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## **APPENDIX 3**

### **UXO RISK ASSESSMENT**

# Detailed Unexploded Ordnance (UXO) Risk Assessment

|                   |                                                        |
|-------------------|--------------------------------------------------------|
| Project Name      | Colerne Industrial Estate                              |
| Client            | Earth Environmental & Geotechnical Ltd.                |
| Site Address      | Colerne Industrial Estate, Colerne, Wiltshire SN14 8HT |
| Report Reference  | DA23079-00                                             |
| Date              | 21/01/2026                                             |
| Author            | JL                                                     |
| Quality Assurance | HW                                                     |
| Final Check       | AB                                                     |

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## 1<sup>ST</sup> LINE DEFENCE



## Executive Summary

### Site Location and Description

The site is located in Colerne, within the county of Wiltshire.

Recent aerial imagery indicates that the site occupies three hangars associated with the former RAF Colerne. Its former taxiways and open ground can also be found within the site.

It is bound to the north by taxiways and grounds of Colerne Airfield. Totts Lane and a small wooded area lie to the east, whilst another roadway, open ground, and Colerne Rugby Club are situated to the south. A perimeter road associated with the airfield and open ground adjoin the west of the site.

The site is approximately centred on the OS grid reference: **ST 81310 71424**.

### Proposed Works

Information provided by the client indicates that the demolition of existing buildings is set to take place, with 175 residential dwellings set to be erected thereafter.

### Geology and Bomb Penetration Depth

The British Geological Survey (BGS) map shows the bedrock geology of the site to be underlain by Chalfield Oolite Formation – Ooid-limestone.

No superficial deposits were recorded across the site.

Site-specific geotechnical information was not available to 1st Line Defence at the time of the production of this report. An assessment of maximum bomb penetration depth can be made once such data becomes available, or by a UXO specialist during on-site support.

It should be noted that the maximum depth that a bomb could reach may vary across a site and will be largely dependent on the specific underlying geological strata and its density.

### UXO Risk Assessment

1st Line Defence has assessed that there is an overall **Medium Risk** from items of Allied UXO at the site of proposed works. There is also an assessed **Low Risk** from German Air-Delivered UXO and Anti-Aircraft Projectiles.

#### The Risk from Allied UXO

- The site was historically located within RAF Colerne. Located on a high plateau, the airfield was first surveyed in 1936 yet construction work did not commence until 1939. Initially opened under RAF Maintenance Command in January 1940, the airfield would be handed over to Fighter Command by June 1940, before the airfield's runways were finally completed in early 1941. The station was Sector HQ for No. 10 Group Colerne with numerous operational fighter squadrons flying aircraft such as Hawker Hurricanes and Boulton Paul Defiants. De Havilland Mosquitos of No. 151 Squadron extensively used the airfield after 1943 and the airfield saw extensive activity around D-Day. Gloster Meteors of No. 616 Squadron arrived in early 1945, whilst Colerne became home to the first jet training unit, No 1335 Conversion Unit. In November 1946 RAF Colerne was transferred back to RAF Maintenance Command. It was subsequently turned over to Transport Command in 1957 who flew Handley Page Hastings and undertook servicing work. Whilst RAF Colerne closed in 1976 the site was taken on by the Army who opened Azimghur Barracks. The airfield has since been used to a limited extent.
- As a section of RAF Colerne, the eastern portion of the site occupied three Type K aircraft hangars and several taxiways. Further such features and a roadway ran through the west. Aircraft are known to have been dispersed across the site, especially in the east as shown by WWII-era aerial photography dated 1940 and 1946. The three Type K aircraft hangars would have also been used to re-equip aircraft with items of ordnance.
- Whilst no evidence could be found to suggest that the site was located within proximity to the bomb stores or armoury, it is likely that items of ordnance were present in proximity to areas where aircraft were dispersed. Indeed, much of the east of the site is suspected to have used to re-equip fighter aircraft between sorties. A database of known disposal/clearance tasks has been referred to which makes note of an EOC task at Azimghur Barracks in 1998 which recovered 'old aircraft cannon shell heads' at the 'rear wall of [the] range'. Whilst this is noted as having taken place approximately 1km north of the site, it highlights the possibility of encountering RAF related ordnance at the former RAF Colerne.

- The southern edge of the site formed the perimeter of RAF Colerne. Such areas are at an elevated risk as they were often used for ad-hoc ordnance disposal.
- Several trench shelters were located in the east of the site.<sup>1</sup> Designed to protect service personnel in the event of an enemy air raid, they would likely not have held items of LSA, albeit personnel using them may well have had items SAA on their person.
- Various aircraft are known to have crashed at RAF Colerne throughout its operational history. The station's Operations Record Books indicate that a de Havilland Mosquito crashed into one of the airfield's fighter hangars in October 1942. It is unclear which hangar was affected, and it should be noted that three fighter hangars were situated on site. Another Mosquito crashed between the airfield and Colerne village in September 1943. The site was positioned between the runways and the village. A further Mosquito came to grief at the end of Colerne's easternmost runway in January 1944, relatively close to the site. It should be noted that the exact location of the aforementioned incidents remain uncertain.
- In summary, the site was located within RAF Colerne, a fighter airfield that saw active use throughout the war as well as during the Cold War under Transport Command. During its usage, the site held three Type K aircraft hangars, an area where aircraft were re-equipped with ordnance between sorties. Indeed, aircraft were dispersed more widely across the site. These factors potentially increase the risk of UXO contamination occurring on/in the vicinity of the site in addition to the potential for aircraft crashes and ad-hoc ordnance disposal in proximity to the airfield's perimeter.
- Overall, given the site's history and location, the risk of contamination from buried, lost/discarded Allied UXO cannot be discounted. As such, the site has been assessed as holding an overall **Medium Risk** from Allied UXO contamination. It is recommended that **open excavation works are supported by a UXO Specialist** as a precaution and that **UXO Safety and Awareness Briefings** are provided to all ground personnel. In any undeveloped areas of the site, it may be possible to carry out a **non-intrusive magnetometer survey** and **target investigation**.

#### The Risk from German Air-Delivered UXO

- During WWII the site was situated within the Calne and Chippenham Rural District. According to official Home Office bombing statistics this district sustained a very low density of bombing with 197 items of ordnance recorded across the 86,034 acre district, or an average of 2.3 items per 1,000 acres.
- South-West Civil Defence Daily Summaries and RAF Colerne's Operational Record Book indicate that the airfield was directly impacted by bombing on at least three occasions. On 10th April 1941 two 50kg HE Bombs struck the north of the aerodrome, between the main and temporary landing grounds. Thereafter, on 3rd May 1941 two unexploded bombs fell about 200 yards from the south-west corner of the aerodrome. Falling some 1km south-west of the site, the exact position of the unexploded bombs and exactly how they were dealt with is not known. Another incident occurred on 25th April 1942 when Nissen huts within the airfield were damaged by a stick of bombs that fell between Hunter's Hall and the Rocks, some 1.5km south-west of the site. It should be noted that South-West Civil Defence Daily Summaries note further incidents within the civil parish of Colerne but does not provide exact locations. Therefore, it is quite possible that other bombing incidents occurred in closer proximity to the site than those described above.
- WWII-era aerial photography, dated 1940 and 1946, does not provide any obvious evidence of wartime-era damage. Rubble and debris would be indicative of such attacks across the developed areas of the site, whilst cratering, disturbed ground, and scattered earth would be applicable to open areas. RAF Colerne's Operations Record Book notes that a Nissen hut's corrugated sheeting was damaged by the stick of bombs that fell on 25th April 1942. The exact location of the hut is unknown, but it may have been in the south-west corner of the aerodrome, at least 1km south-west of the site.
- The nature of groundcover across the vast majority of the site is anticipated to have been largely conducive toward particularly the detection of UXO throughout the war. This is because in developed areas with aircraft hangars and taxiways, UXBs would have left a highly visible trail of rubble and debris. This reduces the likelihood of UXO going missing and unreported.
- Given that the site occupied aircraft hangars and taxiways within an active RAF station, access would have been frequent with aircraft being dispersed across this area. A good degree of coverage reduces the likelihood of UXO going missing and unreported.
- In summary, no positive evidence could be found to suggest that the site was directly bombed during WWII. Whilst three incidents are recorded at RAF Colerne, none are thought to have affected the site. Aerial imagery from 1940 and 1946 shows no obvious indicators of bombing or damage on or adjacent to the site. Indeed the site would have benefitted from increased access levels being within an active RAF station. This would have significantly reduced the likelihood of UXO going missing and unreported. As a result of the above factors the site has been assessed to be at an overall **Low Risk** from German air-delivered UXO.

<sup>1</sup> [https://www.heritagegateway.org.uk/Gateway/Results\\_Single.aspx?uid=MW177979&resourceID=1047](https://www.heritagegateway.org.uk/Gateway/Results_Single.aspx?uid=MW177979&resourceID=1047)

**Post-WWII Redevelopment**

- Limited development has taken place on site since WWII. The three K Type aircraft hangars remain on site in addition to hardstanding and taxiways.
- The risk of UXO remaining is considered to be mitigated at the location of and down to the depth of any post-war redevelopment on site. For example, the risk from deep buried UXO will only have been mitigated within the volumes of any post-war pile foundations or deep excavations for basement levels. The risk will however remain within virgin geology below and amongst these post-war works, down to the maximum bomb penetration depth.

**Recommended Risk Mitigation Measures**

The following risk mitigation measures are recommended to support the proposed works at Colerne Industrial Estate:

| Activity                                                                                                                                                                                                    | Recommended Risk Mitigation Measure                                                                                                                                                                                                                                                                                                     |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| All Works                                                                                                                                                                                                   | <ul style="list-style-type: none"> <li>• UXO Risk Management Plan</li> <li>• Site Specific UXO Awareness Briefings to all personnel conducting intrusive works.</li> </ul>                                                                                                                                                              |
| Open Excavations<br>(trial pits, service pits, bulk excavations, strip foundations etc.)                                                                                                                    | <ul style="list-style-type: none"> <li>• Non-Intrusive UXO Magnetometer Survey and Target Investigation.<br/><i>Where this type of survey is not practical (due to for example terrain or ground conditions), the following is recommended to support shallow intrusive works:</i></li> <li>• UXO Specialist On-site Support</li> </ul> |
| <i>Note – proactive on-site UXO support/survey should not be necessary for any works taking place at the location of and down to the depths of significantly worked post-war made ground/post-war fill.</i> |                                                                                                                                                                                                                                                                                                                                         |

## Glossary

| Abbreviation | Definition                                                  |
|--------------|-------------------------------------------------------------|
| AA           | Anti-Aircraft                                               |
| AFS          | Auxiliary Fire Service                                      |
| AP           | Anti-Personnel                                              |
| ARP          | Air Raid Precautions                                        |
| DA           | Delay-action                                                |
| EOC          | Explosive Ordnance Clearance                                |
| EOD          | Explosive Ordnance Disposal                                 |
| FAA          | Fleet Air Arm                                               |
| FP           | Fire Pot                                                    |
| GM           | G Mine (Parachute mine)                                     |
| HAA          | Heavy Anti-Aircraft                                         |
| HE           | High Explosive                                              |
| IB           | Incendiary Bomb                                             |
| JSEODOC      | Joint Services Explosive Ordnance Disposal Operation Centre |
| LAA          | Light Anti-Aircraft                                         |
| LCC          | London County Council                                       |
| LRRB         | Long Range Rocket Bomb (V-2)                                |
| LSA          | Land Service Ammunition                                     |
| NFF          | National Filling Factory                                    |
| OB           | Oil Bomb                                                    |
| PAC          | Pilotless Aircraft (V-1)                                    |
| PB           | Phosphorous Bomb                                            |
| PM           | Parachute Mine                                              |
| POW          | Prisoner Of War                                             |
| RAF          | Royal Air Force                                             |
| RCAF         | Royal Canadian Air Force                                    |
| RFC          | Royal Flying Corps                                          |
| RNAS         | Royal Naval Air Service                                     |
| ROF          | Royal Ordnance Factory                                      |
| SA           | Small Arms                                                  |
| SAA          | Small Arms Ammunition                                       |
| SD2          | Anti-personnel "Butterfly Bomb"                             |
| SIP          | Self-Igniting Phosphorous                                   |
| U/C          | Unclassified bomb                                           |
| UP           | Unrotated Projectile (rocket)                               |
| USAAF        | United States Army Air Force                                |
| UX           | Unexploded                                                  |
| UXAA         | Unexploded Anti-Aircraft                                    |
| UXB          | Unexploded Bomb                                             |
| UXO          | Unexploded Ordnance                                         |
| V-1          | Flying Bomb (Doodlebug)                                     |
| V-2          | Long Range Rocket                                           |
| WAAF         | Women's Auxiliary Air Force                                 |
| X            | Exploded                                                    |

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# 1<sup>st</sup> Line Defence Limited®

## Detailed Unexploded Ordnance (UXO) Risk Assessment

Site: Colerne Industrial Estate  
Client: Earth Environmental & Geotechnical Ltd.

### 1. Introduction

#### 1.1. Background

1st Line Defence has been commissioned by Earth Environmental & Geotechnical Ltd. to conduct a Detailed Unexploded Ordnance (UXO) Risk Assessment for the works proposed at Colerne Industrial Estate.

Buried UXO can present a significant risk to construction works and development projects. The discovery of a suspect device during works can cause considerable disruption to operations as well as cause unwanted delays and expense.

UXO in the UK can originate from three principal sources:

1. Munitions resulting from wartime activities including German bombing in WWI and WWII, long range shelling, and defensive activities.
2. Munitions deposited as a result of military training and exercises.
3. Munitions lost, burnt, buried or otherwise discarded either deliberately, accidentally, or ineffectively.

This report will assess the potential factors that may contribute to the risk of UXO contamination. If an elevated risk is identified at the site, this report will recommend appropriate mitigation measures, in order to reduce the risk to as low as is reasonably practicable. Detailed analysis and evidence will be provided to ensure an understanding of the basis for the assessed risk level and any recommendations.

This report complies with the guidelines outlined in CIRIA C681, 'Unexploded Ordnance (UXO) A Guide for the Construction Industry.'

## **2. Method Statement**

### **2.1. Report Objectives**

The aim of this report is to conduct a comprehensive assessment of the potential risk from UXO at Colerne Industrial Estate. The report will also recommend appropriate site and work-specific risk mitigation measures to reduce the risk from explosive ordnance during the envisaged works to a level that is as low as reasonably practicable.

### **2.2. Risk Assessment Process**

1st Line Defence has undertaken a five-step process for assessing the risk of UXO contamination:

1. The likelihood that the site was contaminated with UXO.
2. The likelihood that UXO remains on the site.
3. The likelihood that UXO may be encountered during the proposed works.
4. The likelihood that UXO may be initiated.
5. The consequences of initiating or encountering UXO.

In order to address the above, 1st Line Defence has taken into consideration the following factors:

- Evidence of WWI and WWII German air delivered bombing as well as the legacy of Allied occupation.
- The nature and conditions of the site during WWII.
- The extent of post-war development and UXO clearance operations on site.
- The scope and nature of the proposed works and the maximum assessed bomb penetration depth.
- The nature of ordnance that may have contaminated the proposed site area.

### **2.3. Sources of Information**

Every reasonable effort has been made to ensure that relevant evidence has been consulted and presented in order to produce a thorough and comprehensible report for the client. To achieve this the following, which includes military records and archive material held in the public domain, have been accessed:

- The National Archives and Wiltshire and Swindon History Centre.
- RAF site plans obtained from the RAF Museum, Hendon.
- Historical mapping datasets.
- Historic England National Monuments Record.
- Relevant information supplied by Earth Environmental & Geotechnical Ltd.
- Available material from 33 Engineer Regiment (EOD) Archive (part of 29 Explosive Ordnance and Disposal and Search Group).
- 1st Line Defence's extensive historical archives, library and UXO geo-datasets.
- Open sources such as published books and internet resources.

### **3. Background to Bombing Records**

#### **3.1. General Considerations of Historical Research**

This desktop assessment is based largely upon analysis of historical evidence. Every reasonable effort has been made to locate and present significant and pertinent information. 1st Line Defence cannot be held accountable for any changes to the assessed risk level or risk mitigation measures, based on documentation or other data that may come to light at a later date, or which was not available to 1st Line Defence during the production of this report.

It is often problematic and sometimes impossible to verify the completeness and accuracy of WWII-era records. As a consequence, conclusions as to the exact location and nature of a UXO risk can rarely be quantified and are, to a degree, subjective. To counter this, a range of sources have been consulted, presented and analysed. The same methodology is applied to each report during the risk assessment process. 1st Line Defence cannot be held responsible for any inaccuracies or the incompleteness in available historical information.

#### **3.2. German Bombing Records**

During WWII, bombing records were generally gathered locally by the police, Air Raid Precaution (ARP) wardens and military personnel. These records typically contained information such as the date, the location, the amount of damage caused and the types of bombs that had fallen during an air raid. This information was made either through direct observation or post-raid surveys. The Ministry of Home Security Bomb Census Organisation would then receive this information, which was plotted onto maps, charts, and tracing sheets by regional technical officers. The collective record set (regional bomb census mapping and locally gathered incidents records) would then be processed and summarised into reports by the Ministry of Home Security Research and Experiments Branch. The latter were tasked with providing the government 'a complete picture of air raid patterns, types of weapons used and damage caused- in particular to strategic services and installations such as railways, shipyards, factories and public utilities.'

The quality, detail and nature of record keeping could vary considerably between provincial towns, boroughs and cities. No two areas identically collated or recorded data. While some local authorities maintained records with a methodical approach, sources in certain areas can be considerably more vague, dispersed, and narrower in scope. In addition, the immediate priority was mostly focused on assisting casualties and minimising damage at the time. As a result, some records can be incomplete and contradictory. Furthermore, many records were even damaged or destroyed in subsequent air raids. Records of raids that took place on sparsely or uninhabited areas were often based upon third party or hearsay information and are therefore not always reliable. Whereas records of attacks on military or strategic targets were often maintained separately and have not always survived.

#### **3.3. Allied Records**

During WWII, considerable areas of land were requisitioned by the War Office for the purpose of defence, training, munitions production and the construction of airfields. Records relating to military features vary and some may remain censored. Within urban environments datasets will be consulted detailing the location of munition production as well as wartime air and land defences. In rural locations it may be possible to obtain plans of military establishments, such as airfields, as well as training logs, record books, plans and personal memoirs. As with bombing records, every reasonable effort will be made to access records of, and ascertain any evidence of, military land use. However, there are occasions where such evidence is not available, as records may not be accessible, have been lost/destroyed, or simply were not kept in the first place.

## **4. UK Regulatory Environment and Guidelines**

### **4.1. General**

There is no formal obligation requiring a UXO risk assessment to be undertaken for construction projects in the UK, nor is there any specific legislation stipulating the management or mitigation of UXO risk. However, it is implicit in the legislation outlined below that those responsible for intrusive works (archaeology, site investigation, drilling, piling, excavation etc.) should undertake a comprehensive and robust assessment of the potential risks to employees and that mitigation measures are implemented to address any identified hazards.

### **4.2. CDM Regulations 2015**

The Construction (Design and Management) Regulations 2015 (CDM 2015) define the responsibilities of parties involved in the construction of temporary or permanent structures.

The CDM 2015 establishes a duty of care extending from clients, principle designers, and contractors to those working on, or affected by, a project. Those responsible for construction projects may therefore be accountable for the personal or proprietary loss of third parties, if correct health and safety procedure has not been applied.

Although the CDM does not specifically reference UXO, the risk presented by such items is both within the scope and purpose of the legislation. It is therefore implied that there is an obligation for parties to:

- Provide an appropriate assessment of potential UXO risks at the site (or ensure such an assessment is completed by others).
- Put in place appropriate risk mitigation measures if necessary.
- Supply all parties with information relevant to the risks presented by the project.
- Ensure the preparation of a suitably robust emergency response plan.

### **4.3. The 1974 Health and Safety at Work etc. Act**

All employers have a responsibility under the Health and Safety at Work etc. Act 1974 and the Management of Health and Safety at Work Regulations 1999, to ensure the health and safety of their employees and third parties, so far as is reasonably practicable and conduct suitable and sufficient risk assessments.

