



Norwich Western Link

Environmental Statement Chapter 13: Geology and Soils

Appendix 13.1: Interpretative Environmental Desk Study Report

Sub Appendix H: Unexploded Ordnance Assessment Part 1 of 3

Author: WSP

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1 Introduction

- 1.1.1 This Preliminary Assessment is designed to inform environmental and construction professionals of the potential threat of military related explosives and/or ordnance on, or in, the vicinity of the Study Site.
- 1.1.2 During WWII, the Study Site was situated within St Faiths & Aylsham Rural District, which recorded one High Explosive (HE) Bomb strike per 100 hectares; a very low level of bombing.
- 1.1.3 Luftwaffe aerial reconnaissance photography associated with the Site identified an airfield (875m south-west) as a primary bombing target.
- 1.1.4 Further research identified this airfield as Royal Air Force (RAF) Attlebridge (located 920m south-west) which was active between 1941-1956. Its primary purpose was originally as a satellite station, before then being extended to accommodate RAF and American Air Force heavy bomber groups and their training.
- 1.1.5 Air Raid Precaution (ARP) records did not identify any HE bomb strikes within the Site, however one was located 605m south-west of the Site boundary.
- 1.1.6 Official bomb damage was not available. In addition, an analysis of post-war mapping and further research did not identify any evidence of potential bomb damage on-site or within the vicinity.
- 1.1.7 Despite an airfield being located within the area during WWII, there is no evidence to suggest that further investigation into UXO is warranted.
- 1.1.8 We have included a summary of key information shown in this document in an accessible format in section 1.1.1. However, some users may not be able to access all technical details that are included in the rest of this document. If you require this document in a more accessible format, please contact norwichwesternlink@norfolk.gov.uk

PRELIMINARY UNEXPLODED ORDNANCE (UXO) THREAT ASSESSMENT

Meeting the requirements of CIRIA C681 'Unexploded Ordnance (UXO) – A guide for the Construction Industry' Risk Management Framework



6 ALPHA PROJECT NUMBER	P7198	ORIGINATOR	B. Wilkins
LANDMARK ORDER NUMBER	194238740_1	REVIEWED BY	C. Cole (18 th February 2019)
CLIENT REFERENCE	NWL Line 1	RELEASED BY	R. Griffiths (18 th February 2019)
SITE	Site at 609837, 315255		
RECOMMENDATION	This Site requires a Detailed UXO Threat and Risk Assessment		

STUDY SITE

The Study Site is described as “Site at 609837, 315255”, and it is centred on National Grid Reference 609740, 315280.

THREAT POTENTIAL AND RECOMMENDATIONS

The potential for a UXO hazard to occur, and more specifically, the potential for unexploded WWI and WWII ordnance to exist at this site is assessed as being **LIKELY** (*Figure 2*).

In accordance with *CIRIA C681* Chapter 5 on managing UXO risks, *6 Alpha* recommends that the next stage in the risk management framework is:

DETAILED UXO THREAT & RISK ASSESSMENT

We would be pleased to provide this service, please contact *Envirocheck* for further details:



REPORT SUMMARY

During WWII, the Study Site was situated within *St Faiths & Aylsham Rural District* and *Mitford & Launditch Rural District*, which both recorded one High Explosive (HE) bomb strike per 100 hectares; a very low level of bombing.

Luftwaffe aerial reconnaissance photography associated with the Site identified an airfield (on-site, 135m east and 200m east) as a primary bombing target.

Further research identified this airfield as *Royal Air Force (RAF) Attlebridge* (on-site) and was active between 1941-1956. It's primary purpose was originally a satellite station, which then extended to accommodate *RAF* and *American Air Force* heavy bomber groups and their training.

Air Raid Precaution (ARP) records did not identify any HE bomb strikes within the Site. However, two unknown bombs were identified 415m east and 980m east.

Official bomb damage mapping was not available. Additionally, further research did not identify any evidence of bomb damage within 1,000m of the Site.

