lancashire County Archaeology Service (LCAS) recommended a building investigation of English Heritage (2006) Level II standard, which included a rapid map regression in conjunction with a site investigation comprising written descriptions, an extensive photographic record, and drawings of the floor plans and sections.

2. METHODOLOGY

2.1 PROJECT BACKGROUND

2.1.1 Following consultation with Lancashire County Archaeology Service (LCAS), OA North produced a project design (*Appendix 1*) to undertake the work. This was accepted by Brian Cox and OA North was commissioned to undertake the building investigation. This was carried out in May 2008.

2.1.2 The project consisted of a Level II type building investigation (English Heritage 2006) of the installation, which comprised a descriptive internal and external record combined with drawings and a detailed photographic record.

2.2 BUILDING INVESTIGATION

2.2.1 ***Descriptive Record***: written records using OA North *pro forma* record sheets were made of all principal building elements, both internal and external, as well as any features of historical or architectural significance. Particular attention was also paid to the relationship between the earliest and latest parts of the building, especially those that would show their development and any alterations. These records are essentially descriptive, although interpretation is carried out on site as required.

2.2.2 ***Site drawings:*** architects 'as existing' drawings were annotated to produce a ground floor plan, lower ground floor plan and a section of the facility. These were produced in order to show the form and location of structural features and/or features of historic interest. The hand-annotated field drawings were digitised using an industry standard CAD package to produce the final drawings.

2.2.3 ***Photographs:*** photographs were taken in both black and white print and colour slide 35mm formats, as well as high resolution digital format (10MP). The photographic archive consists of both general shots of the bunker, and shots of specific architectural details.

2.3 ARCHIVE

2.3.1 The results of all archaeological work carried out will form the basis for a full archive to professional standards, in accordance with current English Heritage guidelines (*Management of Archaeological Projects*, 2nd edition, 1991). The original record archive of the project will be deposited with the County Record Office at Preston.

2.3.2 The Arts and Humanities Data Service (AHDS) online database *Online Access to index of Archaeological Investigations* (OASIS) will be completed as part of the archiving phase of the project.

3. BACKGROUND

3.1 INTRODUCTION

3.1.1 A rapid examination of cartographic sources was undertaken, in order to provide supporting evidence for the phasing of the building. The results of this are summarised briefly below

3.2 LOCATION, TOPOGRAPHY AND GEOLOGY

3.2.1 The bunker is located on the south side of Whittingham Road (B5269) (SD 54965, 36175) in approximately 0.74 acres of land. The area is essentially rural and is approximately 0.7 miles west of the village of Goosnargh and 5.9 miles north of the city of Preston in Lancashire.

3.2.2 The site is underlain by a drift deposit of glacial till, consisting of a slightly sandy-clay containing cobbles and boulders, which is itself underlain by Middle Sands, comprising glacial sands and gravel. The solid geology is Carboniferous Limestone series that contains strata of mudstones, siltstones, limestones and occasional sandstones (Countryside Commission 1998).

3.3 RAPID MAP REGRESSION

3.3.1 The Ordnance Survey (1932, 1938) mapping of the 1930s depicts an undeveloped green field with deciduous and coniferous trees along the road side. To the west of the site, there are a pair of rectangular buildings, which appear to be two of the structures making up the private residence that still stands today. The rest of the area is predominantly rural with odd private residences and farms such as Whittingham House and Home Farm to the south-west.

3.4 LANGLEY LANE: HISTORY AND DEVELOPMENT

3.4.1 The following comprises a brief summation of the history of the Langley Lane complex over the last seven decades. Most of the information relates to the complex as a whole, but has been included to provide a more rounded history of the filter bunker itself. The account is a synthesis of several sources, but the majority of information was obtained from the *Subterranea Britannica* website.

3.4.2 ***Second World War:*** Langley Lane was one of four similar complexes built by the RAF during the 1940s, with the other three situated at Inverness, Kenton Bar (Newcastle upon Tyne) and Watnall (Nottinghamshire) (*Subterranea Britannica*). Each of these installations contained at least three bunkers, including operations, filter and communication facilities. This Preston-based complex served as 9 Group Operations Centre Fighter Command, with the bunker on Whittingham Lane functioning as the filter block, whilst the operations and communications facilities were situated on Langley Lane itself. The filter block was used throughout the rest of the war, and its primary

function was the collation and filtering of signals and other information, prior to dissemination.