### **4.4. CIRIA C681**

In 2009, the Construction Industry Research and Information Association (CIRIA) produced a guide to the risk posed by UXO to the UK construction industry (CIRIA C681). CIRIA is a neutral, independent and not-for-profit body, linking organisations with common interests and facilitating a range of collaborative activities that help improve the industry.

The publication provides the UK construction industry with a defined process for the management of risks associated with UXO from WWI and WWII air bombardment. It is also broadly applicable to the risks from other forms of UXO that might be encountered. It focuses on construction professionals' needs, particularly if there is a suspected item of UXO on site, and covers issues such as what to expect from a UXO specialist. The guidance also helps clients to fulfil their legal duty under CDM 2015 to provide designers and contractors with project specific health and safety information needed to identify hazards and risks associated with the design and construction work. This report conforms to this CIRIA guidance and to the various recommendations for good practice referenced therein. It is recommended that this document is acquired and studied where possible to allow a better understanding of the background to both the risk assessment process and the UXO issue in the UK in general.

### **4.5. Additional Legislation**

In the event of a casualty resulting from the failure of an employer/client to address the risks relating to UXO, the organisation may be criminally liable under the Corporate Manslaughter and Corporate Homicide Act 2007.

## **5. The Role of Commercial UXO Contractors and The Authorities**

### **5.1. Commercial UXO Specialists**

The role of a UXO Specialist (often referred to as UXO Consultant or UXO Contractor) such as 1st Line Defence, is defined in CIRIA C681 as the provision of expert knowledge and guidance to the client on the most appropriate and cost-effective approach to UXO risk management at a site.

The principal role of UXO Specialists is to provide the client with an appropriate assessment of the risk posed by UXO for a specific project, and identify and carry out suitable methodology for the mitigation of any identified risks to reduce them to an acceptable level.

The requirement for a UXO Specialist should ideally be identified in the initial stages of a project, and it is recommended that this occur prior to the start of any detailed design. This will enable the client to budget for expenditure that may be required to address the risks from UXO, and may enable the project team to identify appropriate techniques to eliminate or reduce potential risks through considered design, without the need for UXO specific mitigation measures. The UXO Specialist should have suitable qualifications, levels of competency and insurances.

Please note 1st Line Defence has the capability to provide a complete range of required UXO risk mitigation services, in order to reduce a risk to as low as reasonably practicable. This can involve the provision of both ground investigation, and where appropriate, UXO clearance services.

### **5.2. The Authorities**

The police have a responsibility to co-ordinate the emergency services in the event of an ordnance-related incident at a construction site. Upon inspection they may impose a safety cordon, order an evacuation, and call the military authorities Joint Services Explosive Ordnance Disposal Operation Centre (JSEODOC) to arrange for investigation and/or disposal. Within the Metropolitan Police Operational Area, SO15 EOD will be tasked to any discovery of suspected UXO. The request for Explosive Officer (Expo) support is well understood and practiced by all Metropolitan Boroughs. The requirement for any additional assets will then be coordinated by the Expo if required.

In the absence of a UXO specialist, police officers will usually employ such precautionary safety measures, thereby causing works to cease, and possibly requiring the evacuation of neighbouring businesses and properties.

The priority given to the police request will depend on the EOD teams' judgement of the nature of the UXO risk, the location, people and assets at risk, as well as the availability of resources. The speed of response varies; authorities may respond immediately or in some cases it may take several days for the item of ordnance to be dealt with. Depending on the on-site risk assessment the item of ordnance may be removed from the site and/or destroyed by a controlled explosion.

Following the removal of an item of UXO, the military authorities will only undertake further investigations or clearances in high-risk situations. If there are regular UXO finds on a site the JSEODOC may not treat each occurrence as an emergency and will recommend the construction company puts in place alternative procedures, such as the appointment of a commercial contractor to manage the situation.

## **6. The Site**

### **6.1. Site Location**

The site is located in Colerne, within the county of Wiltshire.

It is bound to the north by taxiways and grounds of Colerne Airfield. Totts Lane and a small wooded area lie to the east, whilst another roadway, open ground, and Colerne Rugby Club are situated to the south. A perimeter road associated with the airfield and open ground adjoin the west of the site.

The site is approximately centred on the OS grid reference: **ST 81310 71424**.

Site location maps are presented in **Annex A**.

### **6.2. Site Description**

Recent aerial imagery indicates that the site occupies three former hangars associated with the former RAF Colerne. Former taxiways and open ground can also be found within the site.

A recent aerial photograph and site plan are presented in **Annex B** and **Annex C** respectively.

## **7. Scope of the Proposed Works**

### **7.1. General**

Information provided by the client indicates that the demolition of existing buildings is set to take place, with 175 residential dwellings set to be erected thereafter.

## **8. Ground Conditions**

### **8.1. General Geology**

The British Geological Survey (BGS) map shows the bedrock geology of the site to be underlain by Chalfield Oolite Formation – Ooid-limestone.

No superficial deposits were recorded across the site.

### **8.2. Site-Specific Geology**

Site-specific geotechnical data was not provided by the client during the production of this report.

## 9. Site History

### 9.1. Introduction

The purpose of this section is to identify the composition of the site pre and post-WWII. It is important to establish the historical use of the site, as this may indicate the site's relation to potential sources of UXO as well as help with determining factors such as the land use, groundcover, likely frequency of access and signs of bomb damage.

### 9.2. Historical Summary of RAF Colerne

Located on a high plateau, RAF Colerne was first surveyed in 1936 yet construction work did not commence until 1939. Initially opened under RAF Maintenance Command in January 1940, the airfield would be handed over to Fighter Command by June 1940, before the airfield's runways were finally completed in early 1941.

RAF Colerne was Sector HQ for No. 10 Group Colerne with numerous operational fighter squadrons flying aircraft such as Hawker Hurricanes and Boulton Paul Defiants. De Havilland Mosquitos of No. 151 Squadron extensively used the airfield after 1943 and the airfield saw extensive activity around D-Day. Gloster Meteors of No. 616 Squadron arrived in early 1945, whilst Colerne became home to the first jet training unit, No 1335 Conversion Unit.

In November 1946 RAF Colerne was transferred back to RAF Maintenance Command. It was subsequently turned over to Transport Command in 1957 who flew Handley Page Hastings and undertook servicing work. Whilst RAF Colerne closed in 1976 the site was taken on by the Army who opened Azimghur Barracks. The airfield has since been used to a limited extent.

### 9.3. Ordnance Survey Historical Maps

Historical maps were obtained for this report and are presented in **Annex D**. These maps provide an indication of the composition of the site pre and post- WWII. See below for a summary of the site on various mapping editions. Later sections of the report present and detail other available mapping, plans and photography and should be read in conjunction with this section as often civilian OS mapping does not show many of the historic features of some military airfields.

| Pre-WWII – Annex D1 |          |                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|---------------------|----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Date                | Scale    | Description                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 1923                | 1:10,560 | <p>The site is shown to predominantly occupy several open fields, likely agricultural in nature. A <i>Footpath (FP)</i> intersects the west of the site.</p> <p>A roadway and further open fields adjoin the north of the site, whilst <i>Totts Lane</i> runs immediately to the east beyond which can be found fields and a <i>Quarry</i>. Fields and the <i>Footpath (FP)</i> continue to the south. The roadway continues to the west.</p> |

| Post-WWII – Annex D2 |         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|----------------------|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Date                 | Scale   | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| 1974                 | 1:1,250 | <p>Significant development has taken place on site as part of <i>Colerne Airfield</i>. Three large hangars dominate the east of the site where a <i>Tank</i>, <i>Sewage Tank</i>, and <i>Electricity Substation (EI Sub Sta)</i> can also be found. Taxiways can also be found in the north and west of the site.</p> <p>Significant residential development has occurred to the south in the village of <i>Colerne</i>, whilst structures and features of <i>Colerne Airfield</i> now appear to the north.</p> <p><i>WWII era airfield plans will generally be censored, appearing as blank fields or as whited out areas. Censorship often extends into the post-war era if the airfield remained in RAF or US control.</i></p> |

## 10. Introduction to Allied Ordnance

### 10.1. General

Whilst airfields often have individual characteristics in terms of their usage, purpose and history, most military airfields utilise Allied ordnance as part of their daily operation. Typically, this ordnance can include SAA, LSA or larger air-dropped bombs, which are stored in designated areas within the station including bomb or pyrotechnic stores. Typical activities and uses that may have led to a legacy of UXO contamination at a military airfield within the UK include weapons training and firing ranges, defence exercises, weapon transport and storage areas and anti-aircraft emplacements, as well as WWII-era demolition charges and Home Guard positions.

### 10.2. Aircraft Munitions

The table below depicts a selection of typical aircraft ordnance. It should be noted that the range is representative of the weaponry most commonly fitted to/carried by military aircraft, and further types of weaponry may have been present at the airfield. For more examples of British air delivered ordnance, see **Appendices i-ii**.

| Typical Aircraft Munitions                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|-------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Item                                            | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Machine Guns/Small arms</b>                  | Most military aircraft, including fighter, bomber and helicopter transporter aircraft are equipped with light armaments that employ small arms ammunition. These are typically either machine guns or light cannons, although some larger calibre guns have historically been fitted to aircraft designed specialist roles. Military aircrews are sometimes issued with a sidearm and signal flares for defence and survival should they be shot down or forced to bail out.  |
| <b>Cannon Rounds</b>                            | Cannons are typically 20-40mm automatic guns that fire filled projectiles, usually HE, Incendiary or a mixture of the two. Cannons provide aircraft with better offensive capability, and are standard equipment for most modern aircraft. Historically, cannons were fitted to aircraft designed for a specialist role, such as ground attack aircraft or fighter interceptors.                                                                                              |
| <b>General Purpose/Medium Capacity HE Bombs</b> | General purpose HE bombs of various calibres have been the mainstay armament of military aircraft since the First World War. They are fuzed explosive bombs designed to destroy targets with a large blast. General purpose bombs are used for attacking ground targets and depending on the aircraft, large quantities of these can be carried. They were extensively used during WWII, and are still in service within many countries, alongside guided bombs and missiles. |
| <b>Heavy Bombs</b>                              | In addition to general purpose HE bombs, aircraft are sometimes capable of carrying especially large bombs designed for specialist roles or certain targets. During WWII the RAF developed a number of specialist 'earthquake bombs' designed to crack heavy fortifications. Modern equivalents of these bombs are also in service with some countries, designed for similar roles.                                                                                           |
| <b>Incendiary Bombs</b>                         | Incendiary bombs are also a mainstay of many military aircraft. They are typically smaller, filled with incendiary chemicals and are usually dropped against targets in quantity. Larger incendiary bombs are also sometimes employed, sometimes as area affect weapons against personnel.                                                                                                                                                                                    |

### 10.3. Practice Bombs

Practice bombing is often undertaken by US and RAF aircraft, and has been part of crew training since WWI. Aircrews would load their aircraft with smaller practice bombs, which would often be fitted with a smoke or flash element to mark the position of each bomb. These are then dropped on a ground and sea targets to test accuracy, often under combat conditions. Practice bombing is intended to train pilots and bombardiers, and is often supplemented by live bombing practice at dedicated ranges.

It is possible that practice bombing was undertaken at RAF Colerne. Practice bombing may have taken place at locations under the control of Fighter Command and could even include the landing grounds of RAF stations, which were sometimes used as makeshift target areas during the early stages of WWII; prior to the establishment of dedicated inland ranges. Dedicated records concerning incidents of practice bombing are however rare. Examples of British practice bombs can be found in **Appendices iii-iv**.

### 10.4. Land Service Ammunition

Land Service Ammunition (LSA) is commonly stored and utilised at most RAF Stations and is used during activities such as defensive exercises and weapons training practice. LSA covers items of ordnance that are propelled, placed, or thrown during land warfare. These items may be filled or charged with explosives, smoke, incendiary, or pyrotechnics and can be divided into five main groups:

| Land Service Ammunition (LSA) |                                                                                                                                                                                                                                                                                                                                                                                                                    |
|-------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Item                          | Description                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Mortar Rounds</b>          | A mortar round is normally nosed-fused and fitted with its own propelling charge. Its flight is stabilised by the use of a fin. They are usually tear-drop shaped (though older variants are parallel sided), with a finned 'spigot tube' screwed or welded to the rear end of the body which houses the propellant charge. Mortars are either High Explosive or Carrier (i.e. smoke, incendiary, or pyrotechnic). |
| <b>Grenades</b>               | A grenade is a short range weapon designed to kill or injure people. It can be hand thrown or fired from a rifle or a grenade launcher. Grenades either contain high explosive or smoke producing pyrotechnic compounds. The common variants have a classic 'pineapple' shape.                                                                                                                                     |
| <b>Projectiles</b>            | A projectile (or shell) is propelled by force, normally from a gun, and continues in motion using its kinetic energy. The gun a projectile is fired from usually determines its size. A projectile contains a fuzing mechanism and a filling. Projectiles can be high explosive, carrier or Shot (a solid projectile).                                                                                             |
| <b>Rockets</b>                | Rockets were commonly designed to destroy heavily armoured military vehicles (anti-tank weapon). The device contains an explosive head (warhead) that can be accelerated using internal propellants to an intended target. Anti-aircraft rocket batteries were also utilised as part of air defence measures.                                                                                                      |
| <b>Landmines</b>              | A landmine is designed to be laid on or just below the ground to be exploded by the proximity or contact of a person or vehicle. Landmines were often placed in defensive areas of the UK to obstruct potential invading adversaries. Landmines were often placed at airfields during WWII, most commonly in the form of pipemines, known as McNaughton tubes, for anti-invasion area denial.                      |

Images of the most commonly found items of LSA are presented in **Appendices v - vii**.

## 10.5. Small Arms Ammunition

Small Arms Ammunition (SAA) refers to the complete round or cartridge designed to be discharged from varying sized hand-held weapons such as rifles, machine guns and pistols. SAA can include bullets, cartridge cases and primers/caps. Example imagery of SAA are presented in **Appendix viii**.

Military airfields often have SAA present from a variety of different sources. In both WWI and WWII, the primary armament of military aircraft was a machinegun or cannon. These came in various forms, including guns fixed within the wings, nose, and also flexible mounts and turrets, which were operated manually by aircrew. Prior to the 1950s, airfields were also often defended by AA machineguns and cannons, and often a purpose-built SAA range was present within an airfield for marksmanship practice or testing aircraft armaments.

Following the end of WWII and the advancement of technology in the post-war period, machineguns were no longer an effective AA defence. However, it should be noted that small-arms may have been retained for marksmanship practice at dedicated ranges.

## 10.6. Anti-Aircraft Artillery (AAA)

It is not uncommon for military airbases to maintain their own anti-aircraft defences. Most notably during WWII when RAF stations were targeted by the Luftwaffe and active anti-aircraft defences, including both projectile gun sites and machine gun posts, were regularly employed in the defence of airbases.

During WWII three main types of gun sites existed: heavy anti-aircraft (HAA), light anti-aircraft (LAA) and 'Z' batteries (ZAA). If the projectiles and rockets fired from these guns failed to explode or strike an aircraft they would descend back to land. The table below provides further information on the operation and ordnance associated with these type of weapons.

| Anti-Aircraft Artillery              |                                                                                                                                                                                                                                                                                                                                                                                                                                               |         |              |                  |
|--------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|--------------|------------------|
| Item                                 | Description                                                                                                                                                                                                                                                                                                                                                                                                                                   |         |              |                  |
| HAA                                  | These large calibre guns such as the 3.7" QF (Quick Firing) were used to engage high flying enemy bombers. They often fired large HE projectiles, which were usually initiated by integral fuzes, triggered by impact, area, time delay or a combination of aforementioned mechanisms.                                                                                                                                                        |         |              |                  |
| LAA                                  | These mobile guns were intended to engage fast, low flying aircraft. They were typically rotated between locations on the perimeters of towns and strategically important industrial works. As they could be moved to new positions with relative ease when required, records of their locations are limited. The most numerous of these were the 40mm Bofors gun which could fire up to 120 x 40mm HE projectiles per minute to over 1,800m. |         |              |                  |
| Variations in HAA and LAA Ammunition | Gun type                                                                                                                                                                                                                                                                                                                                                                                                                                      | Calibre | Shell Weight | Shell Dimensions |
|                                      | 3.0 Inch                                                                                                                                                                                                                                                                                                                                                                                                                                      | 76mm    | 7.3kg        | 76mm x 356mm     |
|                                      | 3.7 Inch                                                                                                                                                                                                                                                                                                                                                                                                                                      | 94mm    | 12.7kg       | 94mm x 438mm     |
|                                      | 4.5 Inch                                                                                                                                                                                                                                                                                                                                                                                                                                      | 114mm   | 24.7kg       | 114mm x 578mm    |
|                                      | 40mm                                                                                                                                                                                                                                                                                                                                                                                                                                          | 40mm    | 0.9kg        | 40mm x 311mm     |
| Z-AA                                 | Rockets were commonly designed to destroy heavily armoured military vehicles (anti-tank weapon). The device contains an explosive head (warhead) that can be accelerated using internal propellants to an intended target. Anti-aircraft rocket batteries were also utilised as part of air defence measures.                                                                                                                                 |         |              |                  |

Illustrations of Anti-Aircraft artillery, projectiles and rockets are presented at **Appendix ix**.

## **11. The Likelihood of Contamination from Allied Ordnance**

### **11.1. Introduction**

When undertaking construction work within or immediately adjacent to a site with previous and/or current military use, it is often considered likely to contain an elevated risk of contamination from Allied UXO. This assumption of risk is based on the following reasoning:

- The clearance of ordnance from military camps, depots, storage facilities, ranges and training areas were not always effectively managed, or undertaken to equivalent degrees of certainty. In addition, search and detection equipment used over seventy years following WWII has proved ineffective both for certain types of UXO and at depths beyond capability.
- In the vast majority of cases, explosive ordnance would have been stored and available for use at military installations. Ordnance ranged from small arms and land service ammunition to weapons components and larger, air delivered items. During periods of heightened activity, ordnance was also frequently lost in transit, particularly between stores and assigned training locations.
- The military generally did not anticipate that their land would be later sold for civilian development, and consequently appropriate ordnance disposal procedure was not always adhered to. It was not uncommon for excess or unwanted ordnance to be buried or burnt within the perimeters of a military establishment as a means of disposal. Records of such practice were rarely kept.

There are several factors that may serve to either affirm, increase, or decrease the level of risk within an airfield. Such factors are typically dependent upon the proximity of the proposed area of works to a number of airfield features. The risk from Allied ordnance may also relate to the function of the airfield, the presence of any military training activities and any aviation incidents recorded within, or proximate to an airfield.

This section will examine the history of the airfield and assess to what degree, if any, the site could have become contaminated as a result of the historic/current military use of the surrounding area.

### **11.2. Operational Usage of RAF Colerne**

#### **11.2.1. RAF Colerne Opening and Early Usage**

Located on a high plateau, RAF Colerne was first surveyed in 1936 yet construction work did not commence until 1939. Initially opened under RAF Maintenance Command in January 1940, the airfield would be handed over to Fighter Command by October 1940, before the airfield's runways were finally completed in early 1941.<sup>2</sup>

#### **11.2.2. RAF Colerne During WWII**

Following its takeover by Fighter Command in October 1940, it became a Sector HQ for No. 10 Group. It played a significant role in night defence, with Hawker Hurricanes flying from the airfield. By April 1941 Bristol Beaufighters and Bristol Blenheims of No. 600 Squadron had arrived to compliment the night fighting role at Colerne. This was further enforced in June 1941 when No. 125 Squadron formed with its Boulton Paul Defiants. There was a brief American presence at Colerne in September 1942 when P-38 Lightnings of 27<sup>th</sup> Fighter Squadron of the 1<sup>st</sup> Fighter Group, USAAF arrived. This was associated with the North African campaign and Operation Torch. RAF Colerne's night fighting role reduced throughout 1943 as it took up an increasingly offensive role. As Operation Overlord unfolded in June 1944 several squadrons present were tasked with preventing Luftwaffe interference with the landings. In January 1945 Gloster Meteor jet fighters of No. 616 Squadron arrived and stayed for a brief period.

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<sup>2</sup> Ken Delve, *The Military Airfields of Britain: South-Western England* (Marlborough: Crowood Press, 2006), p. 73.