Given that *RAF Attlebridge* was located on-site; it would suggest that further action is warranted to address the potential for UXO encounter.

USING THIS REPORT

This Preliminary Assessment is designed to inform environmental and construction professionals of the potential threat of military related explosives and/or ordnance on, or in, the vicinity of the Study Site.

This assessment is designed to be employed as a site-screening tool to meet with the requirement of Phase One of the *CIRIA UXO Risk Management Framework*; there are two broad prospective outcomes; either the threat level requires a detailed threat & risk assessment; or no further action is required. In the former instance we can provide a report within 10 working days (or more quickly upon application).

Two figures accompany the report, the *Second World War (WWII)* High Explosive (HE) Bomb Density and the final Probability of UXO Encounter. The purpose of this approach is to demonstrate that whilst bomb density statistics give an indication for WWII bombing, they should not be relied upon exclusively to generate a holistic assessment.












For further information, please contact *Envirocheck*:

Telephone: +44 (0)844 844 9952

Website: <http://www.envirocheck.co.uk>

Email: customerservice@envirocheck.co.uk

DATA FINDINGS

Threat Source (within 1,000m)	Detail	
	Identified	Comments
 Airfields/Military Facilities	✓	RAF Attlebridge (on-site).
 Ordnance Manufacture/Storage	✗	None recorded within 1,000m.
 WWII Decoy Bombing Sites	✗	None recorded within 1,000m.
 WWII Defensive Features	✓	Spigot Mortar Emplacement (155m north-west).
 WWII <i>Luftwaffe</i> Designated Bombing Targets	✓	<i>Luftwaffe</i> aerial photography identified an airfield (on-site, 135m east and 200m east) as a primary bombing target.
 WWII Bomb Strikes Within Site Boundary	✗	ARP records did not identify any HE bomb strikes on-site.
 WWII Bomb Strikes Near Site Boundary	✓	ARP records identified two unknown bombs; 415m east and 980m east.
 WWII Bomb Damage	✗	Official bomb damage mapping was not available.
 Abandoned Bomb Register	✗	The official abandoned bomb list did not identify any abandoned bombs located within 1,000m.
 Potential Threat Sources	✓	The most probable UXO threat is posed by LSA/SAA/AXO associated with former RAF sites.
 WWII Bombing Density Per 100 Hectares	✓	<i>St Faiths & Aylsham Rural District</i> and <i>Mitford & Launditch Rural District</i> , which both recorded one HE bomb strike per 100 hectares.