3.4.3 ***Post-war Period:*** following the Second World War, the radar system for the UK was neglected, with the assumption that no major conflict involving Britain would occur within the next decade (*Subterranea Britannica*). However, the Soviet Union's incipient nuclear programme and later, the outbreak of the Korean War in 1950, undermined this short-sighted policy. As relations deteriorated between the East and West, it was feared that Britain's insubstantial warning system would leave her vulnerable to the Soviet fleet of TU-4 Bull bombers, which were capable of carrying 20 kT atomic bomb payloads. In light of these security concerns, the Cherry Report of 1949 recommended a rapid overhaul of British air defences, with the existing 170 radar sites being consolidated and reduced to 66 sites. This ROTOR project, as it was known, divided the UK into six zones, each of which would be controlled by a Sector Operations Centre (SOC). The Langley Lane installation became the SOC for the Western Sector of Britain (Cocroft and Thomas 2004, 103), and to this end, received minor modifications and refitting.

3.4.4 However, the site was never used as the Western Sector SOC, as a combination of factors dramatically undermined the ROTOR project in its infancy. The implementation of the 'Green Garlic' or 'Type 80' radar system, in conjunction with the development of the Soviet H-bomb and supersonic high-flying bombers by the mid 1950s meant that a new system of Master Radar Stations (MRS) was devised. This new radar system ensured that both warning and interception guidance could be controlled at the same site, whilst the superior range of the Type 80 also meant that fewer sites were required. Subsequently, many of the sites, including the SOC at Langley Lane were rendered unnecessary before they had even begun operating on a meaningful basis (*Subterranea Britannica*).

3.4.5 However, in response to the increasing nuclear threat, the government created the United Kingdom Warning and Monitoring Organisation (UKWMO), which together with the 21 Group Royal Observation Corps (ROC), occupied the building from the end of the 1950s (Cocroft and Thomas 2004, 176; McCamley 2007, 132). The latter was a civilian defence force, providing much of the personnel for the UKWMO, which made their joint occupation of the facility a sensible option. From 1975 onwards the Langley Lane complex became increasingly important to the UKWMO, being chosen first, as its Western Sector Headquarters and later as its alternate supreme headquarters (McCamley 2007, 144). The occupancy of the building continued well into the late twentieth century, until both the UKWMO and the ROC were disbanded in the early 1990s, following the end of the Cold War.

3.4.6 The filter bunker seems to have been used in a separate capacity as the Regional Armed Forces Headquarters (McCamley 2007, 134, 145) for many years, but was last occupied in 1992. Since then, the facility has been left vacant, and has passed into private ownership.

4. BUILDING INVESTIGATION RESULTS

4.1 INTRODUCTION

4.1.1 The former RAF bunker at Goosnargh is located on Whittingham Lane (B5269), 1.1m to the south-east of the main Langley Lane complex, and some 5.9m north of the city of Preston. The site is bounded on its north side by Whittingham road, with a small lane forming its eastern boundary. To the west and south, there is a private residence with stables and paddock to the rear.

4.2 THE BUNKER: EXTERNAL FEATURES

4.2.1 The exterior of the bunker is essentially a sub-rectangular mound of earth measuring approximately 4.5m high, 50m long and 34m wide (Plate 5) (Figs 2-4), which is aligned north-east/south-west, but will be assumed to follow an east-west alignment for ease of reference. The rear (south) side of the bunker is featureless, whilst at the east end there is a brick housing for the sewage and wastewater pump (Plate 4). Additionally, at the west end, there is a brick ventilation shaft, whilst further ventilation points are evident along the north elevation. The front of the building is mainly brick with reinforced concrete roofing overlaid with asphalt, whilst the projecting west and east entrances are constructed entirely from concrete (Plates 1-3).

4.2.2 At the front (north) of the building, there is a concrete and tarmac forecourt with a raised concrete plinth, which overlies a former diesel storage tank. In addition, there is the original brick electricity sub-station to the north-west of the site, which houses the transformer providing the three-phase electricity supply to the bunker.