### 11.2.3. RAF Colerne in the Post-war Period

Gloster Meteors continued to fly from RAF Colerne following the end of WWII before the station was handed back to Maintenance Command in November 1946. During this period a gliding school and several communications flights were present. Fighter Command retook control of Colerne in May 1952, albeit it primarily performed a training role. In January 1957 Transport Command took authority of the airfield with Handley Page Hastings of No. 24 Squadron arriving. These operated worldwide, however their presence at Colerne began to decrease from 1967. RAF Colerne formally closed in March 1976. The site was taken over by the Army who opened Azimghur Barracks. The airfield continued to see limited use by No. 2 Air Experience Flight and the Bristol University Air Squadron.

Imagery detailing RAF Colerne's operational usage are presented in **Annex E**.

### 11.3. RAF Colerne Air Ministry Site and Station Defence Plan, 1953

A 1953 plan of RAF Colerne was obtained. The plan identifies the buildings of the airfield and explains what they were used for. It is also overlaid by a series of notices about how the station would be defended in the event of attack. The site plan for the airfield is presented in **Annex F**.

| RAF Colerne Air Ministry Site and Station Defence Plan – Annex F |                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Date                                                             | Comments                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| 1953                                                             | <p>This plan shows that much of the site occupies three extensive Type K aircraft hangars possibly associated with No.1 Site. The west of the site appears to form the perimeter of the airfield, whilst several taxiways look to run across the site.</p> <p>No defensive features appear to be marked within the site boundary, albeit there is no guarantee that the map is comprehensive or in-keeping with WWII-era defence measures.</p> |

### 11.4. RAF Colerne Operations Record Books

Written records regarding the daily life and operation of Colerne have been obtained from the National Archives. These sources recorded the day-to-day operations of an airfield, as well as training exercises in the immediate and surrounding area. Photographs of these, highlighting relevant information, are shown in **Annex G**. General military activity during the war is presented below.

It should be noted that the transcript below is only a selection of the numerous events accounted for in the record book. Incidents of significant note are highlighted in bold:

| RAF Colerne Operations Record Books – Annex G1-G2 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|---------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Operations – Annex G1                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Date                                              | Transcription                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 18 <sup>th</sup> May 1943                         | 02:10. About 30 hostile aircraft crossed the South Coast on a fairly wide front and proceeded north through the Sector, making scattered raids in the South West and South Wales districts. JACKDAW 33 (F/Sgt Kemp) 151 Squadron operating from Colerne destroyed a Ju.88 near Minehead.                                                                                                                                                                                                                                                                                                                                                                                     |
| 2 <sup>nd</sup> March 1944                        | 03:05. Six aircraft (Mosquito XIII) of No. 151 Squadron were scrambled for Sopley, Durrington and Worth Matravers Control due to hostile raids approaching Beachy Head. "Limber 63" of No. 151 Squadron – pilot W/C G.H. Goodman & Nav./Radio F/O W.P.E. Thomas destroyed one Ju.88 and one HE.177 under Sopley Control. This aircraft made an emergency landing at RAF Station, Ford, being damaged by debris from exploding enemy aircraft and additionally the Navigator was injured. "Limber 16" – pilot S/L. Harrison and Navigator P/O Horrocks also destroyed a Ju.188 under Worth Matravers Control and "Limber 21" – Pilot F/L. Stevens and Navigator P/O. Aldridge |

|                                              | also destroyed a Ju.88 under Durrington Control – both aircraft of No. 151 Squadron. All the enemy aircraft were destroyed in Headquarters No.11 Group Area.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|----------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 24 <sup>th</sup> April 1944                  | Four Mosquito aircraft of No.219 Squadron were scrambled for Long Load and Sector Control for hostile raids scattered over the Sector. Three contacts were made; but two of these were lost owing to “window” and the third contact developed into a stern chase across the Channel and which had to be broken off. There was thick mist over Colerne airfield when the aircraft returned from patrol and which made it necessary to divert them all to RAF Station, Honiley. It was later learned that scattered bombs had been dropped in the vicinity of the Station at Batheaston, Somerset. Very little damage resulted and there were no casualties.                                                                                        |
| 6 <sup>th</sup> June 1944                    | “D” Day (Continued). All Mosquito aircraft which had been on patrol south of Cherbourg returned safely – the controls being completely uneventful.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Station Defences/Exercises – Annex G2</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Date                                         | Transcription                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| 31 <sup>st</sup> October 1940                | Military detachments co-operating in the Station Defence Scheme consisted of a detachment of the Staffordshire Regiment quartered in ASHWICKE PARK and a Section of the two three inch Anti-Aircraft (AA) Guns and one thirteen pounder field gun on the aerodrome.                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 16 <sup>th</sup> November 1941               | Defence Exercise in conjunction with Home Guard held on the Station.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| 3 <sup>rd</sup> September 1942               | A successful “Bullseye” exercise was held when approximately 20 friendly bombers crossed the sector and a number of interceptions took place.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Aircraft Crashes/Incidents – Annex G2</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Date                                         | Transcription                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| October 1942                                 | Once again there has been no enemy activity in Colerne Sector for the month of October 1942. On 2 <sup>nd</sup> October 1942 at 12:25 hours, a Mosquito aircraft DD369 (Pilot: S/Ldr. P.T. Parsons and Radio Operator P/O P.A. Harding of No. 264 Squadron), when making a single engine landing, crashed into the doors of the Fighter Hangar. Both members of the crew were killed instantaneously. Fire immediately broke out, and fire fighting was in progress two minutes after the outbreak. A call over the Tannoy for assistance met with enthusiastic response from all personnel on the Station, and the Hangar was rapidly cleared of several aircraft and equipment. The fire was finally extinguished after a period of 45 minutes. |
| 29 <sup>th</sup> September 1943              | 07:50. Mosquito on test crashed between Colerne Village and Airfield and burnt out. F/Lt. Griffin and Cpl. Blakeley killed.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| 9 <sup>th</sup> October 1943                 | 15:30. 1275328 Cpl. Shortland (Armourer) while destroying some 1940 “vintage” phosphorous bomb sustained while examining one bomb which had not exploded. Clothes in rags. First and second degree burns on right side from face to ankle. Admitted St. Martins Hospital, Bath.                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 2 <sup>nd</sup> January 1944                 | Mosquito crashed at the eastern end of 2.8 runway, Sub. Lieut. Cramp and Sub. Lieut. Jaffray suffering from shock and minor abrasions, treated in Crash Room and transferred to Sick Quarters, Box.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |

### 11.5. Aircraft Crashes

Aircraft crashes have occurred been historically common at military airfields, especially during wartime. These incidents most commonly occurred during take-off and landing. Consequently there is an increased level of risk associated to areas situated at the ends of airfield runways. The risk of contamination resulting from crashes depends on the nature of the incident and the aircraft involved. Airfields were not used solely by the aircraft stationed at that base, and an airfield may have been used by any aircraft during an emergency.

### 11.6. Historic Aerial Photography of RAF Colerne

High-resolution scans of WWII-era aerial photography for RAF Colerne were obtained from the National Monuments Record (Historic England). These images are presented in **Annex H**.

| Historic Aerial Photography of RAF Colerne – Annex H1 |                                                                                                                                                                                                                                                                                                                                                                                                                               |
|-------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Date                                                  | Comments                                                                                                                                                                                                                                                                                                                                                                                                                      |
| 14 <sup>th</sup> April 1946                           | <p>This image shows the airfield in the immediate post-WWII period. Much of the site consists of three Type K aircraft hangars, interlinked by taxiways. Numerous dispersed aircraft can be seen in this eastern section of the site. A roadway forming the perimeter of RAF Colerne runs through the west of the site.</p> <p>A view of the wider RAF Colerne site with features overlaid is located in <b>Annex H2</b>.</p> |

### 11.7. Evaluation of Contamination Risk from Allied UXO

1st Line Defence has considered the following potential sources of Allied ordnance contamination:

| Allied UXO Records Summary                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Sources of Allied UXO Contamination                                                                                                                                                                | Conclusion                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <p><b>Site Usage</b></p> <p><i>Airfields contain a number of features that may increase the risk of UXO contamination. Physical proximity to such a feature is usually indicative of risk.</i></p> | <p>The site was historically located within RAF Colerne. Located on a high plateau, the airfield was first surveyed in 1936 yet construction work did not commence until 1939. Initially opened under RAF Maintenance Command in January 1940, the airfield would be handed over to Fighter Command by June 1940, before the airfield's runways were finally completed in early 1941. RAF Colerne was Sector HQ for No. 10 Group Colerne with numerous operational fighter squadrons flying aircraft such as Hawker Hurricanes and Boulton Paul Defiants. De Havilland Mosquitos of No. 151 Squadron extensively used the airfield after 1943 and the airfield saw extensive activity around D-Day. Gloster Meteors of No. 616 Squadron arrived in early 1945, whilst Colerne became home to the first jet training unit, No 1335 Conversion Unit. In November 1946 RAF Colerne was transferred back to RAF Maintenance Command. It was subsequently turned over to Transport Command in 1957 who flew Handley Page Hastings and undertook servicing work. Whilst RAF Colerne closed in 1976 the site was taken on by the Army who opened Azimghur Barracks. The airfield has since been used to a limited extent.</p> <p>As a section of RAF Colerne, the eastern portion of the site occupied three Type K aircraft hangars and several taxiways. Further such features and a roadway ran through the west.</p> |
| <p><b>Dispersal Pans</b></p> <p><i>Dispersal pans were used to re-equip aircraft between sorties. Frequently temporary stores were located at dispersal pans.</i></p>                              | <p>Aircraft are known to have been dispersed across the site, especially in the east as shown by WWII-era aerial photography. The three Type K aircraft hangars would have also been used to re-equip aircraft with ordnance.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

|                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Ordnance Stores/Armoury</b><br><i>Ordnance stores contained large quantities of munitions. Adjacent areas may have been used to bury or dispose of excess ordnance.</i>                                                                            | <p>Whilst no evidence could be found to suggest that the site was located within proximity to the bomb stores or armoury, it is likely that items of ordnance were present in proximity to areas where aircraft were dispersed. Indeed, much of the east of the site is suspected to have used to re-equip fighter aircraft between sorties.</p> <p>A database of known disposal/clearance tasks has been referred to which makes note of an EOC task at Azimghur Barracks in 1998 which recovered 'old aircraft cannon shell heads' at the 'rear wall of [the] range'. Whilst this is noted as having taken place approximately 1km north of the site, it highlights the possibility of encountering RAF related ordnance at the former RAF Colerne.</p>                                                                                      |
| <b>Proximity to Perimeter Fence</b><br><i>Although seemingly innocuous, areas of open ground adjacent to the perimeter fence are considered of elevated risk as they were considered prime locations for ordnance burial.</i>                         | <p>The southern edge of the site formed the perimeter of RAF Colerne. Such areas are at an elevated risk as they were often used for ad-hoc ordnance disposal. Indeed, there would not necessarily be any evidence of such activity taking place.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Defensive Positions</b><br><i>Airfields were frequently defended by numerous defensive positions. It is not uncommon for items of LSA and SAA to be encountered in the vicinity of such locations.</i>                                             | <p>Several trench shelters were located in the east of the site.<sup>3</sup> Designed to protect service personnel in the event of an enemy air raid, they would likely not have held items of LSA, albeit personnel using them may well have had items SAA on their person.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Firing Ranges</b><br><i>Firing ranges were common at most airfields. Many firing range also feature grenade pits.</i>                                                                                                                              | <p>No evidence of firing ranges, practice butts or any other areas could be identified within the boundary of the site.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Demolition Charges</b><br><i>Many airfields were undermined by demolition mines such as McNaughton Tubes and Pipe Mines. Many of these devices were not removed or lost.</i>                                                                       | <p>No evidence of the use of demolition charges such as pipe mines and other area-denial weaponry at RAF Colerne could be found within available records.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Military Camps</b><br><i>It was frequent for military camps to be positioned adjacent to airfields. If a military camp was located proximate to a site then it is possible unauthorised ordnance disposal may have been undertaken in the area</i> | <p>Aside from RAF Colerne and the Army's use of Azimghur Barracks, 1st Line Defence could find no evidence of a separate Military Camp within proximity to the site</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Training Exercises / Home Guard Activity</b><br><i>It was common for defence training activities to be undertaken in the vicinity of airfields. Such exercises frequently involved the deployment of live ordnance.</i>                            | <p>Evidence of Home Guard activity is often difficult to locate, owing to the ad-hoc nature of Home Guard activity within each local area. Such training was often conducted on a small scale at the discretion of individual commanders and as such was seldom recorded officially. No positive evidence could be found to confirm the presence of HG units within proximity to RAF Colerne. Despite this, it should be noted that HG units were sometimes employed to defend or police RAF installations.</p> <p>Training was frequently undertaken at RAF bases as they were large, open military controlled areas. Such training has the potential to have involved the usage of land service ammunition such as grenades and mortars, which have the potential to have been defective or else incorrectly deployed and not recovered.</p> |

<sup>3</sup> [https://www.heritagegateway.org.uk/Gateway/Results\\_Single.aspx?uid=MW177979&resourceID=1047](https://www.heritagegateway.org.uk/Gateway/Results_Single.aspx?uid=MW177979&resourceID=1047)

|                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>Anti-Aircraft Defences</b></p> <p><i>Airfields were defended by a range of AAA. Ordnance is frequently encountered in the vicinity of AA batteries.</i></p>                                                                                                                                                                                                                                              | <p>Owing to the history of RAF Colerne, it is considered likely that local AA defence such as 40mm Bofors guns or machinegun posts may have been employed surrounding the airfield. Despite this, no indication could be found to suggest the precise location of any gun sites. The closest recorded anti-aircraft position was located approximately 8km to the south-west of the site.</p>                                                                                                                                                                                                                                                                                                                                                           |
| <p><b>Aircraft Crashes</b></p> <p><i>Aircraft crashes were common at airfields. The most common places for aircraft to crash was at the ends of runways. Airfield in the south of England were often used by damaged aircraft for the purposes of emergency landings. Crashes can be sources for potential UXO contamination, especially if the aircraft was en-route to or returning from operations.</i></p> | <p>Various aircraft are known to have crashed at RAF Colerne throughout its operational history. The station's Operations Record Books indicate that a de Havilland Mosquito crashed into one of the airfield's fighter hangars in October 1942. It is unclear which hangar was affected, and it should be noted that three fighter hangars were situated on site. Another Mosquito crashed between the airfield and Colerne village in September 1943. The site was positioned between the runways and the village. A further Mosquito came to grief at the end of Colerne's easternmost runway in January 1944, relatively close to the site.</p> <p>It should be noted that the exact location of the aforementioned incidents remain uncertain.</p> |

## 12. Introduction to German Air Delivered Ordnance

### 12.1. General

During the summer of 1940 the Luftwaffe launched a major offensive against British airfields. The campaign, known as the Battle of Britain, saw the Luftwaffe attempt to attain air superiority prior to the invasion of Great Britain. To this end they extensively bombed British airfields, especially within the South and East of England. Although the objectives of the Luftwaffe altered in September 1940 to encompass towns, cities and industry, airfields were regularly targeted by the Luftwaffe until the conclusion of the war. The specifics of any bombing within the RAF station or the surrounding area is discussed in the following sections.

The main focus of research for this section of the report will concern German air delivered ordnance dropped during WWII, although WWI bombing will also be considered.

### 12.2. Generic Types of WWII German Air Delivered Ordnance

To provide an informed assessment of the hazards posed by any items of unexploded ordnance that may remain in situ on site, the table below provides information on the types of German air delivered ordnance most commonly used by the Luftwaffe during WWII. Images and brief summaries of the characteristics of these items of ordnance are listed in **Appendices x-xii**.

| Generic Types of WWII German Air Delivered Ordnance |                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|-----------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Type                                                | Frequency                                                                                                                    | Likelihood of Detection                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| High Explosive (HE) bombs                           | In terms of weight of ordnance dropped, HE bombs were the most frequently deployed by the Luftwaffe during WWII.             | Although efforts were made to identify the presence of unexploded ordnance following an air raid, often the damage and destruction caused by detonated bombs made observation of UXB entry holes impossible. The entry hole of an unexploded bomb can be as little as 20cm in diameter and was easily overlooked in certain ground conditions (see <b>Annex I</b> ). Furthermore, ARP documents describe the danger of assuming that damage, actually caused by a large UXB, was due to an exploded smaller bomb. UXBs therefore present the greatest risk to present-day intrusive works. |
| 1kg Incendiary bombs (IB)                           | In terms of the number of weapons dropped, small IBs were the most numerous. Millions of these were dropped throughout WWII. | IBs had very limited penetration capability and in urban areas would often have been located in post-raid surveys. If they failed to initiate and fell in water, on soft vegetated ground, or bombed rubble, they could easily go unnoticed.                                                                                                                                                                                                                                                                                                                                               |
| Large Incendiary bombs (IB)                         | These were not as common as the 1kg IBs, although they were more frequently deployed than PMs and AP bomblets.               | If large IBs did penetrate the ground, complete combustion did not always occur and in such cases they could remain a risk to intrusive works.                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Aerial or Parachute mines (PM)                      | These were deployed less frequently than HE and IBs due to size, cost and the difficulty of deployment.                      | If functioning correctly, PMs would generally have had a slow rate of descent and were very unlikely to have penetrated the ground. Where the parachute failed, mines would have simply shattered on impact if the main charge failed to explode. There have been extreme cases when these items have been found unexploded. However, in these scenarios, the ground was either extremely soft or the munition fell into water.                                                                                                                                                            |
| Anti-personnel (AP) bomblets                        | These were not commonly used and are generally considered to pose a low risk to most works in the UK.                        | SD2 bomblets were packed into containers holding between 6 and 108 submunitions. They had little ground penetration ability and should have been located by the post-raid survey unless they fell into water, dense vegetation or bomb rubble.                                                                                                                                                                                                                                                                                                                                             |

### 12.3. Failure Rate of German Air Delivered Ordnance

It has been estimated that 10% of WWII German air delivered HE bombs failed to explode as designed. Reasons for why such weapons might have failed to function as designed include:

- Malfunction of the fuze or gain mechanism (manufacturing fault, sabotage by forced labour or faulty installation).
- Many were fitted with a clockwork mechanism that could become immobilised on impact.
- Failure of the bomber aircraft to arm the bombs due to human error or an equipment defect.
- Jettisoning the bomb before it was armed or from a very low altitude. This most likely occurred if the bomber aircraft was under attack or crashing.

From 1940 to 1945, bomb disposal teams reportedly dealt with a total of 50,000 explosive items of 50kg, over 7,000 anti-aircraft projectiles and 300,000 beach mines. Unexploded ordnance is still regularly encountered across the UK, see press articles in **Annex J**.

### 12.4. UXB Ground Penetration

An important consideration when assessing the risk from a UXB is the likely maximum depth of burial. There are several factors which determine the depth that an unexploded bomb will penetrate:

- Mass and shape of bomb.
- Height of release.
- Velocity and angle of bomb.
- Nature of the ground cover.
- Underlying geology.

Geology is perhaps the most important variable. If the ground is soft, there is a greater potential of deeper penetration. For example, peat and alluvium are easier to penetrate than gravel and sand, whereas layers of hard strata will significantly retard and may stop the trajectory of a UXB.

#### 12.4.1. The J-Curve Principle

J-curve is the term used to describe the characteristic curve commonly followed by an air delivered bomb dropped from height after it penetrates the ground. Typically, as the bomb is slowed by its passage through underlying soils, its trajectory curves towards the surface. Many UXBs are found with their nose cone pointing upwards as a result of this effect. More importantly, however, is the resulting horizontal offset from the point of entry. This is typically a distance of about one third of the bomb's penetration depth, but can be higher in certain conditions (see **Annex I**).

#### 12.4.2. WWII UXB Ground Penetration Studies

During WWII the Ministry of Home Security undertook a major study on actual bomb penetration depths, carrying out statistical analysis on the measured depths of 1,328 bombs as reported by bomb disposal (BD) teams. Conclusions were drawn predicting the likely average and maximum depths of penetration of different sized bombs in different geological strata.

For example, the largest common German bomb (500kg) had a likely concluded penetration depth of 6m in sand or gravel but 11m in clay. The maximum observed depth for a 500kg bomb was 11.4m and for a 1,000kg bomb 12.8m. Theoretical calculations suggested that significantly greater penetration depths were probable.