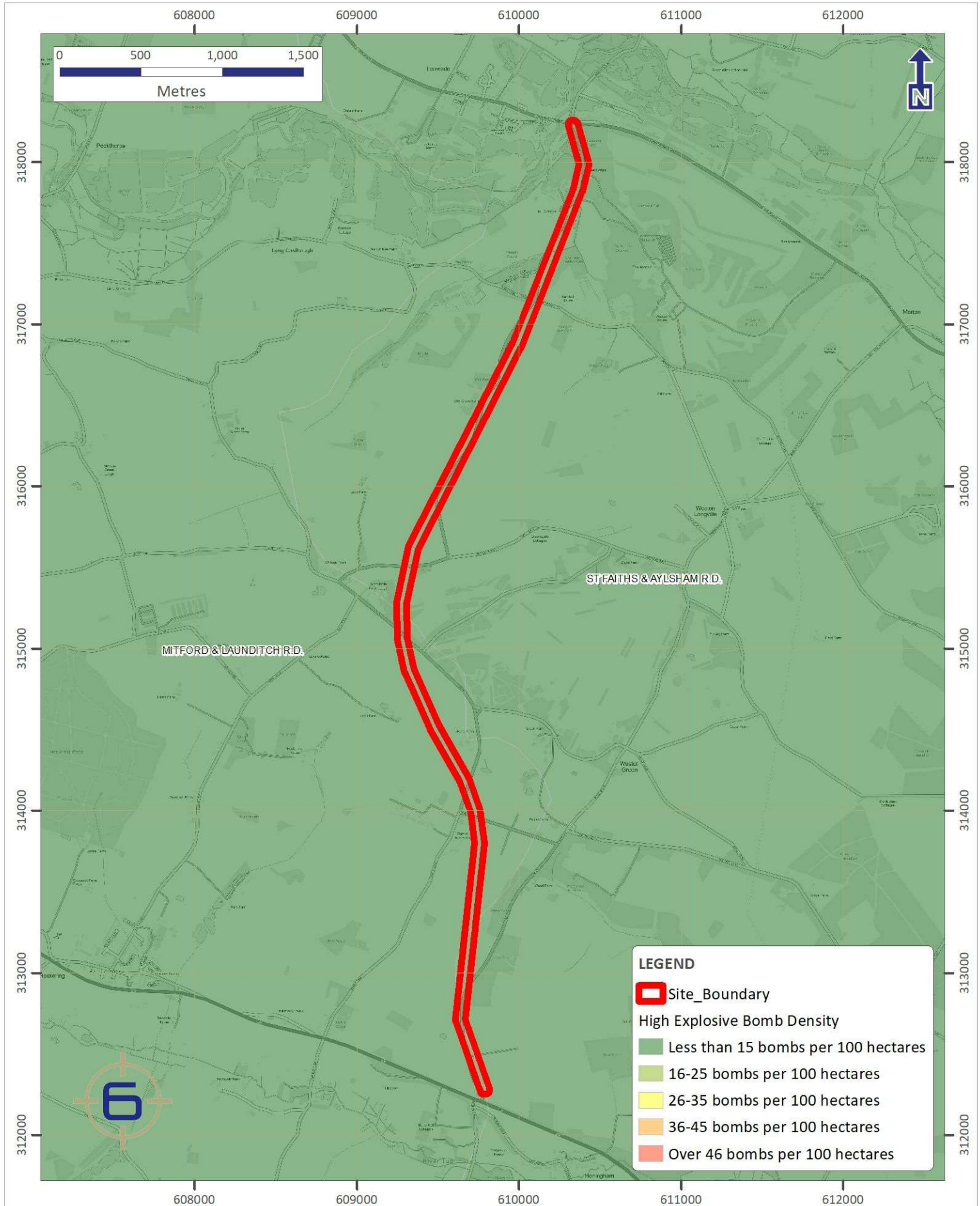
IMPORTANT NOTES

1. The term 'Preliminary UXO Threat Assessment' has been used to describe this report, to fall in line with the CIRIA C681 guidelines. Whilst the term 'Risk' can be justifiably used at this stage, the reader should note that the 'Consequence' function of 'Risk' is not considered. Should it be required, this would be addressed in the 'Detailed UXO Threat & Risk Assessment' (Stages 2 and 3).
2. This report is accurate and up to date at the time of writing.
3. The assessment levels have been generated from historical data and third party sources. Where possible 6 Alpha have sought to verify the accuracy of such data, but cannot be held accountable for inherent errors that may be in third party data sets (e.g. *National Archives* or library sources).
4. 6 Alpha have exercised all reasonable care, skill and due diligence in producing this service.
5. Whilst every effort has been used to identify all potential UXO/explosive threats, there were a number of private facilities, which may not have released privately recorded information concerning UXO/explosive threats into the public domain. It is therefore possible that some of the aforementioned sites may not be included within the database.