4.2.3 Access into the building is via a pair of folding steel shutter doors situated within the concrete entrances at the east and west ends of the north elevation. Of these, the west entrance appears to have had a turnstile arrangement to control access into the bunker. A small security kiosk has been built in brick to the right of the west entrance, and this was originally accessed by a door on the north elevation, which has since been blocked with brick. Further right, there is a short section of brick wall in stretcher bond with concrete coping, which forms the retaining wall of the turnstile entrance that doglegs to the left. The turnstile itself has the maker's plate 'Le Grand, Sutcliff & Gell Ltd, London Works Southall, Makers of Norton's Turnstile', whilst the entrance itself is very narrow (Plate 6). Behind the turnstile, there is an equally narrow doorway into the entrance hall (**1**) of the bunker, but this has subsequently been blocked with brick. In addition to this pair of entrances, the generator room to the centre of the elevation has a pair of hinged steel doors that allow full access into the building.

4.2.4 The exterior of the building also originally featured a radio tower mast that stood at some 15.65m high but this has since been removed.

4.3 THE BUNKER: INTERNAL ARRANGEMENT

4.3.1 The interior of the bunker is divided into two floors (Figs 2-4), the upper ground floor and lower ground floor, with a small sub-basement. From the west entrance (the turnstile entrance is now blocked), there is a hallway with a small flight of stairs (**1**) (Plate 7) (Fig 2), and a small junction box room (**2**) to the right. Directly ahead is a doorway leading into a short corridor (**3**) (Plate 8) and a signal room on the right (**4**) (Plate 10). Just inside this doorway, there is a set of stairs on the left, which leads up to the former generator room (**33**). The south end of this corridor provides access into a large open room, apparently functioning as the armoury (**5**) (Plate 11), which in turn leads into a slightly narrower room to the west (**6**). The east side of the same corridor opens into the main east/west cross-passage (**7**). Heading east along this passage, there is a door on the right, which leads to the upper floor of the central operations room (**8a**). Directly in front of this doorway is a small flight of wooden stairs leading down to the lower floor of the operations room (**8b**), whilst a door in the southeast corner of the room provides access to the south arm of the main corridor (**7**) (Plate 13).

4.3.2 To the east of the operations room (**8a**), there is a small office (**9**) with and a pair of probable dormitories (**10** and **11**), though they are not identified as such. On the left, there is a short corridor (**12**), which is identical to (**3**), and similarly, rooms **13**, **14** and **15,** which comprise the eastern entrance and are comparable with rooms **4**, **1** and **2** respectively. It is only these two areas of the facility, which display any symmetrical design.

4.3.3 Heading south from this eastern entrance, there is a small security/reception desk on the left (**16**) (Plate 9), followed by a store room (**17**), ladies' toilets (**18**) (Plate 18), staircase to lower ground floor (**7b**), and gentlemen's toilets (**19**). Following the corridor south and round to the west, there are a further three probable dormitories (**20**, **21** and **22**) (Plate 17).

4.3.4 The lower ground floor (Fig 3) may be accessed from the concrete stairs at the intersection of corridors **3** and **7** (**7a**) (Plate 12) or those at the east end of the bunker (**7b**). Alternatively, there are also the wooden stairs within the upper floor of the operations room (**8a**) (Plates 14-16). At the base of the stairs at the west end of the corridor, there is a short section of corridor (**23a**), which provides access into two large rooms (**24** and **25**) (Plate 19), comparable with rooms **5** and **6** on the floor above. Room **24** functions as the ventilation plant room, which serves the entire facility, whilst to the east, there is an electrical switch room (**26**).

4.3.5 As on the floor above, the corridor extends the full length of the installation from east to west (**23b**) and provides access to the lower floor of the operations room (**8b**), the mess room (**27**) and the two kitchens serving it (**28a** and **c**); a small larder (**28b**) lies to the south of kitchen **28a**. At the east extent of the bunker, the corridor turns south with a ladies dormitory and adjacent toilets (**29a** and **b**), the staircase to the ground floor (**7b**) and the gentlemen's toilets (**31**), which are all situated on the left side of the corridor. On the right, there is a single large male dormitory (**30**) and a smaller dormitory to the west of this (**32**) (Plate 20), which is accessed from the south arm of the corridor.