### 12.4.3. Site Specific Bomb Penetration Considerations

When considering an assessment of the bomb penetration at the site of proposed works the following parameters should be used:

- WWII geology – Chalfield Oolite Formation
- Impact angle and velocity – 10-15° from vertical and 270 metres per second.
- Bomb mass and configuration – The 500kg SC HE bomb, without retarder units or armour piercing nose (this was the largest of the common bombs used against Britain).

It has not been possible to determine maximum bomb penetration capabilities at this stage due to the absence of site-specific geotechnical information provided for the purpose of this report. An assessment can be made once further information becomes available or by an UXO Specialist on-site.

### 12.5. V-Weapons

Hitler's 'V-weapon' campaign began from mid-1944. It used newly developed unmanned cruise missiles and rockets. The V-1, known as the flying bomb or pilotless aircraft, and the V-2, a long range rocket, were launched from bases in Germany and occupied Europe. A total of 9,251 V-1s and 1,115 V-2s were recorded in the United Kingdom.

Although these weapons caused considerable damage, their range was limited by their position of deployment across Europe and as a result the vast majority of V-weapon strikes were directed against targets in the south-east of England, predominantly in the London Boroughs and Home Counties. This limitation of capability meant targets in Wiltshire were generally too far to be considered for V-weapon strikes by the Luftwaffe. The risk from V-weapons is therefore considered negligible and will not be further addressed in this report.

### 13. The Likelihood of Contamination from German Air Delivered UXBs

#### 13.1. World War I

During WWI Britain was targeted and bombed by Zeppelin Airships as well as Gotha and Giant fixed-wing aircraft. The objective of these raids was to unnerve the British public, to destroy strategic targets and to ultimately attempt to coerce Britain's capitulation from the war. A WWI map of air raids and naval bombardments across the UK was consulted, see **Annex K**. This source shows that neither the site nor the wider county of Wiltshire were targeted during WWI.

WWI bombs were generally smaller and dropped from a lower altitude than those used in WWII. This resulted in limited UXB penetration depths. Aerial bombing was often such a novelty at the time that it attracted public interest and even spectators to watch the raids in progress. For these reasons there is a limited risk that UXBs passed undiscovered in the urban environment. When combined with the relative infrequency of attacks and an overall low bombing density, the risk from WWI UXBs is considered low and will not be further addressed in this report.

#### 13.2. World War II Bombing of the Calne and Chippenham Rural District

Luftwaffe bombing tactics at the start of WWII prioritised on the destruction of strategic military targets, which if destroyed would pave the way for Operation Sea Lion, the planned amphibious invasion of Britain. Accordingly, in the years preceding WWII, German military intelligence meticulously mapped and photographed RAF stations designating them as strategic bombing targets. When the German strategic bombing campaign began in July 1940, fighter and bomber stations as well as RAF Chain Home radar stations were systematically targeted, severely limiting the RAF's capability to defend the country.

By the end of August 1940 the RAF was in disarray and close to collapse, with airfields badly damaged and aircrew losses critical. However, retaliatory bombing raids on Berlin by RAF Bomber Command throughout August had angered Hitler, and on 4<sup>th</sup> September 1940 Hitler announced in a speech his directive to 'erase' Britain's cities. This change in tactics gave the RAF a chance to rebuild and rearm, and ultimately, despite the civilian cost, prevented German air dominance in Britain's skies.

During WWII the site was located within the Calne and Chippenham Rural District, which sustained an overall very low density of bombing, as represented by bomb density data figures, see **Section 13.3**. This was mainly due to the agricultural nature of the district, with the few strategic targets being airfields such as RAF Colerne as shown by Luftwaffe target mapping and reconnaissance imagery presented in **Annex L**.

Records of bombing incidents in the civilian areas of the district were typically collected by Air Raid Precautions wardens and collated by Civil Defence personnel. Some other organisations, such as port and railway authorities, maintained separate records. Records would be in the form of typed or hand written incident notes, maps and statistics. Bombing data was carefully analysed, not only due to the requirement to identify those parts of the country most needing assistance, but also in an attempt to find patterns in the Germans' bombing strategy in order to predict where future raids might take place.

Records of bombing incidents are presented in the following sections.

### 13.3. WWII Home Office Bombing Statistics

The following table summarises the quantity of German air delivered bombs (excluding 1kg incendiaries and anti-personnel bombs) dropped on the Calne and Chippenham Rural District between 1940 and 1945.

| Record of German Ordnance Dropped on the Calne and Chippenham Rural District |                                  |        |
|------------------------------------------------------------------------------|----------------------------------|--------|
| Area Acreage                                                                 |                                  | 86,034 |
| Weapons                                                                      | High Explosive bombs (all types) | 197    |
|                                                                              | Parachute mines                  | 0      |
|                                                                              | Oil bombs                        | 0      |
|                                                                              | Phosphorus bombs                 | 0      |
|                                                                              | Fire pots                        | 0      |
|                                                                              | Pilotless aircraft (V-1)         | 00     |
|                                                                              | Long range rocket bombs (V-2)    | 0      |
| Total                                                                        |                                  | 197    |
| Number of Items per 1,000 acres                                              |                                  | 2.3    |
| Source: Home Office Statistics                                               |                                  |        |
| This table does not include UXO found during or after WWII.                  |                                  |        |

Detailed records of the quantity and locations of the 1kg incendiary and anti-personnel bombs were not routinely maintained by the authorities as they were frequently too numerous to record. Although the risk relating to IBs is lesser than that relating to larger HE bombs, they were similarly designed to inflict damage and injury. Anti-personnel bombs were used in much smaller quantities and are rarely found today but are potentially more dangerous. Although Home Office statistics did not record these types of ordnance, both should not be overlooked when assessing the general risk to personnel and equipment.

### 13.4. South-West Civil Defence Daily Summaries

Daily summaries were compiled for the Office of the Regional Commissioner during WWII and have been consulted at the Somerset Heritage Centre. These reports recorded information such as the date, time, type and damage caused by bomb incidents.

A transcript of the associated written records of bomb incidents in close proximity to the site is presented in the table below. An example of this record and imagery showing the approximate locations of these incidents are presented in **Annex M**.

| South-West Civil Defence Daily Summaries – Annex M1-M2 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|--------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Date Range                                             | Transcription and Comments                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| 12 <sup>th</sup> September 1940<br>– <b>Annex M1</b>   | <p><u>CIVIL DEFENCE</u><br/> <u>OFFICE OF THE REGIONAL COMMISSIONER</u><br/> <u>DAILY SUMMARY NO.44</u><br/> <u>Period 18:00, 12<sup>th</sup> September 1941 to 18:00, 14<sup>th</sup> September 1940</u></p> <p>Colerne. Six miles west of Chippenham at 15:30, 12<sup>th</sup> September. One high explosive (HE) bomb and one incendiary bomb (IB).</p> <p><i>It is unclear exactly where these two bombs fell within Colerne</i></p>                                        |
| 18 <sup>th</sup> September 1940<br>– <b>Annex M1</b>   | <p><u>CIVIL DEFENCE</u><br/> <u>OFFICE OF THE REGIONAL COMMISSIONER</u><br/> <u>DAILY SUMMARY NO.50</u><br/> <u>Period 18:00, 18<sup>th</sup> September 1941 to 18:00, 19<sup>th</sup> September 1940</u></p> <p><u>Colerne</u>. Lucknam Park. Six miles west-south-west of Chippenham. 21:35, 18<sup>th</sup> September, four HE bombs.</p> <p><i>Lucknam Park is situated approximately 1.3km north-east of the site</i></p>                                                  |
| 18 <sup>th</sup> November 1940 –<br><b>Annex M1</b>    | <p><u>CIVIL DEFENCE</u><br/> <u>OFFICE OF THE REGIONAL COMMISSIONER</u><br/> <u>DAILY SUMMARY NO.111</u><br/> <u>Period 12:00, 18<sup>th</sup> November 1940 to 12:00, 19<sup>th</sup> November 1940</u></p> <p>COLERNE: 04:00, 18<sup>th</sup> November, one unexploded bomb (UXB)</p> <p><i>It is unclear exactly where this UXB fell within Colerne</i></p>                                                                                                                  |
| 10 <sup>th</sup> April 1941 –<br><b>Annex M1</b>       | <p><u>CIVIL DEFENCE</u><br/> <u>OFFICE OF THE REGIONAL COMMISSIONER</u><br/> <u>DAILY SUMMARY NO.226</u><br/> <u>Period 12:00, 10<sup>th</sup> April 1941 to 12:00, 11<sup>th</sup> April 1941</u></p> <p>COLERNE: Six miles west of CHIPPENHAM at 02:00, 10<sup>th</sup> April. Three HE bombs on Air Ministry land.</p> <p><i>These are thought to have dropped on the aerodrome between the main and temporary landing grounds, likely in the north of the aerodrome</i></p> |

|                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|--------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 3 <sup>rd</sup> May 1941 –<br><b>Annex M2</b>    | <p style="text-align: center;"><u>CIVIL DEFENCE</u><br/> <u>OFFICE OF THE REGIONAL COMMISSIONER</u><br/> <u>DAILY SUMMARY NO.245</u><br/> <u>Period 12:00, 3<sup>rd</sup> May 1941 to 12:00, 4<sup>th</sup> May 1941</u></p> <p>WILTSHIRE. COLERNE at Hunters Hall, County Boundary, at 22:50, 3<sup>rd</sup> May – several IBs all dealt with. No damage</p> <p style="text-align: center;"><i>These are thought to have dropped approximately 1.3km south-west of the site</i></p>                                                               |
| 12 <sup>th</sup> May 1941 –<br><b>Annex M2</b>   | <p style="text-align: center;"><u>CIVIL DEFENCE</u><br/> <u>OFFICE OF THE REGIONAL COMMISSIONER</u><br/> <u>DAILY SUMMARY NO.253</u><br/> <u>Period 12:00, 11<sup>th</sup> May 1941 to 12:00, 12<sup>th</sup> May 1941</u></p> <p>WILTSHIRE. COLERNE: Six and a half miles west-south-west Chippenham at 02:18, 12<sup>th</sup> May. Three HE bombs of heavy calibre in fields near Colerne-Box road. No damage.</p> <p style="text-align: center;"><i>These are thought to have fallen to the south of the village of Colerne</i></p>             |
| 25 <sup>th</sup> April 1942 –<br><b>Annex M2</b> | <p style="text-align: center;"><u>CIVIL DEFENCE</u><br/> <u>OFFICE OF THE REGIONAL COMMISSIONER</u><br/> <u>DAILY SUMMARY NO.354</u><br/> <u>Period 12:00, 26<sup>th</sup> April 1942 to 12:00, 27<sup>th</sup> April 1942</u></p> <p>MARSHFIELD. Two and a half miles south-south-east of, at ROCK PARK, HUNTERS HALL, at 23:10, 25<sup>th</sup> April. Five HE bombs. Slight damage to farm and telephone wires. No casualties.</p> <p style="text-align: center;"><i>These are thought to have fallen some 1.5km south-west of the site</i></p> |

### 13.5. RAF Colerne Operations Record Books

As introduced in [Section 11.4](#), Operations Record Books for RAF Colerne were obtained from The National Archives. Operations record books for RAF stations detail all significant events that took place during the period of their use by the military. This also included any attacks/bombing by Luftwaffe aircraft at the base in question. These log books were checked for any reference to air raids and bomb damage within and in the immediate area of the aerodrome throughout the war. Extracts from the record book, showing examples of Luftwaffe bombing of the station, can be seen below and in **Annex N**.

| RAF Colerne Operations Record Book (German Bombing) – Annex N |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|---------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Date Range                                                    | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| 10 <sup>th</sup> April 1941                                   | <p>02:30. Three 50kg bombs dropped on the Aerodrome between the main and temporary landing grounds, no damage.</p> <p><i>This incident appears to have taken place in the northernmost part of the aerodrome, approximately 1km north of the site. Albeit the exact location of where these fell is uncertain</i></p>                                                                                                                                                                                           |
| 3 <sup>rd</sup> May 1941                                      | <p>23:30. A number of incendiary bombs were dropped on the western side of the Aerodrome by an enemy aircraft, no damage. Also two 250kg bombs fell about 200 yards from the south-west corner of the aerodrome, both unexploded.</p> <p><i>These likely fell some 1km south-west of the site, although the exact position of the unexploded bombs is unclear</i></p>                                                                                                                                           |
| 25 <sup>th</sup> – 26 <sup>th</sup> April 1942                | <p>The month of April 1942 has again been until its end very quiet, when the comparative peace of recent months was ended by the violent bombing attacks on Bath, which occurred on the nights of the 25<sup>th</sup> and 26<sup>th</sup>. The station was not affected further than that some corrugated sheeting on a Nissen hut was moved by one stick of bombs dropped from Hunter's Hall to the grounds of the Rocks.</p> <p><i>These are thought to have fallen some 1.5km south-west of the site</i></p> |

### 13.6. WWII-Era Aerial Photography

WWII-era aerial photography for the site area was obtained from the National Archives and Records Administration (NARA) and the National Monuments Record Office (Historic England). This photography provides a record of the composition of the site during the war, as well as its condition immediately following the war (see **Annex O**).

| WWII-Era Aerial Photography – Annex O1-O2           |                                                                                                                                                                                                                                                                                                                                                                                                                    |
|-----------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Date/Title                                          | Description                                                                                                                                                                                                                                                                                                                                                                                                        |
| 11 <sup>th</sup> December 1940<br>– <b>Annex O1</b> | <p>This image shows that the site occupies three large Type K aircraft hangars, in addition to taxiways, roadway and open ground.</p> <p>No obvious evidence of bomb damage can be seen across the site. Rubble and debris would be indicative of such attacks across the developed areas of the site, whilst cratering, disturbed ground, and scattered earth would be applicable to open areas.</p>              |
| 14 <sup>th</sup> April 1946 –<br><b>Annex O2</b>    | <p>Taken in the immediate post-WWII period, this image indicates that the site has largely retained its composition from the previous available photograph.</p> <p>Once more, no clear signs of wartime-era damage can be seen. These would again include rubble and debris across the developed sections, with cratering, disturbed ground, and scattered earth indicative of damage across undeveloped land.</p> |

### 13.7. Abandoned Bombs

A post air-raid survey of buildings, facilities, and installations would have included a search for evidence of bomb entry holes. If evidence of an entry hole was encountered, Bomb Disposal Officer Teams would normally have been requested to attempt to locate, render safe, and dispose of the bomb. Occasionally, evidence of UXBs was discovered but due to a relatively benign position, access problems, or a shortage of resources the UXB could not be exposed and rendered safe. Such an incident may have been recorded and noted as an 'abandoned bomb'.

Given the inaccuracy of WWII records, and the fact that these bombs were 'abandoned', their locations cannot be considered definitive or the lists exhaustive. The MoD states that 'action to make the devices safe would be taken only if it was thought they were unstable'. It should be noted that other than the 'officially' abandoned bombs, there will inevitably be UXBs that were never recorded.

1st Line Defence holds no records of officially registered abandoned bombs at or near the site of the proposed works.

### 13.8. Bomb Disposal Tasks

The information service from the Explosive Ordnance Disposal (EOD) Archive Information Office at 33 Engineer Regiment (now part of 29 EOD & Search Group) no longer processes commercial requests for information. It has therefore not been possible to include any updated official information regarding bomb disposal/clearance tasks with regards to this site.

A database of known disposal/clearance tasks has been referred to which makes note of an EOC task at Azimghur Barracks in 1998 which recovered 'old aircraft cannon shell heads' at the 'rear wall of [the] range'. This is noted as having taken place approximately 1km north of the site, although it highlights the possibility of encountering RAF related ordnance at the former RAF Colerne.

### 13.9. Evaluation of German Air Delivered UXO Records

| German Air Delivered UXO Records Summary                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Factors                                                                                                                                                                                                                                                                                                                                                                                                    | Conclusion                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Density of Bombing</b><br><i>It is important to consider the bombing density when assessing the possibility that UXBs remain in an area. High bombing density could allow for error in record keeping due to extreme damage caused to the area.</i>                                                                                                                                                     | <p>During WWII the site was situated within the Calne and Chippenham Rural District. According to official Home Office bombing statistics this district sustained a very low density of bombing with 197 items of ordnance recorded across the 86,034 acre district, or an average of 2.3 items per 1,000 acres. This was mainly due to the agricultural nature of the district, with the few strategic targets being airfields such as RAF Colerne as shown by Luftwaffe target mapping and reconnaissance imagery presented in <b>Annex L</b>.</p> <p>South-West Civil Defence Daily Summaries and RAF Colerne's Operational Record Book indicate that the airfield was directly impacted by bombing on at least three occasions. On 10<sup>th</sup> April 1941 two 50kg HE Bombs struck the north of the aerodrome, between the main and temporary landing grounds. Thereafter, on 3<sup>rd</sup> May 1941 two unexploded bombs fell about 200 yards from the south-west corner of the aerodrome. Falling some 1km south-west of the site, the exact position of the unexploded bombs and exactly how they were dealt with is not known. Another incident occurred on 25<sup>th</sup> April 1942 when Nissen huts within the airfield were damaged by a stick of bombs that fell between Hunter's Hall and the Rocks, some 1.5km south-west of the site.</p> <p>It should be noted that South-West Civil Defence Daily Summaries note further incidents within the civil parish of Colerne but does not provide exact locations. Therefore, it is quite possible that other bombing incidents occurred in closer proximity to the site than those described above.</p> |
| <b>Damage</b><br><i>If buildings or structures on a site sustained bomb or fire damage, any resulting rubble and debris could have obscured the entry holes of unexploded bombs dropped during the same or later raids. Similarly, a high explosive bomb strike in an area of open agricultural land will have caused soil disturbance, increasing the risk that a UXB entry hole would be overlooked.</i> | <p>WWII-era aerial photography, dated 1940 and 1946, does not provide any obvious evidence of wartime-era damage. Rubble and debris would be indicative of such attacks across the developed areas of the site, whilst cratering, disturbed ground, and scattered earth would be applicable to open areas.</p> <p>RAF Colerne's Operations Record Book notes that a Nissen hut's corrugated sheeting was damaged by the stick of bombs that fell on 25<sup>th</sup> April 1942. The exact location of the hut is unknown, but it may have been in the south-west corner of the aerodrome, at least 1km south-west of the site.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Ground Cover</b><br><i>The nature of the ground cover present during WWII would have a substantial influence on any visual indication that may indicate UXO being present.</i>                                                                                                                                                                                                                          | <p>The nature of groundcover across the vast majority of the site is anticipated to have been largely conducive toward particularly the detection of UXO throughout the war. This is because in developed areas with aircraft hangars and taxiways, UXBs would have left a highly visible trail of rubble and debris. This reduces the likelihood of UXO going missing and unreported.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Access Frequency</b><br><i>UXO in locations where access was irregular would have a greater chance of passing unnoticed than at those that were regularly occupied. The importance of a site to the war effort is also an important consideration as such sites are likely to have been both frequently visited and subject to post-raid checks for evidence of UXO.</i>                                | <p>Given that the site occupied aircraft hangars and taxiways within an active RAF station, access would have been frequent with aircraft being dispersed across this area.</p> <p>A good degree of coverage reduces the likelihood of UXO going missing and unreported.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Bomb Failure Rate</b>                                                                                                                                                                                                                                                                                                                                                                                   | <p>There is no evidence to suggest that the bomb failure rate in the locality of the site would have been dissimilar to the 10% normally used.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |

|                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Abandoned Bombs</b>     | 1st Line Defence holds no records of abandoned bombs at or within the site vicinity.                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Bombing Decoy sites</b> | 1st Line Defence could find no evidence of bombing decoy sites within the site vicinity.                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Bomb Disposal Tasks</b> | 1st Line Defence could find no evidence German UXO related bomb disposal tasks within the site boundary and immediate area. However, a database of known disposal/clearance tasks has been referred to which makes note of an EOC task at Azimghur Barracks in 1998 which recovered 'old aircraft cannon shell heads' at the 'rear wall of [the] range'. This is noted as having taken place approximately 1km north of the site, although it highlights the possibility of encountering RAF related ordnance at the former RAF Colerne. |