SITE AT 609837,315255

WWII High Explosive Bomb Density



LEGEND

- Site_Boundary
- High Explosive Bomb Density
- Less than 15 bombs per 100 hectares
- 16-25 bombs per 100 hectares
- 26-35 bombs per 100 hectares
- 36-45 bombs per 100 hectares
- Over 46 bombs per 100 hectares

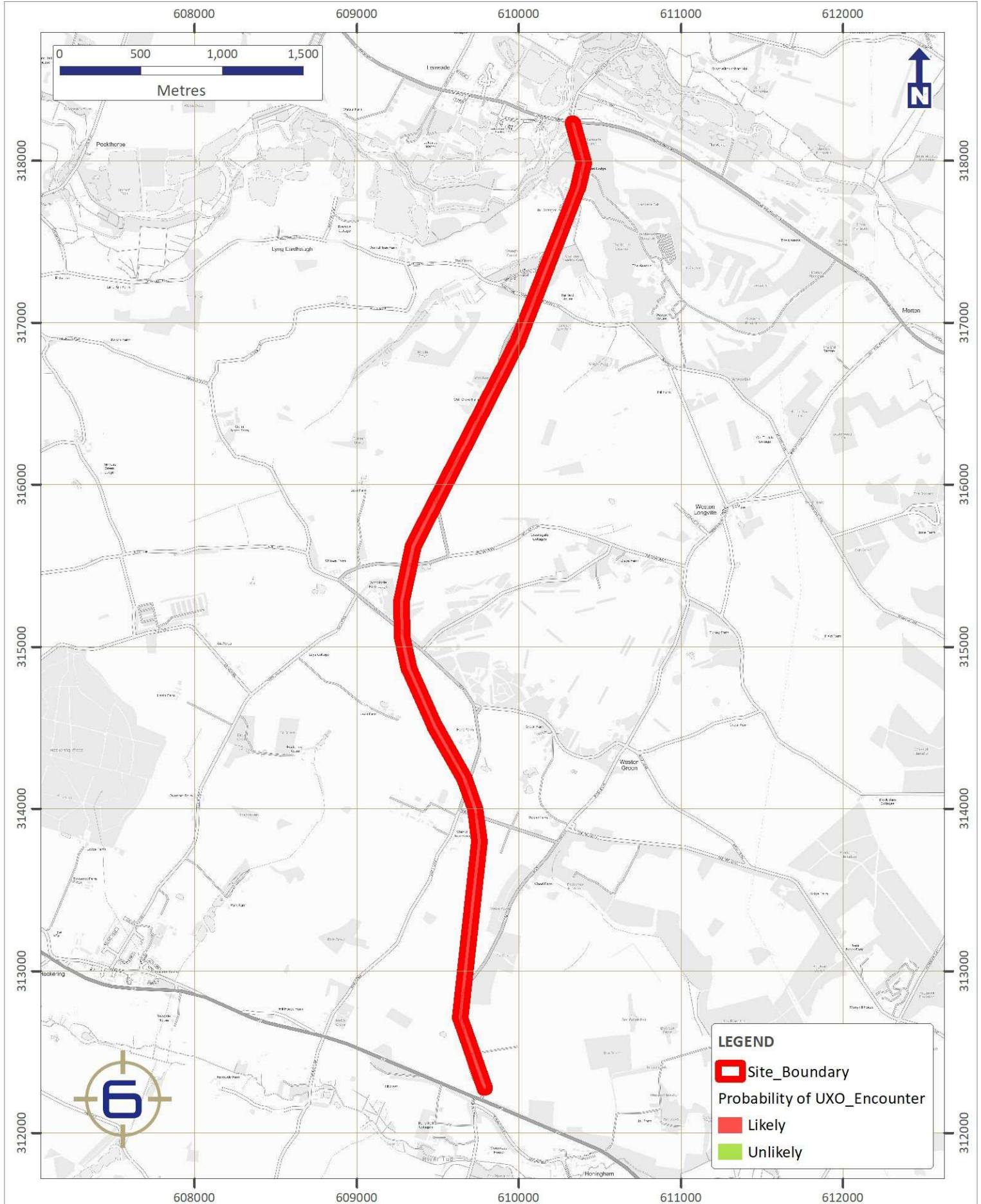
PROJECT NO. P7198	FIGURE 1	DRAWN BL	CHECKED CC	DATE 15 February 2019	Contains Ordnance Survey data © Crown copyright and database right 2017	Produced by and Copyright to 6 Alpha Associates Ltd. Users noting any errors please notify 6 Alpha.	
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SITE AT 609837,315255