Additionally, the mess room (**27**) and the main operations room (**8b**) may also be accessed from this south side of the facility.

4.4 THE BUNKER: INTERNAL FEATURES

4.4.1 The external walls are painted reinforced concrete, believed to be between 0.225m and 0.375m thick, whilst the internal walls are all brick, and have been plastered, painted and finished with cement-render skirtings. In some of the rooms, most notably the upper floor of the operations room (**8a**), there are compressed mineral fibre tiles lining the walls. In addition, the corridors (**7**, **23a** and **b**) have been subdivided with the insertion of cinder block doorways on the north and east extents. The base of the west stairs (**7a**) has also been remodelled with cinder block, whilst the electrical switch room (**26**) has been created with the insertion of a cinder block wall against the original south wall of corridor **23b**. Further partitions feature within rooms **5** and **6**, with the former having a hardboard partition on its north side that encloses a small room housing telecommunication boxes, whilst the latter has a plasterboard partition for a maintenance area, again at the north end.

4.4.2 The floor is concrete throughout, with the exception of the suspended timber floors within the upper and lower floors of the operations room (**8a** and **b**). The concrete floors are generally left bare as in the larger rooms such as the armoury (**5**), which also has a timber rifle-rack along the north and east walls. Some rooms are laid with vinyl, as in the kitchens and larder (**28a**, **b**, **c**), or laid with contract carpet, as in the dormitories (such as **30**-**32**). Additionally, part of the floor within the generator room (**33**) has been laid with ceramic tiles.

4.4.3 The ceilings throughout are simply reinforced concrete, with some of the larger rooms at the west end of the facility having reinforced concrete beams. In addition, the ceiling of the operations room (**8a** and **b**) has the same compressed mineral fibre tiles that line the walls, whilst all of the rooms have the conduits of the ducted supply/extract ventilation system.

4.4.4 The doors are a mixture of heavy-duty steel and timber doors, with some hinged and some sliding. Additionally, some retain their original door furniture, whilst the rest feature modern replacements. Moreover, some of the earlier/original doors have evidently been blocked or remodelled, with the door at the entrance to the signal room (**4**) being an obvious case of the latter. In addition, there is a blocked door on the shared partition wall between **3** and **5a**, which is evident from the lintel remaining in the brickwork, whilst a further blocked door is located on the wall adjacent to the entrance to room **25**. In addition, there are three blocked hatches, one of which is a small ventilation hatch or similar on the west wall of **25**. Another of these is located on the west wall of room **9** and may be a former observation window overlooking the operations room, whilst the third is a blocked aperture on the east wall of room **28c**.

4.4.5 Additionally, there are a pair of hatches between the mess room (**27**) and the adjacent kitchen (**28a**), and a further hatch between two of the dormitories on the ground floor (**21** and **22**).

4.4.6 The building still contains a substantial amount of plant, particularly in the ventilation plant room (**24**), within which, there is an electric heater bank on the right and a Vokes Air filtration system on the left, comprising mainly the supply/extraction ductwork. To the immediate east of this, there is an electrical switch room (**26**), containing the oil switch for the electrical heater generators and the main supply. On the ground floor, the generator room (**33**) has since been stripped clean, but until recently housed a Dawson Keith 125KVA, 415V three-phase and neutral diesel generator, which acted as the backup for the main power supply from the substation (Aspinwall and Company Ltd 1998).

4.4.7 No lighting was available at the time of the survey, but the LV electrical distribution system was previously conveyed around the building in MICC and PVC singles in both conduit and trunking. Whilst most of the switches had been replaced with modern plastic fittings, there were still some of the original Bakelite switches scattered throughout the building. The remains of a pneumatic capsule pipe system were also observed in both room **5** and the lower ground floor of the operations room (**8b**). Of further interest was the pair of large boards, both manufactured by Weyel in West Germany, that still stand on the east side of the operations room (**8b**). On the left was a map of the western operational sector of Britain, which consists mainly of north-west England, and on the right was a whiteboard with details of troop deployment and movements.