## 14. The Likelihood of UXO Contamination Summary

The following table assesses the likelihood that the site was contaminated by items of German air delivered and Allied ordnance. Factors such as the risk of UXO initiation, remaining, and encountering will be discussed later in the report.

| UXO Contamination Summary        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|----------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Quality of the Historical Record | <p>The research has evaluated pre- and post-WWII Ordnance Survey maps, historic imagery of RAF Colerne, RAF Colerne an Air Ministry Site and Station Defence Plan, RAF Colerne's Operations Record Book, Luftwaffe target mapping and reconnaissance imagery, South-West Civil Defence Daily Summaries, WWII-era aerial photography, and anecdotal information available online and in-print.</p> <p>The record set is generally adequate. Given that the site has been until relatively recently remained in military use, limited plans of the airfield were available.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Allied Ordnance                  | <ul style="list-style-type: none"> <li>The site was historically located within RAF Colerne. Located on a high plateau, the airfield was first surveyed in 1936 yet construction work did not commence until 1939. Initially opened under RAF Maintenance Command in January 1940, the airfield would be handed over to Fighter Command by June 1940, before the airfield's runways were finally completed in early 1941. The station was Sector HQ for No. 10 Group Colerne with numerous operational fighter squadrons flying aircraft such as Hawker Hurricanes and Boulton Paul Defiants. De Havilland Mosquitos of No. 151 Squadron extensively used the airfield after 1943 and the airfield saw extensive activity around D-Day. Gloster Meteors of No. 616 Squadron arrived in early 1945, whilst Colerne became home to the first jet training unit, No 1335 Conversion Unit. In November 1946 RAF Colerne was transferred back to RAF Maintenance Command. It was subsequently turned over to Transport Command in 1957 who flew Handley Page Hastings and undertook servicing work. Whilst RAF Colerne closed in 1976 the site was taken on by the Army who opened Azimghur Barracks. The airfield has since been used to a limited extent.</li> <li>As a section of RAF Colerne, the eastern portion of the site occupied three Type K aircraft hangars and several taxiways. Further such features and a roadway ran through the west. Aircraft are known to have been dispersed across the site, especially in the east as shown by WWII-era aerial photography dated 1940 and 1946. The three Type K aircraft hangars would have also been used to re-equip aircraft with items of ordnance.</li> <li>Whilst no evidence could be found to suggest that the site was located within proximity to the bomb stores or armoury, it is likely that items of ordnance were present in proximity to areas where aircraft were dispersed. Indeed, much of the east of the site is suspected to have used to re-equip fighter aircraft between sorties. A database of known disposal/clearance tasks has been referred to which makes note of an EOC task at Azimghur Barracks in 1998 which recovered 'old aircraft cannon shell heads' at the 'rear wall of [the] range'. Whilst this is noted as having taken place approximately 1km north of the site, it highlights the possibility of encountering RAF related ordnance at the former RAF Colerne.</li> <li>The southern edge of the site formed the perimeter of RAF Colerne. Such areas are at an elevated risk as they were often used for ad-hoc ordnance disposal.</li> <li>Several trench shelters were located in the east of the site.<sup>4</sup> Designed to protect service personnel in the event of an enemy air raid, they would likely not have held items of LSA, albeit personnel using them may well have had items SAA on their person.</li> <li>Various aircraft are known to have crashed at RAF Colerne throughout its operational history. The station's Operations Record Books indicate that a de Havilland Mosquito crashed into one of the airfield's fighter hangars in October 1942. It is unclear which hangar was affected, and it should be noted that three fighter hangars were situated on site. Another Mosquito crashed between the airfield and Colerne village in September 1943. The site was positioned between the runways and the village. A further Mosquito came to grief at the end of Colerne's easternmost runway in January 1944, relatively close to the</li> </ul> |

<sup>4</sup> [https://www.heritagegateway.org.uk/Gateway/Results\\_Single.aspx?uid=MW177979&resourceID=1047](https://www.heritagegateway.org.uk/Gateway/Results_Single.aspx?uid=MW177979&resourceID=1047)

|                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|--------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                      | <p>site. It should be noted that the exact location of the aforementioned incidents remain uncertain.</p> <ul style="list-style-type: none"> <li>• In summary, the site was located within RAF Colerne, a fighter airfield that saw active use throughout the war as well as during the Cold War under Transport Command. During its usage, the site held three Type K aircraft hangars, an area where aircraft were re-equipped with ordnance between sorties. Indeed, aircraft were dispersed more widely across the site. These factors potentially increase the risk of UXO contamination occurring on/in the vicinity of the site in addition to the potential for aircraft crashes and ad-hoc ordnance disposal in proximity to the airfield's perimeter.</li> <li>• Overall, given the site's history and location, the risk of contamination from buried, lost/discarded Allied UXO cannot be discounted. As such, the site has been assessed as holding an overall <b>Medium Risk</b> from Allied UXO contamination. It is recommended that <b>open excavation works are supported by a UXO Specialist</b> as a precaution and that <b>UXO Safety and Awareness Briefings</b> are provided to all ground personnel. In any undeveloped areas of the site, it may be possible to carry out a <b>non-intrusive magnetometer survey</b> and <b>target investigation</b>.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>German Air-Delivered Ordnance</b> | <ul style="list-style-type: none"> <li>• During WWII the site was situated within the Calne and Chippenham Rural District. According to official Home Office bombing statistics this district sustained a very low density of bombing with 197 items of ordnance recorded across the 86,034 acre district, or an average of 2.3 items per 1,000 acres.</li> <li>• South-West Civil Defence Daily Summaries and RAF Colerne's Operational Record Book indicate that the airfield was directly impacted by bombing on at least three occasions. On 10th April 1941 two 50kg HE Bombs struck the north of the aerodrome, between the main and temporary landing grounds. Thereafter, on 3rd May 1941 two unexploded bombs fell about 200 yards from the south-west corner of the aerodrome. Falling some 1km south-west of the site, the exact position of the unexploded bombs and exactly how they were dealt with is not known. Another incident occurred on 25th April 1942 when Nissen huts within the airfield were damaged by a stick of bombs that fell between Hunter's Hall and the Rocks, some 1.5km south-west of the site. It should be noted that South-West Civil Defence Daily Summaries note further incidents within the civil parish of Colerne but does not provide exact locations. Therefore, it is quite possible that other bombing incidents occurred in closer proximity to the site than those described above.</li> <li>• WWII-era aerial photography, dated 1940 and 1946, does not provide any obvious evidence of wartime-era damage. Rubble and debris would be indicative of such attacks across the developed areas of the site, whilst cratering, disturbed ground, and scattered earth would be applicable to open areas. RAF Colerne's Operations Record Book notes that a Nissen hut's corrugated sheeting was damaged by the stick of bombs that fell on 25th April 1942. The exact location of the hut is unknown, but it may have been in the south-west corner of the aerodrome, at least 1km south-west of the site.</li> <li>• The nature of groundcover across the vast majority of the site is anticipated to have been largely conducive toward particularly the detection of UXO throughout the war. This is because in developed areas with aircraft hangars and taxiways, UXBs would have left a highly visible trail of rubble and debris. This reduces the likelihood of UXO going missing and unreported.</li> <li>• Given that the site occupied aircraft hangars and taxiways within an active RAF station, access would have been frequent with aircraft being dispersed across this area. A good degree of coverage reduces the likelihood of UXO going missing and unreported.</li> <li>• In summary, no positive evidence could be found to suggest that the site was directly bombed during WWII. Whilst three incidents are recorded at RAF Colerne, none are thought to have affected the site. Aerial imagery from 1940 and 1946 shows no obvious indicators of bombing or damage on or adjacent to the site. Indeed the site would have benefitted from increased access levels being within an active RAF station. This would have significantly reduced the likelihood of UXO going missing and unreported. As a result of the above factors the site has been assessed to be at an overall <b>Low Risk</b> from German air-delivered UXO.</li> </ul> |

## **15. The Likelihood that UXO Remains**

### **15.1. Introduction**

It is important to consider the extent to which any explosive ordnance clearance (EOC) activities or extensive ground works have occurred on site. This may indicate previous ordnance contamination or reduce the risk that ordnance remains undiscovered.

### **15.2. UXO Clearance**

Former military sites (or at least certain areas within their footprint) are often subject to clearance before they are returned to civilian use by the MoD. If a site is retained by the military, it is possible that no clearance operations have ever been undertaken. However, UXO is sometimes still discovered even on sites where clearance operations are known to have been undertaken. The detail and level of survey and targeted investigation undertaken by the military will depend on the former use of the site and purpose of the clearance (i.e. disposal, redevelopment, return to agriculture, etc.). The level of clearance will also depend on the available technology, resources and practices of the day.

It therefore cannot be assumed that the risk of UXO remaining has been completely mitigated, even though EOC tasks have been undertaken at a former military site.

### **15.3. Post-War Redevelopment**

The extent of works/development and depth of foundations/excavations that have been undertaken on site post-war (or during/post military use) can have a significant effect on the risk of UXO remaining in situ in those areas.

Limited development has taken place on site since WWII. The three K Type aircraft hangars remain on site in addition to hardstanding and taxiways.

The risk of UXO remaining is considered to be mitigated at the location of and down to the depth of any post-war redevelopment on site. For example, the risk from deep buried UXO will only have been mitigated within the volumes of any post-war pile foundations or deep excavations for basement levels. The risk will however remain within virgin geology below and amongst these post-war works, down to the maximum bomb penetration depth.

## **16. The Likelihood of UXO Encounter**

### **16.1. Introduction**

For UXO to pose a risk at a site, there should be a means by which any potential UXO might be encountered on that site.

The likelihood of encountering UXO on the site of proposed works would depend on various factors, such as the type of UXO that might be present and the intrusive works planned on site. In most cases, UXO is more likely to be present below surface (buried) than on surface.

In general, the greater the extent and depth of intrusive works, the greater the risk of encountering. The most likely scenarios under which items of UXO could be encountered during construction works is during piling, drilling operations or bulk excavations for basement levels. The overall risk will depend on the extent of the works, such as the numbers of boreholes/piles (if required) and the volume of the excavations.

Generally speaking, the risk of encountering any type of UXO will be minimal for any works planned within the footprint and down to the depth of post-war foundations and excavations.

### **16.2. Encountering Air Delivered Ordnance**

Since an air delivered bomb may come to rest at any depth between just below ground level and its maximum penetration depth, there is a chance that such an item (if present) could be encountered during shallow excavations (for services or site investigations) into the original WWII ground level as well as at depth.

### **16.3. Land Service/Small Arms Ammunition Encounter**

Items of LSA and SAA are mostly encountered in areas previously used for military training. Such items could have been lost, burnt, buried or discarded during being in use by the military. Due to this, LSA are most likely to be encountered at relatively shallow depths – generally in the top 1m below ground level. Therefore, such items are most likely to be encountered during open excavation works. In some cases, there is the potential that LSA or SAA may be present on the surface of the ground – especially in areas with active military use or were recently in use by the MoD.

## 17. The Likelihood of UXO Initiation

### 17.1. Introduction

UXO does not spontaneously explode. Older UXO devices will require an external event/energy to create the conditions for detonation to occur. The likelihood that a device will function can depend on a number of factors including the type of weaponry, its age and the amount of energy it is struck with.

### 17.2. Initiating Air Delivered Ordnance

Unexploded bombs do not spontaneously explode. All high explosive filling requires significant energy to create the conditions for detonation to occur.

In recent decades, there have been a number of incidents in Europe where Allied UXBs have detonated, and incidents where fatalities have resulted. There have been several hypotheses as to the reason why the issue is more prevalent in mainland Europe – reasons could include the significantly greater number of bombs dropped by the Allied forces on occupied Europe, the preferred use by the Allies of mechanical rather than electrical fuzes, and perhaps just good fortune. The risk from UXO in the UK is also being treated very seriously in many sectors of the construction industry, and proactive risk mitigation efforts will also have affected the lack of detonations in the UK.

There are certain construction activities which make initiation more likely, and several potential initiation mechanisms must be considered:

| UXB Initiation                |                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|-------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Direct Impact</b>          | Unless the fuze or fuze pocket is struck, there needs to be a significant impact e.g. from piling or large and violent mechanical excavation, onto the main body of the weapon to initiate a buried iron bomb. Such violent action can cause the bomb to detonate.                                                                                                                                                                             |
| <b>Re- starting the Clock</b> | A small proportion of German WWII bombs employed clockwork fuzes. It is probable that significant corrosion would have taken place within the fuze mechanism over the last 70+ years that would prevent clockwork mechanisms from functioning. Nevertheless, it was reported that the clockwork fuze in a UXB dealt with by 33 EOD Regiment in Surrey in 2002 did re-start.                                                                    |
| <b>Friction Impact</b>        | The most likely scenario resulting in the detonation of a UXB is friction impact initiating the shock-sensitive fuze explosive. The combined effects of seasonal changes in temperature and general degradation over time can cause explosive compounds to crystallise and extrude out from the main body of the bomb. It may only require a limited amount of energy to initiate the extruded explosive which could detonate the main charge. |

### 17.3. Land Service /Small Arms Ammunition Initiation

Items of LSA generally do not become inert or lose their effectiveness with age. Time can cause items to become more sensitive and less stable. This applies equally to items submerged in water or embedded in silts, clays, or similar materials. The greatest risk occurs when an item of ordnance is struck or interfered with. This is likely to occur when mechanical equipment is used or when unqualified personnel pick up munitions.

If left alone, an item of LSA will pose little/no risk of initiation. Therefore, if it is not planned to undertake construction/intrusive works at the site, the risk of initiation of any LSA that may be present would be negligible. Similarly, those accessing a contaminated area would be at minimal risk if they do not interfere with any UXO present on the ground. Clearly for many end uses, however, the presence of UXO anywhere on a site would not be acceptable as it could not be guaranteed that the items will not be handled, struck or otherwise affected, increasing the likelihood of initiation.

Items of SAA are much less likely to detonate than LSA or UXBs, but can be accidentally initiated by striking the casing, coming into contact with fire, or being tampered with/dismantled. It is likely that the detonation of an item of SAA would result in a small explosion, as the pressure would not be contained within a barrel. Detonation would only result in local overpressure and very minor fragmentation from the cartridge case.

## **18. Consequences of Initiation/Encounter**

### **18.1. Introduction**

The repercussions of the inadvertent detonation of UXO during intrusive ground works, or if an item or ordnance is interfered with or disturbed, are potentially profound, both in terms of human and financial cost. A serious risk to life and limb, damage to plant and total site shutdown during follow-up investigations are potential outcomes. However, if appropriate risk mitigation measures are put in place, the chances of initiating an item of UXO during ground works is comparatively low.

The consequences of encountering UXO can be particularly notable in the case of high-profile sites (such as airports and train stations) where it is necessary to evacuate the public from the surrounding area. A site may be closed for anything from a few hours to a week with potentially significant cost in lost time. It should be noted that even the discovery of suspected or possible item of UXO during intrusive works (if handled solely through the authorities), may also involve significant loss of production.

### **18.2. Consequences of Detonation**

When considering the potential consequences of a detonation, it is necessary to identify the significant receptors that may be affected. The receptors that may potentially be at risk from a UXO detonation on a construction site will vary depending on the site specific conditions but can be summarised as follows:

- People – site workers, local residents and general public.
- Plant and equipment – construction plant on site.
- Services – subsurface gas, electricity, telecommunications.
- Structures – not only visible damage to above ground buildings, but potentially damage to foundations and the weakening of support structures.
- Environment – introduction of potentially contaminating materials.

## 19. 1st Line Defence Risk Assessment

### 19.1. Risk Assessment Stages

Taking into account the quality of the historical evidence, the assessment of the overall risk from unexploded ordnance is based on the following five considerations:

1. That the site was contaminated with unexploded ordnance.
2. That unexploded ordnance remains on site.
3. That such items will be encountered during the proposed works.
4. That ordnance may be initiated by the works operations.
5. The consequences of encountering or initiating ordnance.

### 19.2. Assessed Risk Level

1st Line Defence has assessed that there is an overall **Medium Risk** from items of Allied UXO at the site of proposed works. There is also an assessed **Low Risk** from German Air-Delivered UXO and Anti-Aircraft Projectiles.

| Ordnance Type                                 | Risk Level |     |        |      |
|-----------------------------------------------|------------|-----|--------|------|
|                                               | Negligible | Low | Medium | High |
| Allied Land Service and Small Arms Ammunition |            |     | ✓      |      |
| German Unexploded HE Bombs                    |            | ✓   |        |      |
| German 1kg Incendiary Bombs                   |            | ✓   |        |      |
| Anti-Aircraft Artillery Projectiles           |            | ✓   |        |      |

This report has been undertaken with due diligence, and all reasonable care has been taken to access and analyse relevant historical information. By necessity, when dealing historical evidence, and when making assessments of UXO risk, various assumptions have to be made which we have discussed and justified throughout this report. Our reports take a common-sense and practical approach to the assessment of risk, and we strive to be reasonable and pragmatic in our conclusions.

It should however be stressed that if any suspect items are encountered during the proposed works, 1st Line Defence should be contacted for advice/assistance, and to re-assess the risk where necessary. The mitigation measures outlined in the next section are recommended as a minimum precaution to alert ground personnel to the history of the site, what to look out for, and what measures to take in the event that a suspect item is encountered. It should also be noted that the conclusions of this report are based on the scope of works outlined in the 'Proposed Works' section of this report. Should the scope of works change or additional works be proposed, 1st Line Defence should be contacted to re-evaluate the risk.

## 20. Proposed Risk Mitigation Methodology

### 20.1. General

The following risk mitigation measures are recommended to support the proposed works at Colerne Industrial Estate:

| Recommended Risk Mitigation Measures                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Activity                                                                                 | Recommended Risk Mitigation Measure                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| All Works                                                                                | <ul style="list-style-type: none"> <li> <b>UXO Risk Management Plan</b><br/>           It is recommended that a site-specific plan for the management of UXO risk be written for this site. This plan should be kept on site and be referred to in the event that a suspect item of UXO is encountered at any stage of the project. It should detail the steps to be taken in the event of such a discovery, considering elements such as communication, raising the alarm, nominated responsible persons etc. Contact 1<sup>st</sup> Line Defence for help/more information.         </li> <li> <b>Site Specific UXO Awareness Briefings to all personnel conducting intrusive works.</b><br/>           As a minimum precaution, all personnel working on the site should be briefed on the basic identification of UXO and what to do in the event of encountering a suspect item. This should in the first instance be undertaken by a UXO Specialist. Posters and information on the risk of UXO can be held in the site office for reference.         </li> </ul>                                                                                                                                                                                                                                                                                                                             |
| Open Excavations<br>(trial pits, service pits, bulk excavations, strip foundations etc.) | <ul style="list-style-type: none"> <li> <b>Non-intrusive Magnetometer Survey and Target Investigation</b><br/>           A Non-Intrusive survey is undertaken using a man-portable magnetometer. Data is recorded and then interpreted to map magnetic fields and model discrete magnetic anomalies which may show the characteristics of UXO. The anomalies can then be investigated by a target investigation team. Where this type of survey is not practical (due to for example terrain or ground conditions), on-site UXO specialist support is instead recommended.         </li> <li> <b>Unexploded Ordnance (UXO) Specialist Presence on Site to support open excavations</b><br/>           When on site the role of the UXO Specialist would include:           <ul style="list-style-type: none"> <li>Monitoring works using visual recognition and instrumentation, including immediate response to reports of suspicious objects or suspected items of ordnance that have been recovered by the ground workers on site.</li> <li>Providing UXO awareness briefings to any uninformed staff and advise staff of the need to modify working practices to take account of the ordnance risk.</li> <li>To aid incident management which would involve liaison with the local authorities and police should ordnance be identified and present an explosive hazard.</li> </ul> </li> </ul> |

In making this assessment and recommending these risk mitigation measures, if known, the works outlined in the 'Scope of the Proposed Works' section were considered. Should the planned works be modified or additional intrusive engineering works be considered, 1st Line Defence should be consulted to see if a re-assessment of the risk or mitigation recommendations is necessary.