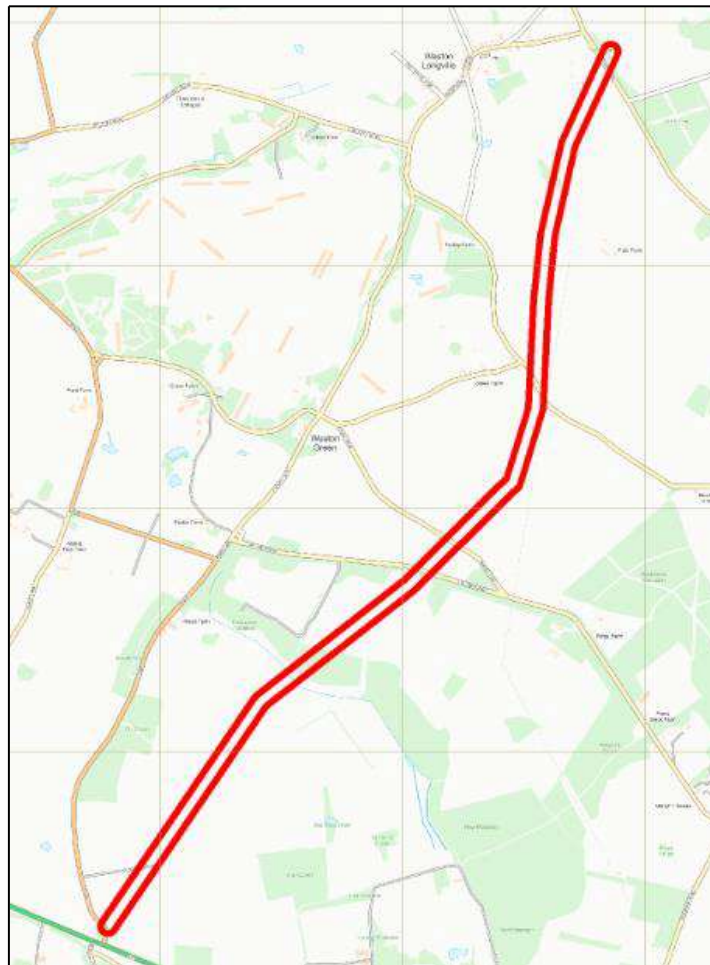
Probability of UXO Encounter



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PRELIMINARY UNEXPLODED ORDNANCE (UXO) THREAT ASSESSMENT

Meeting the requirements of CIRIA C681 'Unexploded Ordnance (UXO) – A guide for the Construction Industry' Risk Management Framework



6 ALPHA PROJECT NUMBER	P7197	ORIGINATOR	B. Wilkins
LANDMARK ORDER NUMBER	194238091_1	REVIEWED BY	C. Cole (18 th February 2019)
CLIENT REFERENCE	NWL Line 2	RELEASED BY	R. Griffiths (18 th February 2019)
SITE	Site at 610823, 314082		
RECOMMENDATION	This Site requires a Detailed UXO Threat and Risk Assessment		

STUDY SITE

The Study Site is described as “Site at 610823, 314082”, and it is centred on National Grid Reference 611010, 313990.

THREAT POTENTIAL AND RECOMMENDATIONS

The potential for a UXO hazard to occur, and more specifically, the potential for unexploded WWI and WWII ordnance to exist at this site is assessed as being **LIKELY** (*Figure 2*).

In accordance with *CIRIA C681* Chapter 5 on managing UXO risks, *6 Alpha* recommends that the next stage in the risk management framework is:

DETAILED UXO THREAT & RISK ASSESSMENT

We would be pleased to provide this service, please contact *Envirocheck* for further details:



REPORT SUMMARY

During WWII, the Study Site was situated within *St Faiths & Aylsham Rural District* and *Mitford & Launditch Rural District* which both recorded one High Explosive (HE) bomb strike per 100 hectares; a very low level of bombing.