5. DISCUSSION

5.1 INTRODUCTION

5.1.1 The bunker was constructed in the 1940s by the RAF as part of the Langley Lane (also known as Longley Lane) complex, which acted as 9 Group Operations Centre Fighter Command. The facility served as the filter block, which involved the collecting and filtering of signals and other information, prior to their dissemination. Following the war, the building became the combined headquarters of Preston Regional Armed Forces, and may have been used as a firing range (Brian Cox pers comm).

5.2 PHASES OF DEVELOPMENT

5.2.1 ***Phase One:*** the building of the facility is clearly recorded as well as its function as the filter block for the nearby Langley Lane complex. Langley Lane was one of four similar installations purpose-built by the RAF during the 1940s, and housed operations, filter and communication facilities. It appears that the filter bunker was essentially the same shape in plan in the 1940s as the existing bunker today.

5.2.2 ***Phase Two***: according to McCamley (2007, 145), the installation has been 'much altered internally for its latter role', but there is only limited evidence to support this. Certainly, several doors and hatchways have been inserted, remodelled or moved during the post-war period, whilst it is evident that the original office space on the ground floor has since been used as dormitories. Potentially, these may have some relevance to the use of the Langley Lane installation as a ROTOR SOC or later as the base for the UKWMO and the ROC. Whilst the filter block itself is supposed to have been unaffected by their occupancy of the rest of the Langley Lane complex, the bunker's period of use as the Regional Armed Forces Headquarters is rather vaguely defined. Subsequently, it is conceivable that the UKWMO and/or the ROC occupied the filter bunker, as well as the other parts of the facility, between the late 1950s and the building's eventual use as the Headquarters for the Regional Armed Forces. Its occupancy notwithstanding, there is little to suggest a drastic change of appearance, only of function, and this required little physical alteration to the overall fabric of the building.

5.2.3 Certainly, it is clear that other small-scale alterations have been undertaken in this phase. During the mid to late twentieth century, the electrics appear to have been repaired, with many of the original Bakelite switches being replaced with modern fittings. Similarly, many of the door handles appear to have been replaced. In addition, the cinder block insertions all appear to date from this period. Thus, all of the doorways added to the corridors, the remodelling of the wall at the base of the west steps, the blocking of some of the apertures date to this phase In addition, the original generator was replaced with the Dawson Keith 125 KVA diesel generator in 1985 (Aspinwall and Co, 1998). Simultaneously, it appears that two earlier diesel tanks were removed and replaced with the present underground tank, which is known to have a capacity of 29, 060 litres (Aspinwall and Co Ltd, 1998).

5.2.4 ***Phase Three:*** by the late twentieth century, the building was apparently used as a firing range, but there is limited evidence to support this. Only the rifle racks in room **5** suggest this function, but these presumably relate to the installation's role as the combined headquarters of the Preston's Armed Forces. There was no further evidence encountered during the investigation that could support this assertion, nor has the client discovered anything relevant during his extensive time in the building or his research into its history (Brian Cox pers comm).

5.2.5 It seems that the building was vacated in 1992 and has remained unoccupied since. Subsequently, the radio mast, the remaining diesel (some 7,500 litres) in the underground fuel tank, and all of the furniture were removed in July-August 1996 (Aspinwall and Co Ltd, 1998; W S Atkins 1996, 1999).

5.3 CONCLUSION

5.3.1 Mike Osborne (2004) has noted that Britain is losing many of the twentieth century structures that have contributed so effectively to her defence. In the last two decades, the bunker has remained unused and, subsequently, has suffered from both flooding and vandalism. The probable cause of this neglect is the assumption that the building is relatively modern and constructed of concrete and, therefore, its deterioration or loss is not a matter of great concern. However, for yet another of these monuments to be lost through neglect would be undesirable. The former filter bunker is not only a testament of one aspect of the RAF's role during the Second World War and the subsequent Cold War, but it is also a fascinating building in its own right and deserves to be maintained properly.

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7. ILLUSTRATIONS

7.1 LIST OF FIGURES

7.2 LIST OF PLATES

APPENDIX 1: PROJECT DESIGN