**1st Line Defence Limited**

**21/01/2026**

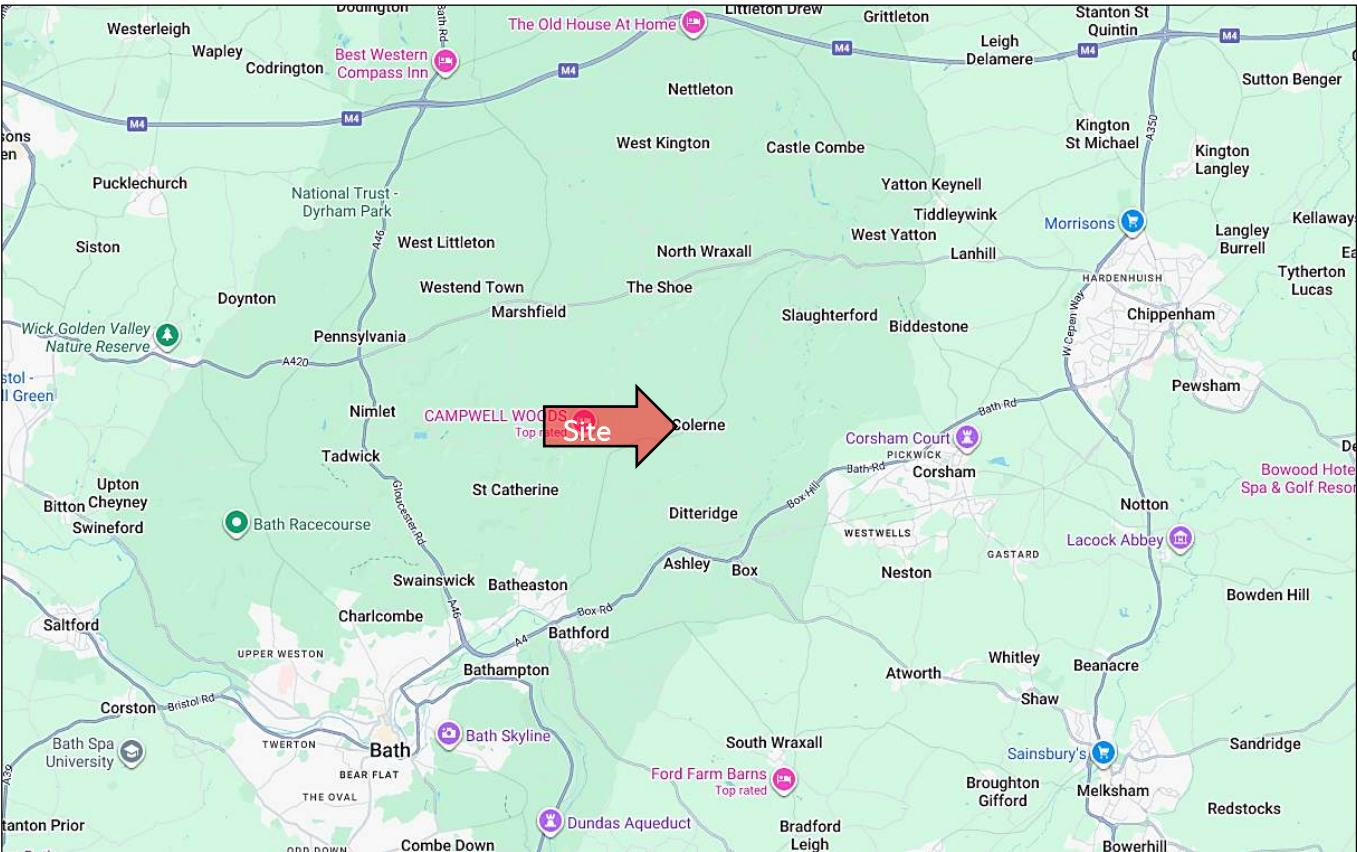
This Report has been produced in compliance with the Construction Industry Research and Information Association (CIRIA) C681 guidelines for the writing of Detailed UXO Risk Assessments.

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This report has been prepared by 1st Line Defence Limited with all reasonable care and skill. The report contains historical data and information from third party sources. 1st Line Defence Limited has sought to verify the accuracy and comprehensiveness of this information where possible but cannot be held accountable for any inherent errors. Furthermore, whilst every reasonable effort has been made to locate and access all relevant historical information, 1st Line Defence cannot be held responsible for any changes to risk level or mitigation recommendations resulting from documentation or other information which may come to light at a later date.

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Project: Colerne Industrial Estate

Ref: DA23079-00

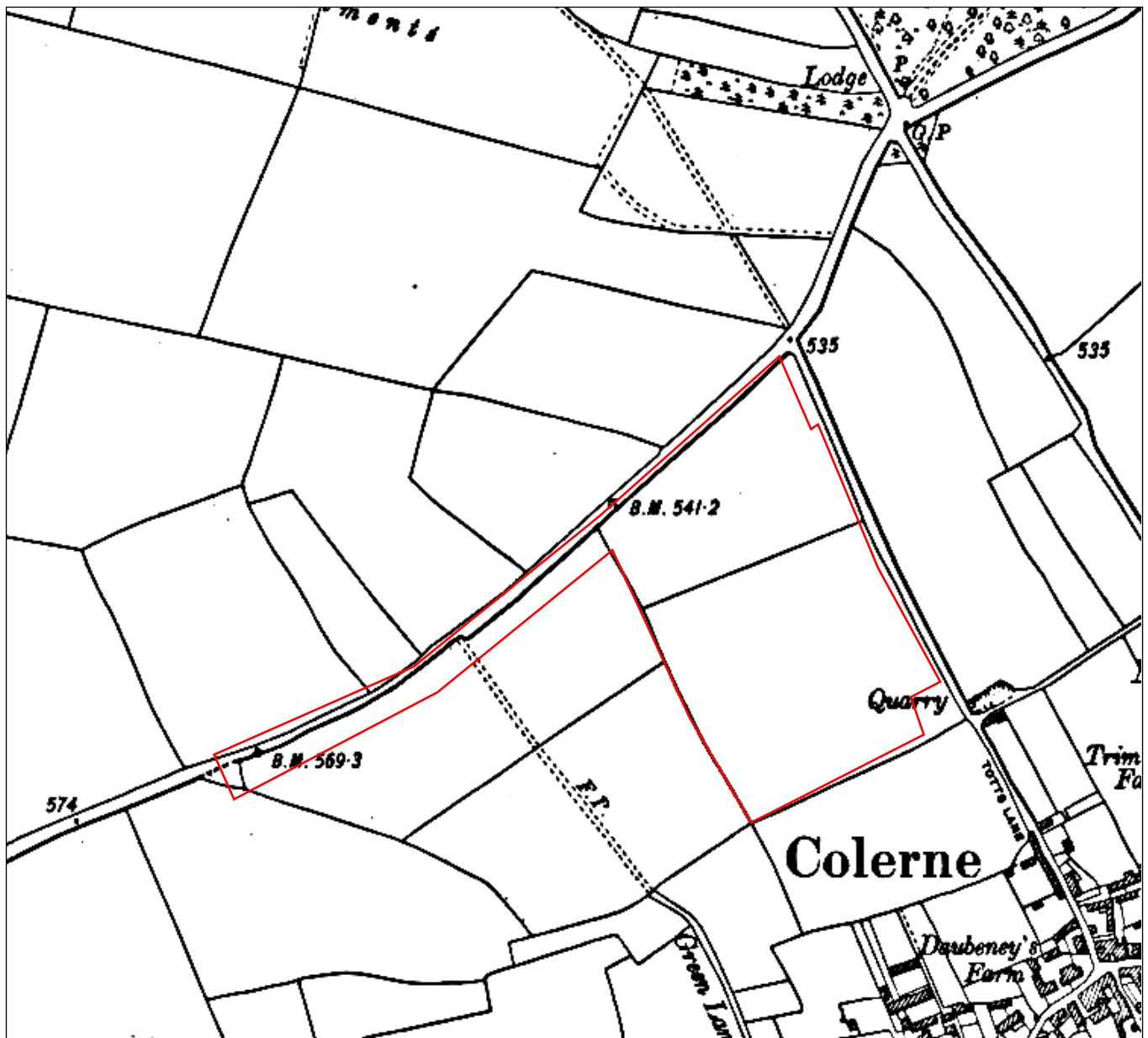
Source: Google Maps

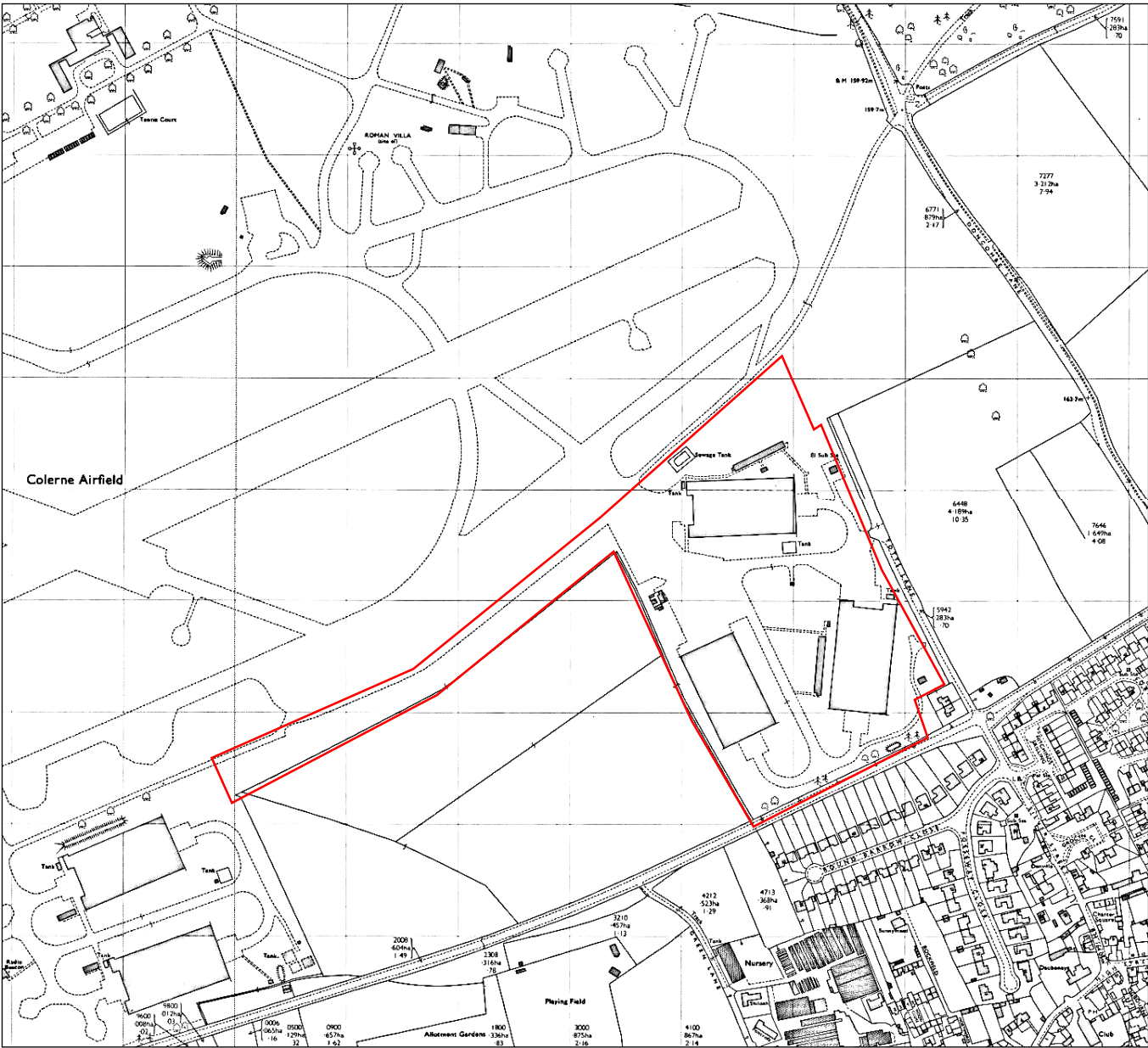
— Approximate Site Boundary













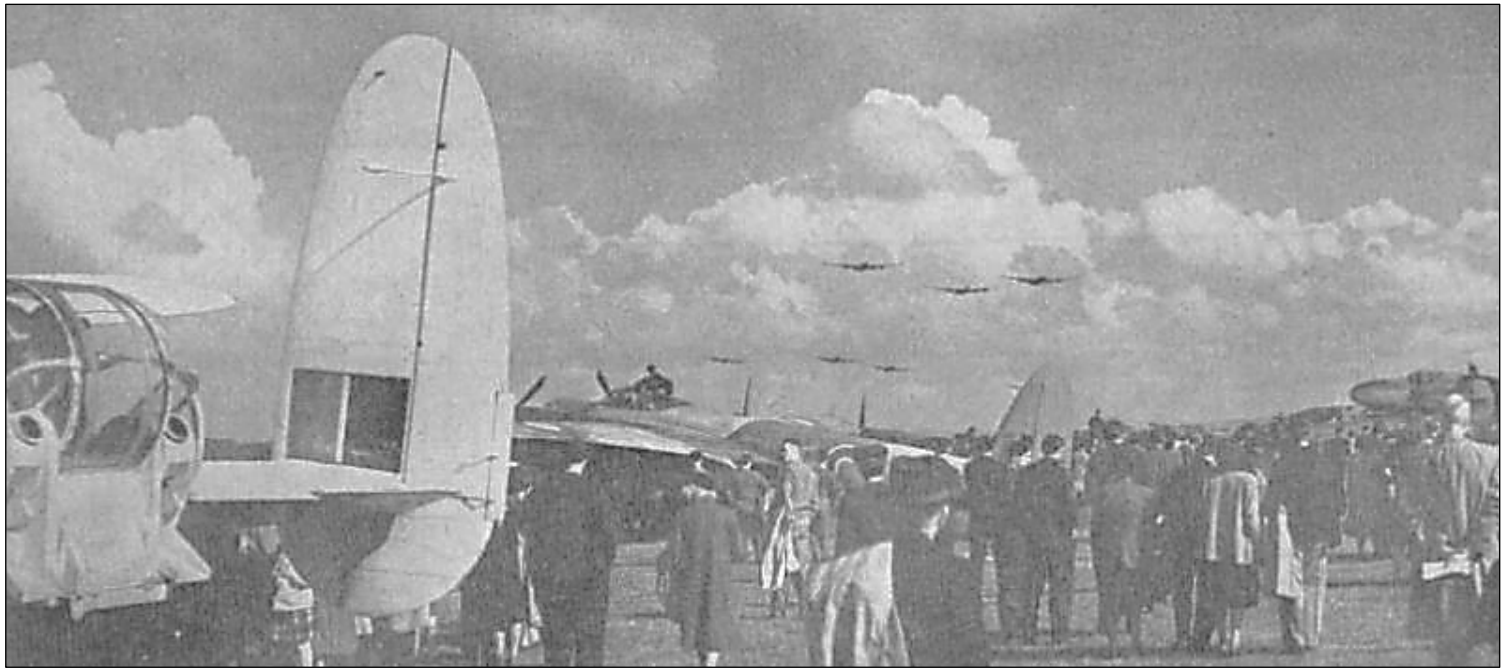
(Above) Hawker Hurricane touches down at RAF Colerne



(Above) Hawker Typhoon being serviced at RAF Colerne. Dummy bombs can also be seen, May 1943



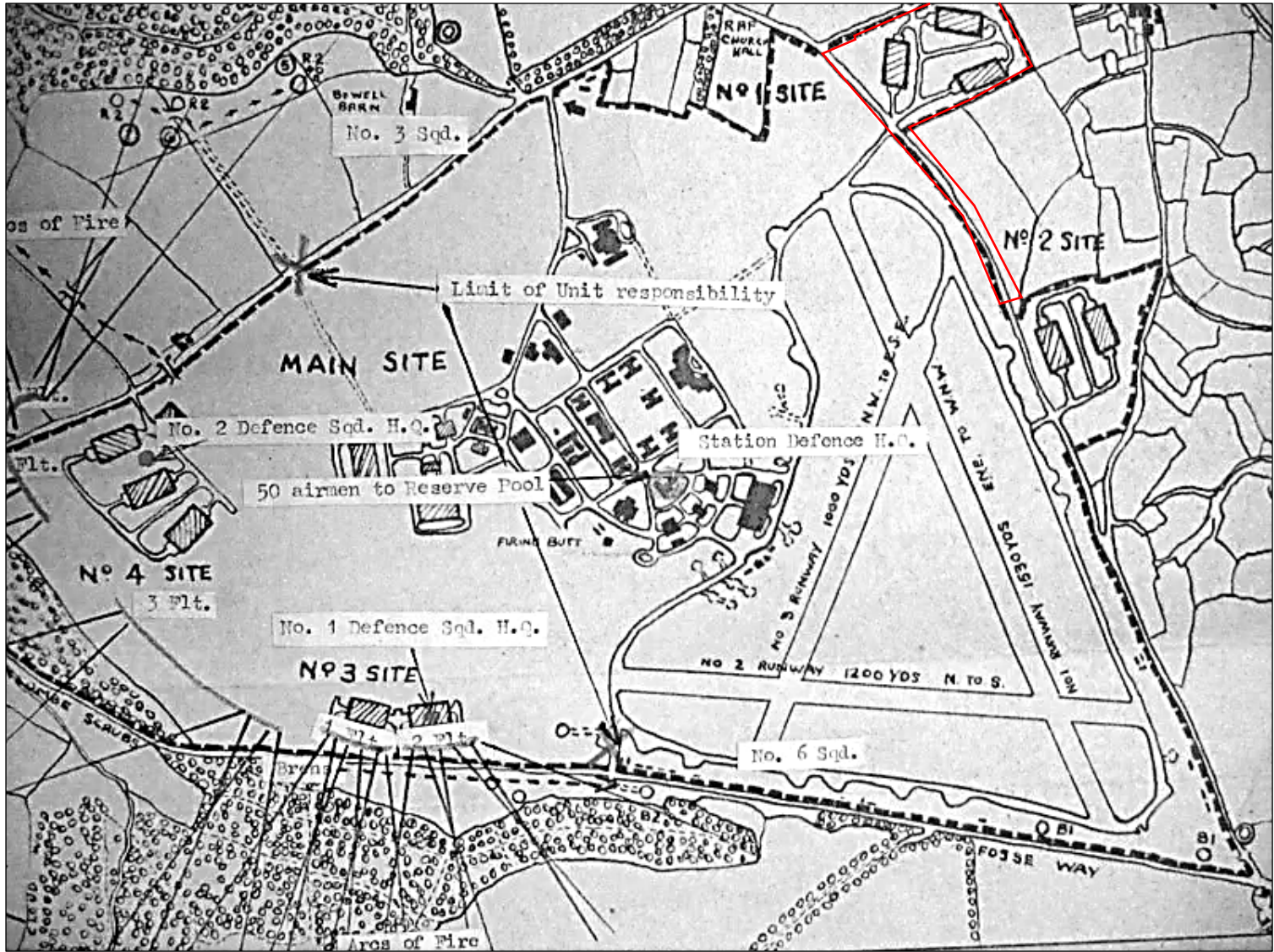
(Above) Westland Whirlwind Mk1 at RAF Colerne, 5<sup>th</sup> March 1942



(Above) Battle of Britain commemorations at RAF Colerne



(Above) Formation Flying over RAF Colerne, 1953



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Ref: DA23079-00

Source: RAF Museum, Hendon

— Approximate Site Boundary



Operations:

| Place | Date     | Time  | Summary of Events                                                                                                                                                                                                                                                                   | References to Appendices |
|-------|----------|-------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|
|       | 18.5.43. | 02.10 | About 30 Hostile aircraft crossed the South Coast on a fairly wide front and proceeded north through the Sector, making scattered raids in the South West and South Wales districts. JACKMAN 33 (W/Sgt. Kemp) 151 Squadron operating from Colerne destroyed a Ju.88 near MINCHHEAD. |                          |

RA.F. Form 540

See instructions for use of this form on KR and A.C.I.

Form 245 and War Manual Pt. II, Chapter XX and notes on R.A.F. Paper Book

OPERATIONS RECORD BOOK

of (Unit or Formation)STATION HEADQUARTERS, R.A.F. COLERNE.