Luftwaffe aerial reconnaissance photography associated with the Site identified an airfield (located on-site, 45m west, 290m west and 290m west) as a primary bombing target.

Further research identified that the airfield was *Royal Air Force (RAF) Attlebridge* (on-site, 20m north-west and 175m west) which was active between 1941-1956. It’s primary purpose was originally a satellite station, which then extended to accommodate *RAF* and *American Air Force* heavy bomber groups and training. An analysis of official site plans identified bomb stores 285m west.

Air Raid Precaution (ARP) records did not identify any HE bomb strikes on-site. However, three HE bombs were identified within 875m of the Site boundary; the closest being 450m west. Additionally, two unknown bombs were identified 565m west and 675m west, as well as an incendiary bomb located 900m west.

Given that *RAF Attlebridge* was identified on-site; it would suggest that further action is warranted to address the potential for UXO encounter.

USING THIS REPORT

This Preliminary Assessment is designed to inform environmental and construction professionals of the potential threat of military related explosives and/or ordnance on, or in, the vicinity of the Study Site.

This assessment is designed to be employed as a site-screening tool to meet with the requirement of Phase One of the *CIRIA UXO Risk Management Framework*; there are two broad prospective outcomes; either the threat level requires a detailed threat & risk assessment; or no further action is required. In the former instance we can provide a report within 10 working days (or more quickly upon application).

Two figures accompany the report, the *Second World War (WWII)* High Explosive (HE) Bomb Density and the final Probability of UXO Encounter. The purpose of this approach is to demonstrate that whilst bomb density statistics give an indication for WWII bombing, they should not be relied upon exclusively to generate a holistic assessment.












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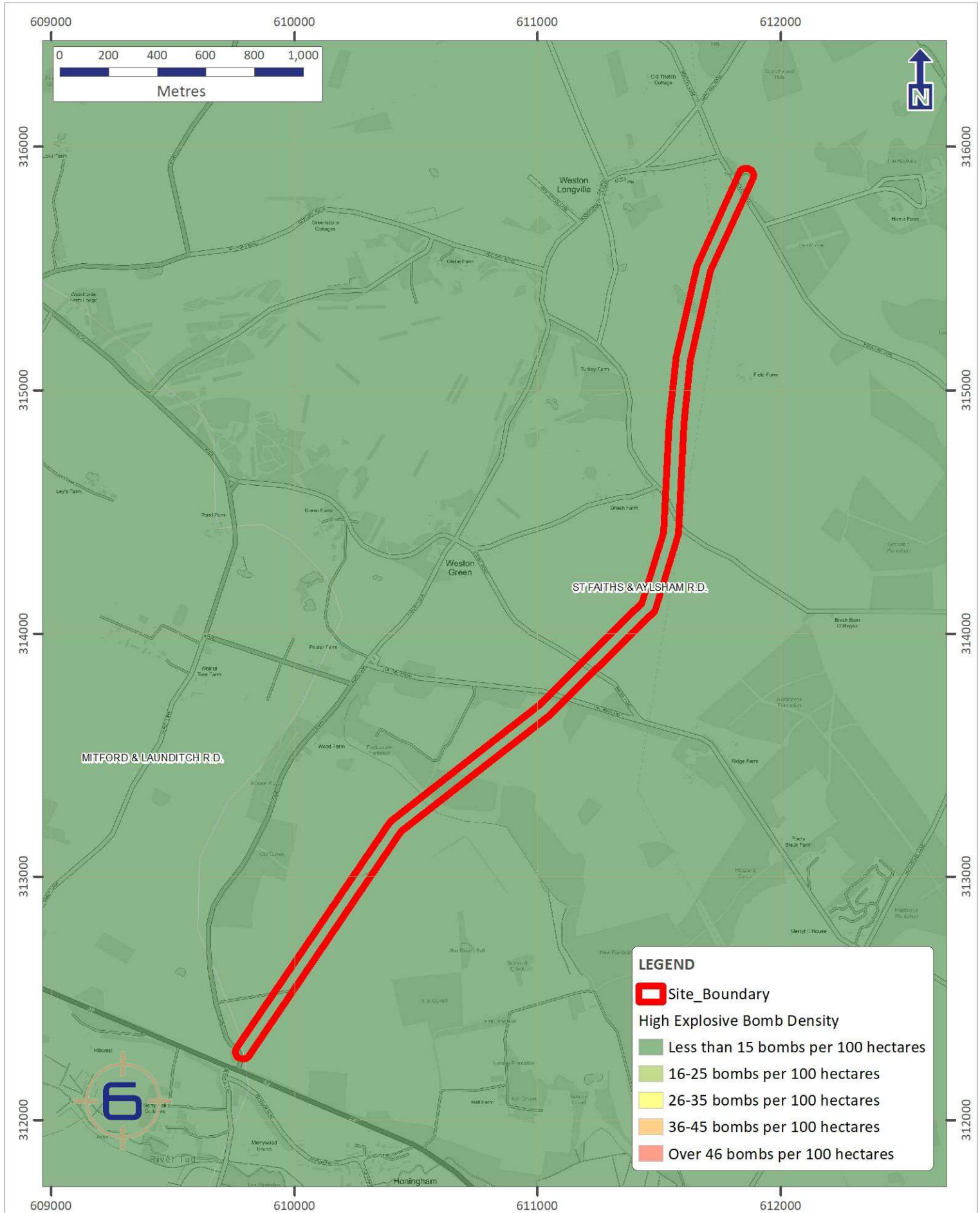
Email: customerservice@envirocheck.co.uk