Page No. 1

No. of pages used for day

| Place | Date   | Time  | Summary of Events                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | SECRET. | References to Appendices |
|-------|--------|-------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|--------------------------|
|       | 2.3.44 | 03.05 | Six aircraft (Mosquito XIII) of No. 151 Squadron were scrambled for Sopley - Durrington and Worth Matravers Control due to hostile raids approaching Beachy Head. "Lumber 63" of No. 151 Squadron - pilot W/C. G.H. Goodman & Nav/Radio F/O. W.F.E. Thomas destroyed 1 Ju.88 and 1 HE.177 under Sopley Control. This aircraft made an emergency landing at R.A.F. Station, Ford, being damaged by debris from exploding enemy aircraft and additionally the Navigator was injured. "Lumber 16" - pilot S/L. Harrison and Navigator - F/O. Horrocks also destroyed a Ju.188 under Worth Matravers Control and "Lumber 21" - pilot P/L. Stevens and Navigator - P/O. Aldridge also destroyed a Ju.88 under Durrington Control - both aircraft Of No. 151 Squadron. All the enemy aircraft were destroyed in Headquarters No. 11 Group Area. |         |                          |

| Place | Date    | Time | Summary of Events                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | SECRET. | References to Appendices |
|-------|---------|------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|--------------------------|
|       | 21.6.44 |      | Four Mosquito aircraft of No. 249 Squadron were scrambled for Long Load and Sector Control for hostile raids scattered over the Sector. Three contacts were made; but two of these were lost owing to "window" and the third contact developed into a stern chase across the Channel and which had to be broken off. There was thick mist over Colerne airfield when the aircraft returned from patrol and which made it necessary to divert them all to R.A.F. Station, Honiley. It was later learned that scattered bombs had been dropped in the vicinity of the Station at Bathaston, S. s. Very little damage resulted and there were no casualties. |         |                          |

Page No. 2

| Place | Date    | Time | Summary of Events                                                                                                                                   | SECRET. | References to Appendices |
|-------|---------|------|-----------------------------------------------------------------------------------------------------------------------------------------------------|---------|--------------------------|
|       | 6.6.44. | 0545 | "D" DAY (Continued)<br>All Mosquito aircraft which had been on patrol south of Cherbourg returned safely - the patrols being completely uneventful. |         |                          |



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|          |                                         |                                    |
|----------|-----------------------------------------|------------------------------------|
| Client:  | Earth Environmental & Geotechnical Ltd. |                                    |
| Project: | Colerne Industrial Estate               |                                    |
| Ref:     | DA23079-00                              | Source: The National Archives, Kew |

Station Defences/Exercises:

21793 Wt. 38805/3593 400.000 12/39-MOC & Co-51-5658

R.A.F. Form 540

See instructions for use of this form in K.R. and A.C.I., para. 2349, and War Manual, Pt. II, chapter XX., and notes in R.A.F. Pocket Book.

OPERATIONS RECORD BOOK

R.A.F. STATION, COLERNE, WILTS. (Unit or Formation)

Page No. 6

No. of pages used for day

| Place   | Date          | Time | Summary of Events                                                                                                                                                                                                                                | References to Appendices |
|---------|---------------|------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|
| COLERNE | OCT 31st 1940 |      | Military detachments co-operating in the Station Defence Scheme consisted of a detachment of the Staffordshire Regiment quartered in ASHWICKE PARK and a Section of two three inch A.A. Guns and one thirteen pounder field gun on the aerodrome |                          |

| Place   | Date     | Time | Summary of Events                                                     | References to Appendices |
|---------|----------|------|-----------------------------------------------------------------------|--------------------------|
| Colerne | 16.11.41 |      | Defence Exercise in conjunction with Home Guard held on the Station.. |                          |

21793 Wt. 38805/3593 400.000 12/39-MOC & Co-51-5658

R.A.F. Form 540

See instructions for use of this form in K.R. and A.C.I., para. 2349, and War Manual, Pt. II, chapter XX., and notes in R.A.F. Pocket Book.

OPERATIONS RECORD BOOK

R.A.F. STATION, COLERNE, WILTS. (Unit or Formation)

Page No. 1

No. of pages used for day

| Place | Date    | Time  | Summary of Events                                                                                                                             | References to Appendices |
|-------|---------|-------|-----------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|
|       | 3.9.42. | 22.00 | A successful "Bullseye" exercise was held when approximately 20 friendly bombers crossed the sector and a number of interceptions took place. |                          |

Aircraft Crashes/Incidents:

21793 Wt. 38805/3593 400.000 12/39-MOC & Co-51-5658

R.A.F. Form 540

See instructions for use of this form in K.R. and A.C.I., para. 2349, and War Manual, Pt. II, chapter XX., and notes in R.A.F. Pocket Book.

OPERATIONS RECORD BOOK

R.A.F. STATION, COLERNE, WILTS. (Unit or Formation)

Page No. 1

No. of pages used for day

| Place   | Date         | Time | Summary of Events                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | References to Appendices |
|---------|--------------|------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|
| COLERNE | 1942 October |      | Once again there has been no enemy activity in Colerne Sector for the month of October 1942.<br>On 2.10.42. at 12.25 hours, a Mosquito aircraft DD369 (Pilot: S/Ldr. P.T.Parsons and Radio Operator P/O P.A. Harding) (of 264 Squadron), when making a single engine landing, crashed into the doors of the Fighter Hangar. Both members of the crew were killed instantaneously. Fire immediately broke out, and fire fighting was in progress two minutes after the outbreak. A call over the Tannoy for assistance met with enthusiastic response from all personnel on the Station, and the Hangar was rapidly cleared of several aircraft and equipment. The fire was finally extinguished after a period of 45 minutes. |                          |

| Place | Date     | Time  | Summary of Events                                                                                                    | References to Appendices |
|-------|----------|-------|----------------------------------------------------------------------------------------------------------------------|--------------------------|
|       | 29.9.43. | 07.50 | Mosquito on Test crashed between Colerne Village and Airfield and burnt out, F/Lt. Griffin and Cpl. Blakeley killed. |                          |

| Place    | Date     | Time  | Summary of Events                                                                                                                                                                                                                                                   | References to Appendices |
|----------|----------|-------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|
| Colerne. | 9.10.43. | 15.30 | 1275328 Cpl. Shortland (Armourer) while destroying some 1940 "vintage" phosphorous bomb sustained while examining one bomb which had not exploded. Clothes in rage. 1st. & 2nd. degree burns of right side from face to ankle. Admitted St. Martins Hospital. Bath. |                          |

21793 Wt. 38805/3593 400.000 12/39-MOC & Co-51-5658

R.A.F. Form 540

See instructions for use of this form in K.R. and A.C.I., para. 2349, and War Manual, Pt. II, chapter XX., and notes in R.A.F. Pocket Book.

OPERATIONS RECORD BOOK

of (Unit or Formation) STATION SICK QUARTERS, COLERNE.

Page No. 1

No. of pages used for day

| Place    | Date    | Time | Summary of Events                                                                                                                                                                                                                                                    | References to Appendices |
|----------|---------|------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|
| Colerne. | 2.1.44. |      | F/Lt. Morgan posted to R.A.F. Colerne with No. 137 Squadron.<br>Mosquito crashed at the Eastern end of 2.0. runway, Sub. Lieut. Gramp and Sub. Lieut. Jeffray suffering from shock and minor abrasions, treated in Gras. Room and transferred to Sick Quarters. Box. |                          |



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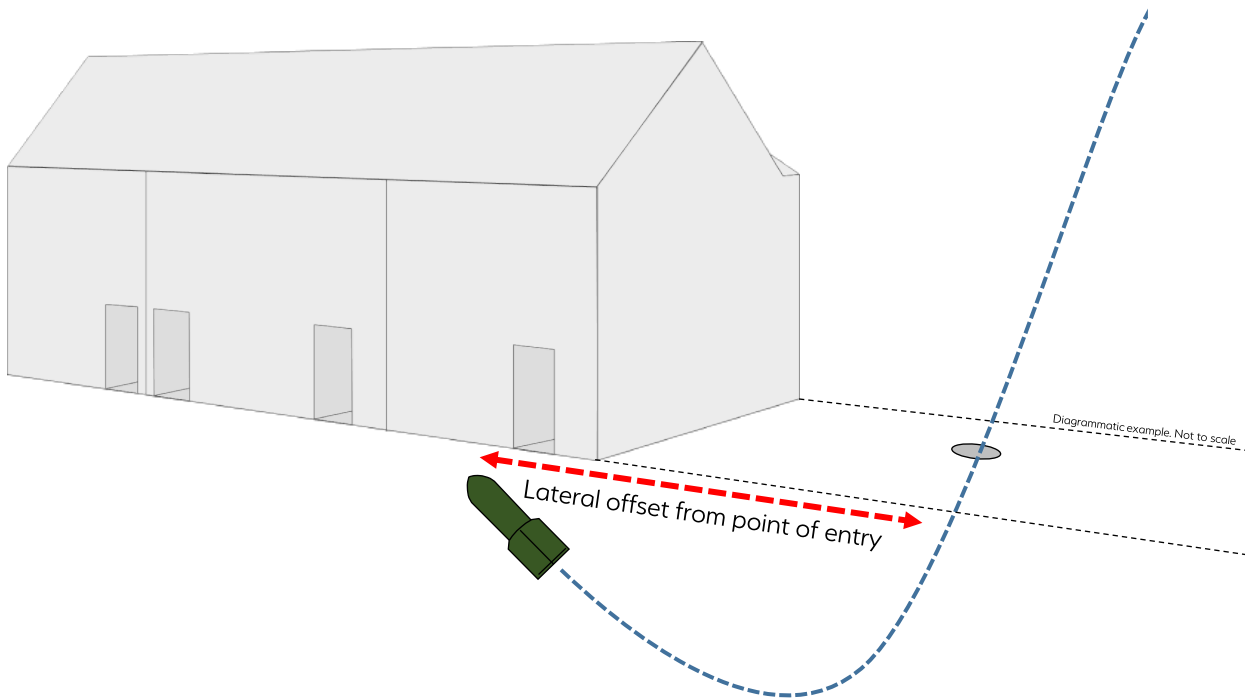
Project: Colerne Industrial Estate

Ref: DA23079-00

Source: The National Archives, Kew











**Top:** J-curve Effect - Due to angle of entry, unexploded bombs would often end their trajectory at a lateral offset from point of entry, often ending up beneath adjacent extant structures/sites.

The photograph **above** shows a 250kg unexploded bomb found in Bermondsey in 2015, pointing upwards, demonstrating 'J-curve'.

One of the most common scenarios for UXO going unnoticed was when a UXB fell into a 'bomb site' (such as the area shown **Top Left**), the entry hole of the bomb obscured by any debris and rubble present. Note that the entry hole of a 50kg UXB could be as little as 20cm in diameter (**Left**).



BBC

NEWS

### Bermondsey bomb: World War Two device safely removed



An unexploded World War Two bomb found in south London has been driven away safely under police and Army escort.

The 500lb (250kg) device was found on a building site in Grange Walk, Bermondsey on Monday.

Two primary schools were closed and hundreds of homes were evacuated as a precaution.

A cordon and 656ft (200m) exclusion zone was lifted at about 18:15 GMT as the bomb was removed to a quarry in Kent to be detonated, police said.

The Metropolitan Police force said the device was a 'SA' 250kg WWII German air-dropped bomb, known to the Army's Royal Logistic Corps bomb disposal experts.

250kg German HE Bomb, March 2015

BBC

NEWS

### WW2 bomb found near London City Airport blown up



An unexploded World War Two bomb found near London City Airport has been detonated.

The 500kg device was discovered at the King George V Dock on Sunday during planned work at the airport.

It was closed and all flights were cancelled on Monday after an exclusion zone was put in place.

The detonation, which took place off Shoeburyness, Essex, was postponed on Tuesday because of high winds and dangerous conditions for divers.

The 1.5m-long German bomb - which was found in a bed of silt, 15m underwater - was carefully removed from the Thames and placed in a secure location a mile away from the coast of Essex.

500kg German HE Bomb, February 2018

BBC

NEWS



### Exeter WW2 bomb is detonated after homes evacuated

More than 2,600 households and 12 university halls of residence were cleared before the 2,200lb (1,000kg) device was destroyed on Saturday.

Police said the blast left a crater about the size of a double-decker bus.

Police have reported large pieces of metal debris hitting buildings and said some properties in the 100m (330ft) exclusion zone had sustained "structural damage".



1000kg German HE bomb, February 2021

BBC

NEWS



### Great Yarmouth: Huge blast after unplanned WW2 bomb detonation

A World War Two bomb found in Great Yarmouth has detonated while work was being done to defuse it, causing a huge blast that was heard for miles.

Army specialists were attempting to disarm it when there was an unplanned detonation at about 17:00 GMT.

People on social media said they heard a loud bang and felt buildings shake 15 miles (24km) away.

There have been no reports of injuries among the Army, emergency services or the public, Norfolk Police said.

Cordons were put in place when the bomb was first discovered close to two gas pipes on Tuesday, and work began to make it safe.

250kg German HE Bomb, February 2023

BASF has confirmed that an explosive device, most likely a World War II-era bomb, caused the blast that left one person injured Tuesday at a plant construction site in Germany.

The explosion was reported at BASF's Ludwigshafen toluene diisocyanate (TDI) plant, which recently broke ground for a 300,000 metric tons per year TDI production plant and other construction to expand its facilities.



**BASF Provides Some Details**

Responding to a request from *PaintSquare News* for more information on Wednesday (Feb. 27), BASF's manager of media relations and corporate communications Europe, Ursula von Stetten, wrote in an email, "So here [are] the facts: The detonation took place at 10:00 a.m. One person was injured; the injury is not serious. He will be kept in the hospital for some days.

"Cause of the detonation was an explosive device, presumably a bomb deriving from the Second World War. The device detonated when grounding work was done. No details on [a] delay [are] available. At the moment, the exact circumstances of the incident are [being] evaluated."

1<sup>st</sup> March 2013

**SPIEGEL ONLINE**

**Blast Kills One**

**World War II Bomb Explodes on German Motorway**

A highway construction worker in Germany accidentally struck an unexploded World War II bomb, causing an explosion which killed him and wrecked several passing cars.



A World War II bomb has exploded during construction work on a German highway, killing one worker and injuring several motorists who were driving past, police said.

The worker had been cutting through the road surface near the south-western town of Aschaffenburg when his machine struck the bomb and triggered it. Police said they weren't sure yet what type of bomb it was. "The explosion seems to have been too small for it to have been an aircraft bomb," a police spokesman said.

23<sup>rd</sup> October 2006

**WWII bomb injures 17 at Hattingen construction site**



**Seventeen people were injured on Friday when a construction crew unwittingly detonated a buried World War II-era bomb in Hattingen.**

An excavator apparently drove over a 250-kilogramme (550 pound) American bomb, damaging surrounding buildings. Most of the injured suffered auditory trauma from the blast, and the excavator operator suffered injuries to his hands, police in the German state of **North Rhine-Westphalia** said.

"The hole was astoundingly small for such a large bomb full of so many explosives," Armin Gebhard, head of the Arnsberg department for military ordnance removal, told *The Local*. "But of course it damaged all the surrounding buildings too. We are really happy it wasn't worse."

19<sup>th</sup> September 2013

**BBC NEWS**

**World War II bomb kills three in Germany**



A special commission is investigating the causes of the explosion, while prosecutors are considering whether the team leader should face charges of manslaughter through culpable negligence, the BBC's Oana Lungescu reports from Berlin.

The blast happened an hour before the defusing operation was due to start.

Officials said the three men who died were experienced sappers, or combat engineers, who over 20 years had defused up to 700 bombs.

More than 7,000 people were immediately evacuated when the 500kg bomb was found. Several schools, a kindergarten and local companies remain closed.

2<sup>nd</sup> June 2010



June 2006

BBC

NEWS

Unexploded WW1 artillery shell found in Newark



An unexploded World War One artillery shell has been found in a river by a marina worker.

James Wilkinson, who works at Newark Marina in Nottinghamshire, was dredging the water at about 11.00 GMT when he uncovered the device.

A specialist bomb disposal unit carried out a controlled explosion to detonate the 18lb and 3in long "highly explosive" device.

Kirby residents react after grenade is detonated on housing estate



Residents react after wartime grenade 'with pin still in it' is detonated on housing estate

Essex Police officers were called to the Taylor Wimpey housing development in Thorpe Road, Kirby Cross, after the 70 plus-year-old hand grenade was discovered.

YORKSHIRE POST

Army called after unexploded WW2 shell found in village near Ilkley



Police have released photos of an old wartime mortar shell that was found in a rural Yorkshire village.

Army bomb disposal experts from the Royal Logistics Corps were called to Addingham, near Ilkley, yesterday to make the device safe.

Evening News

Police warning after discovery of unexploded mortar shell in Glossop moorland



This unexploded mortar shell was found on moorland above Glossop

The force said officers were alerted to the large metal shell on Saturday (February 20) by a member of the public.

It was identified by experts as an unexploded mortar shell, which the force described as 'very dangerous and unusual'.

Express & Star

Dozens more mortar shells found during work on Burntwood housing estate



A large number of mortar shells have been discovered on a building site in Burntwood forcing businesses to evacuate.

The shells were found by Staffordshire Police on the site near Milestone Way in Chasetown, and a 200m (656ft) cordon was soon after put in place.

Members of the public are being advised to stay away from the area near Morrisons supermarket while police deal with the shells.

Developers Taylor Wimpey and Barnatt Homes were behind the plans to build 150 homes at Milestone Way.

Unexploded WW2 bomb found at Kenfig Pool, Bridgend



Bomb experts have been called to a south Wales nature reserve after an unexploded World War Two shell was discovered by a walker in Bridgend.

Dean Smith, 38, of Pyle, was walking near Kenfig Pool on Saturday when he saw a fin sticking out of the sand.

He reached down to pick it up, but ending up falling and landed with the 2ft-long (0.6m) bomb on top of him.

The site has been cordoned off by police and the Royal Logistics Corps will carry out a controlled explosion.

Swindon Advertiser

Worker on old school site in Swindon finds buried explosives



At around 9.30am, the digger rubbed against the lid of something which was approximately 600mm below ground - and would have blown up instantly if broken.

AW Bombs are yellow phosphorous hand grenades in half pint clear glass bottles weighing 1.5lbs each, which ignite instantly once their liquid contents react with the outside air.

deadline.

Locals on Isle of Wight find 1ft long unexploded WW2 bomb



AN UNEXPLODED World War Two bomb has been discovered by locals on the Isle of Wight.

Bomb disposal experts were deployed to the B3323 in Shorwell, after police arrived and identified the dangerous device.

SuffolkNews

Icklingham mortar bomb is blown up by Army



Police had to guard an unexploded WW2 4in calibre mortar bomb overnight in a field near Icklingham until Army bomb disposal could blow it up on Tuesday.

The bomb had been found by farmworkers using a digger at about 2.50pm on Monday but by the time the Regiment Royal Logistic Corps 621 Squadron, 11 Explosive Ordnance Disposal, from Colchester, had examined it it was too dark to carry out a controlled explosion.

# Army to detonate wartime bomb

Saturday, February 14, 1998 Published at 23:27 GMT

A World War Two bomb that has forced hundreds of people to be evacuated from their homes in Chippenham, Wiltshire, is to be detonated by Army bomb disposal experts.

The public were warned that the blast, which will be carried out under controlled conditions, could cause some damage to surrounding houses in the town.

The decision to detonate the 750kg bomb was taken after police and Army experts decided that continued efforts to defuse it would take too long.

Poor conditions made the operation almost impossible. The bomb, discovered on a building site, has remained buried in water-logged clay.

Superintendent Ian Maidment from Wiltshire Police announced there was no other option than a controlled explosion.

"The decision was made following specialist advice from bomb disposal experts who say it is impossible to immobilise the bomb in its current situation," he said.

Around 1,100 people are now facing a second night in emergency shelters or at the homes of relatives.

The unexploded bomb was one of two wartime devices discovered on the building site on Friday.

After part of the town was cordoned off, Army experts were called in to deal with the explosive devices.



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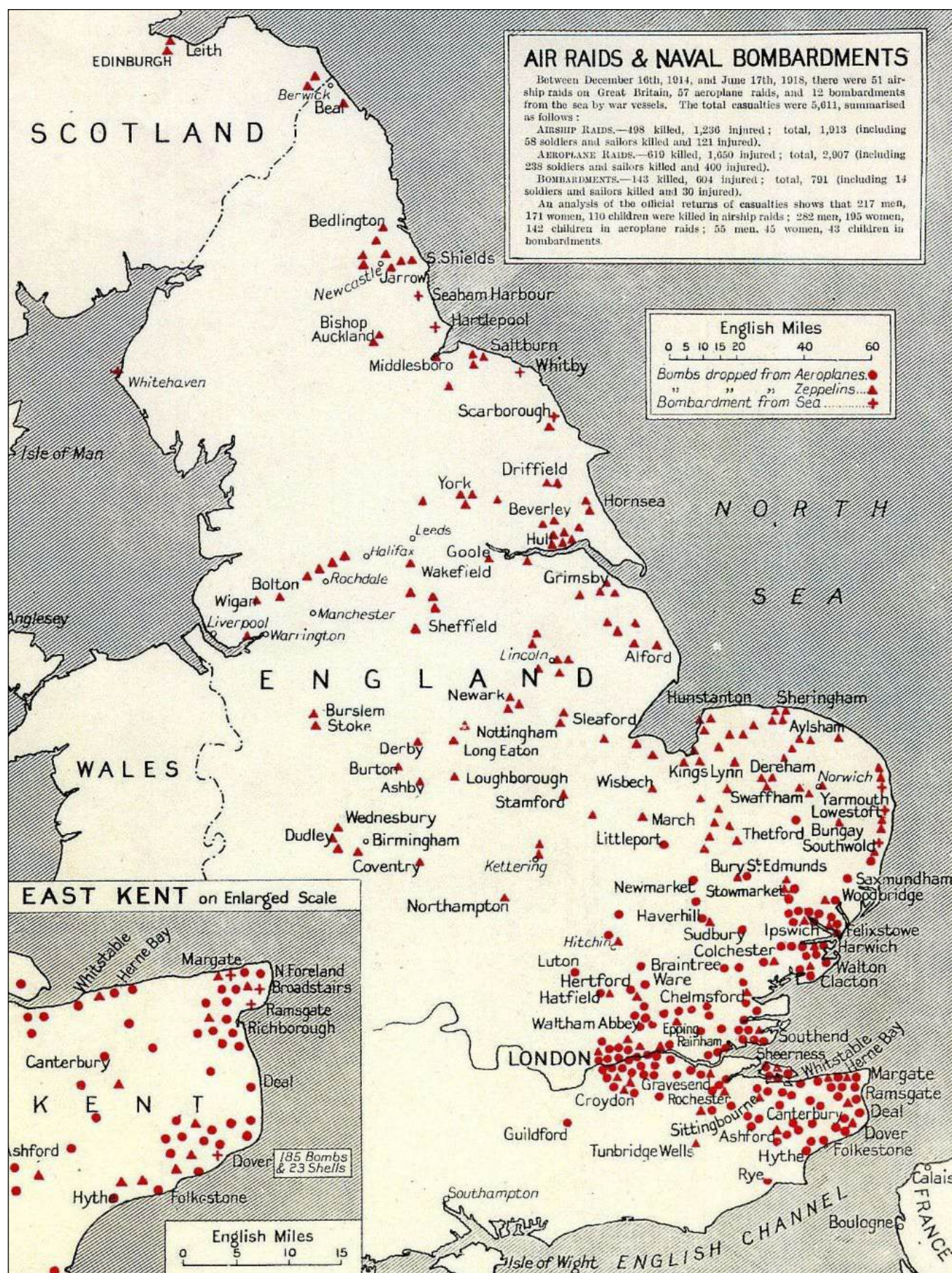
Project: Colerne Industrial Estate

Ref: DA23079-00

Source: BBC News

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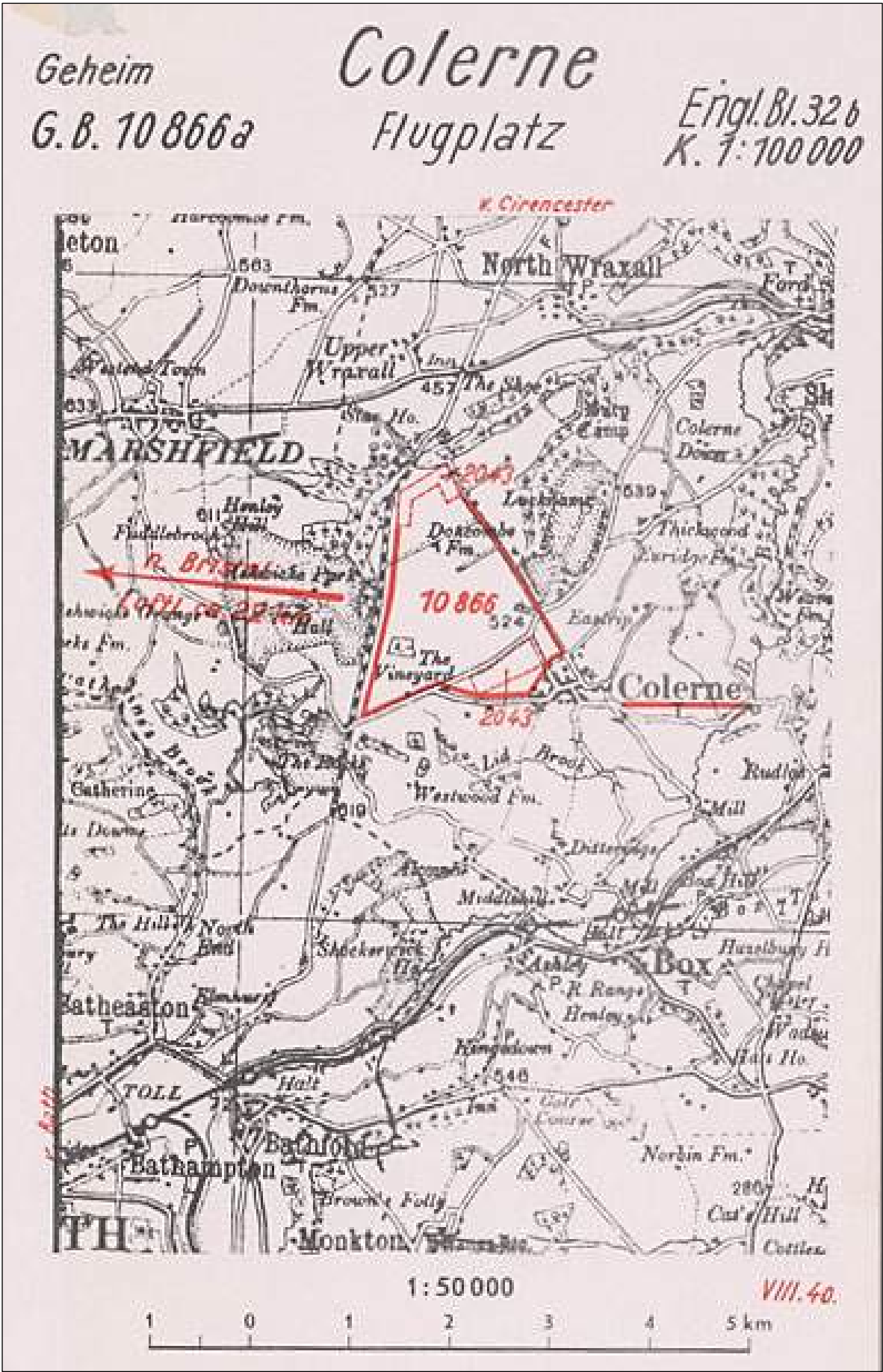
Ref: DA23079-00

Source: J. Morris, German Air Raids on Britain

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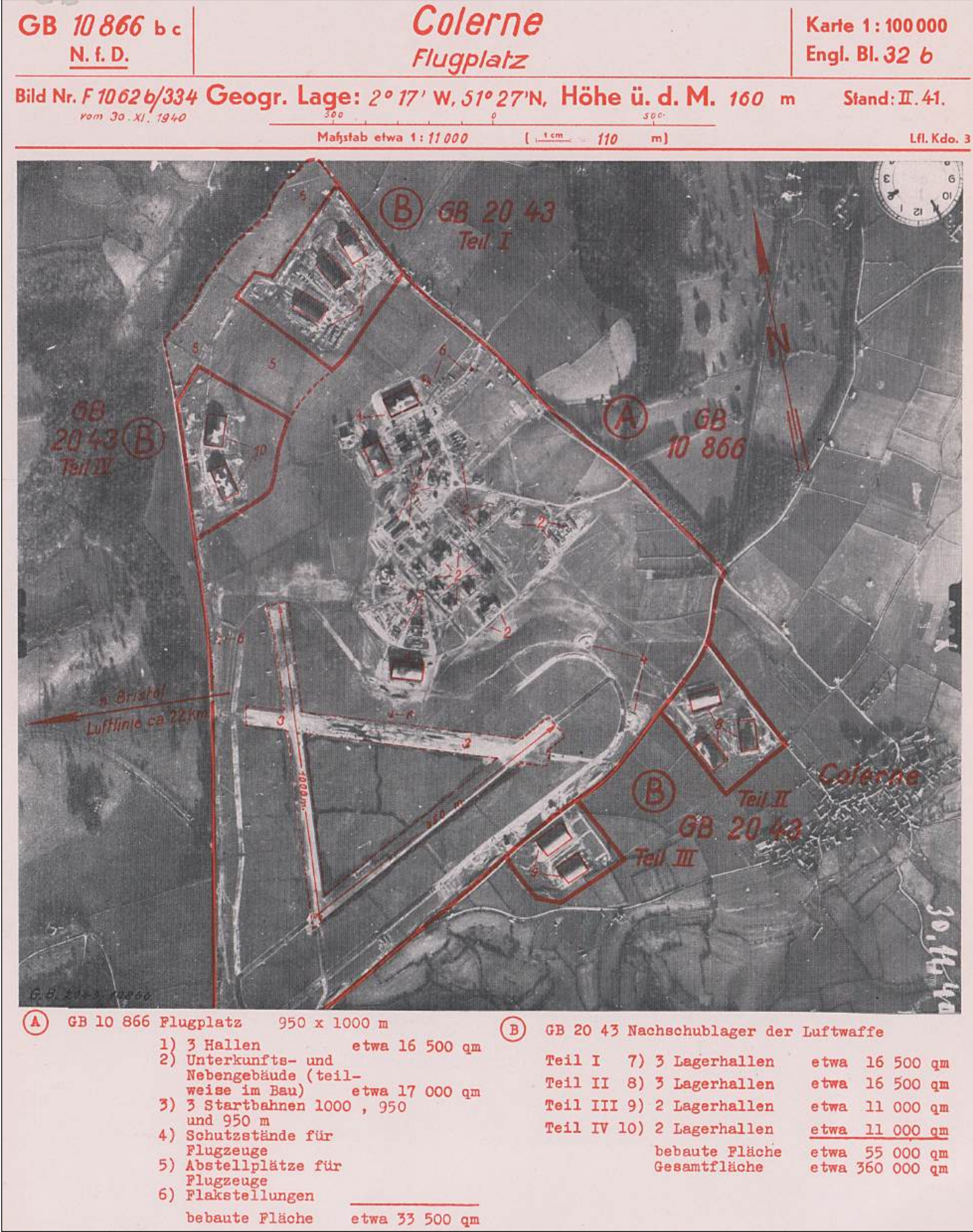
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SECRETDAILY SUMMARY NO. 44 13/9/40.Period 1800/12/9/40 to 1800/13/9/40.CIVIL DEFENCE  
Office of the Regional Commissioner.Colerne 6 miles W. of Chippenham at 1530/12/9 1 HE  
and 1 I.B.SECRET.19th September 1940.CIVIL DEFENCE.Office of the Regional Commissioner.DAILY SUMMARY NO. 50.Period 1800/18.9.40 to 1800/19.9.40.Colerne.Lucknam Park. 6 miles S.W. of Chippenham.  
2135/18/9. 4 H.E.SECRET19th November. 1940.CIVIL DEFENCEOffice of the Regional CommissionerDAILY SUMMARY NO. 111Period 1200/18/11/40 to 1200/19/11/40.

COLERNE: 0400/18/11 1 Uxb.

SECRET11th. APRIL 1941.CIVIL DEFENCEOffice of the Regional CommissionerDAILY SUMMARY NO. 226Period 1200/10/4/41 to 1200/11/4/41.COLERNE: 6 miles W. CHIPPENHAM at 0200/10/4. 3 H.E. on Air  
Ministry land.**1ST LINE DEFENCE**Unit 3, Maple Park,  
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Source: Somerset Heritage Centre

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SECRET.

4th May 1941.

CIVIL DEFENCE.

Office of the Regional Commissioner.

DAILY SUMMARY no245.

Period 1200/3/5/41 to 1200/4/5/41.

PART 1. A number of minor incidents have been reported, mainly from rural areas but little damage was caused and there were no casualties.

WILTS. COLERNE at Hunters Hall, County Boundary, at 2250/3/5 - several I.E.s all dealt with. No damage.

SECRET.

12th May 1941.

CIVIL DEFENCE

Office of the Regional Commissioner.

DAILY SUMMARY No.253

Period 1200/11/5/41 to 1200/12/5/41.

WILTS. COLERNE: 6½ miles W.S.W. Chippenham at 0218/12/5 - 3 H.E. of heavy calibre in fields near Colerne - Box road. No damage.

CONFIDENTIAL.

27th April 1942.

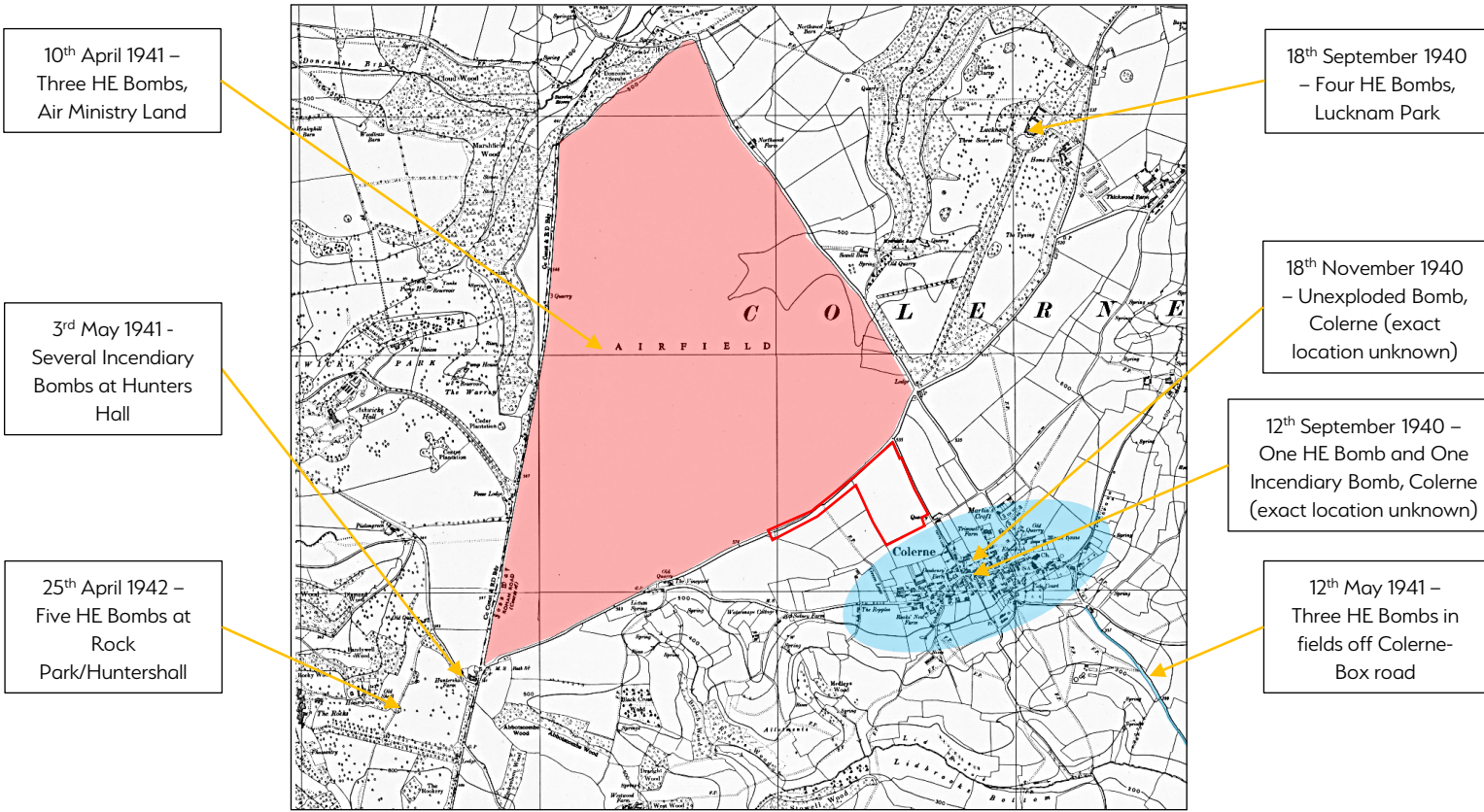
CIVIL DEFENCE.

Office of the Regional Commissioner.

DAILY SUMMARY NO. 354.

Period 1200/26/4/42 to 1200/27/4/42.

MARSHFIELD. 2½ miles S.S.E. of, at ROCK PARK, HUNTERS HALL, at 2310/25/4. 5 H.E. Slight damage to farm and telephone wires. No casualties.



21793 W1 38805/3593 400 000 12/38-MCC & Co-51-5658

R.A.F. Form 540

See instructions for use of this form in K.R. and A.C.I., para. 2549, and War Manual, Pt. II., chapter XX., and notes in R.A.F. Pocket Book.

OPERATIONS RECORD BOOK

Page No. ....

of (Unit or Formation).....Station Headquarters, Colerne.....

No. of pages used for day .....

| Place | Date                  | Time  | Summary of Events                                                                                         | References to Appendices |
|-------|-----------------------|-------|-----------------------------------------------------------------------------------------------------------|--------------------------|
|       | 1941<br><u>APRIL.</u> |       |                                                                                                           |                          |
|       | 10th.                 | 0230. | 3 x 50 Kilogram Bombs dropped on the Aerodrome between the Main and temporary Landing Grounds, no damage. |                          |

21793 W1 38805/3593 400 000 12/38-MCC & Co-51-5658

R.A.F. Form 540

See instructions for use of this form in K.R. and A.C.I., para. 2549, and War Manual, Pt. II., chapter XX., and notes in R.A.F. Pocket Book.

OPERATIONS RECORD BOOK

Page No. ....

of (Unit or Formation).....R.A.F. Station, Colerne.....

No. of pages used for day .....

| Place    | Date             | Time  | Summary of Events                                                                                                                                                                                                              | References to Appendices |
|----------|------------------|-------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|
|          | <u>MAY.</u> 1941 |       |                                                                                                                                                                                                                                |                          |
| COLERNE. | 3rd.             | 23-30 | A number of Incendiary bombs were dropped on the Western side of the Aerodrome by an enemy Aircraft, no damage. Also 2 x 250 Kilogram bombs fell about 200 yards from the South West corner of the Aerodrome, both unexploded. |                          |

21793 W1 38805/3593 400 000 12/38-MCC & Co-51-5658

R.A.F. Form 540

See instructions for use of this form in K.R. and A.C.I., para. 2549, and War Manual, Pt. II., chapter XX., and notes in R.A.F. Pocket Book.

OPERATIONS RECORD BOOK

Page No. ....

of (Unit or Formation) R.A.F. Station, COLERNE and satellite aerodrome,  
CHARLEY DOWN.

No. of pages used for day .....

| Place   | Date | Time | Summary of Events                                                                                                                                                                                                                                                                                                                                                                                              | References to Appendices |
|---------|------|------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|
| Colerne |      |      | The month of April 1942 has again been until towards its end very quiet, when the comparative peace of recent months was ended by the violent bombing attacks on Bath, which occurred on the nights of the 25th and 26th. The station was not affected further than that some corrugated sheeting on a Nissen hut was moved by one of a stick of bombs dropped from Hunter's Hall to the grounds of the Rocks. |                          |



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