DATA FINDINGS

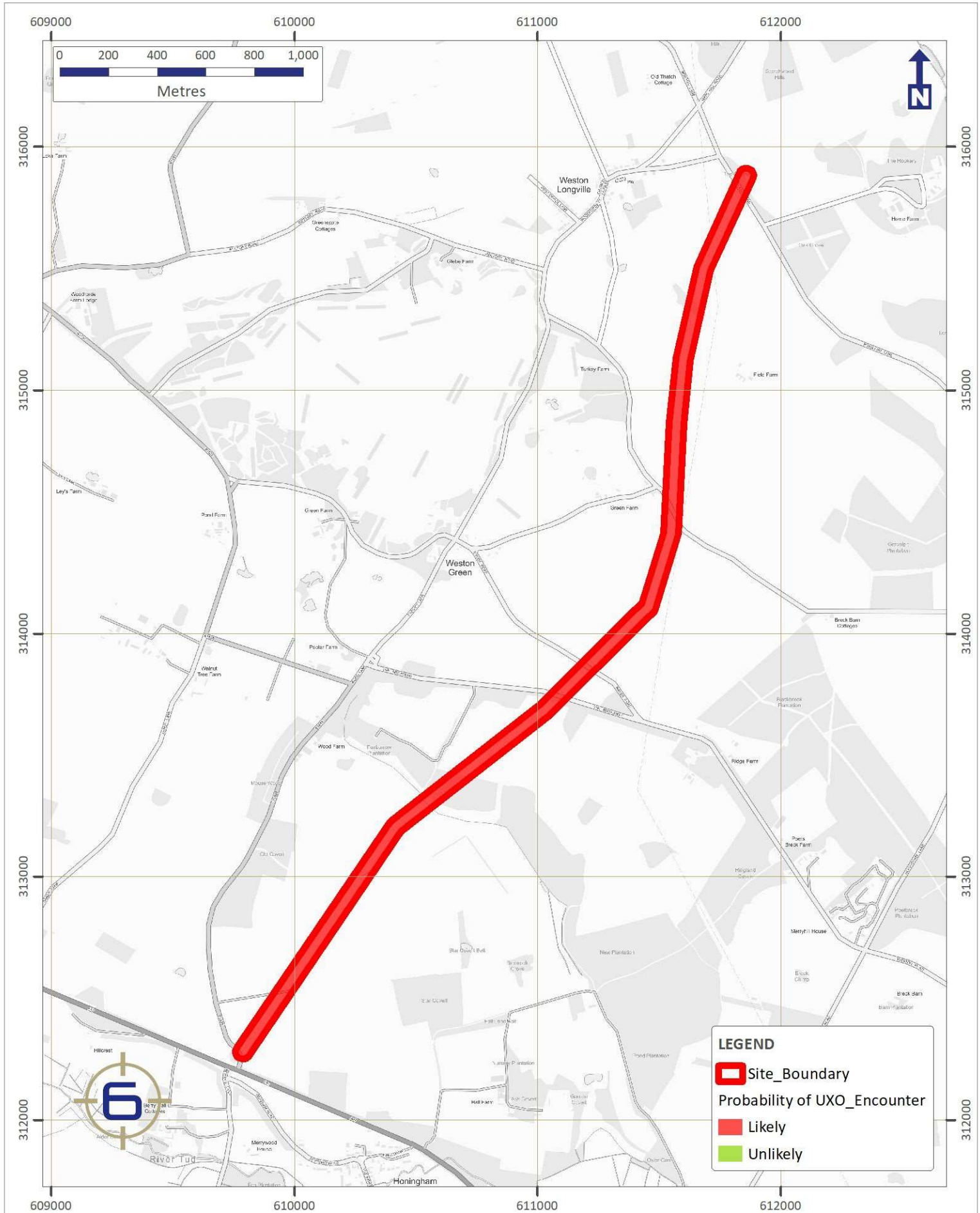
Threat Source (within 1,000m)	Detail	
	Identified	Comments
 Airfields/Military Facilities	✓	RAF Attlebridge (on-site, 20m north-west and 175m west).
 Ordnance Manufacture/Storage	✓	Official site plans identified bomb stores (285m west).
 WWII Decoy Bombing Sites	✗	None recorded within 1,000m.
 WWII Defensive Features	✗	None recorded within 1,000m.
 WWII Luftwaffe Designated Bombing Targets	✓	Luftwaffe aerial photography identified an airfield (on-site, 45m west, 290m west and 290m west) as primary bombing targets.
 WWII Bomb Strikes Within Site Boundary	✗	ARP records did not identify any HE bombs on-site.
 WWII Bomb Strikes Near Site Boundary	✓	ARP records identified three HE bomb strikes; 450m west, 605m west and 875m west.
 WWII Bomb Damage	✗	Official bomb damage mapping was not available.
 Abandoned Bomb Register	✗	The official abandoned bomb list did not identify any abandoned bombs located within 1,000m.
 Potential Threat Sources	✓	The most probable UXO threat is posed by LSA/SAA/AXO associated with former RAF sites.
 WWII Bombing Density Per 100 Hectares	✓	St Faiths & Aylsham Rural District and Mitford & Launditch Rural District, both recording one HE bomb strike per 100 hectares.


IMPORTANT NOTES

1. The term 'Preliminary UXO Threat Assessment' has been used to describe this report, to fall in line with the CIRIA C681 guidelines. Whilst the term 'Risk' can be justifiably used at this stage, the reader should note that the 'Consequence' function of 'Risk' is not considered. Should it be required, this would be addressed in the 'Detailed UXO Threat & Risk Assessment' (Stages 2 and 3).
2. This report is accurate and up to date at the time of writing.
3. The assessment levels have been generated from historical data and third party sources. Where possible 6 Alpha have sought to verify the accuracy of such data, but cannot be held accountable for inherent errors that may be in third party data sets (e.g. National Archives or library sources).
4. 6 Alpha have exercised all reasonable care, skill and due diligence in producing this service.
5. Whilst every effort has been used to identify all potential UXO/explosive threats, there were a number of private facilities, which may not have released privately recorded information concerning UXO/explosive threats into the public domain. It is therefore possible that some of the aforementioned sites may not be included within the database.



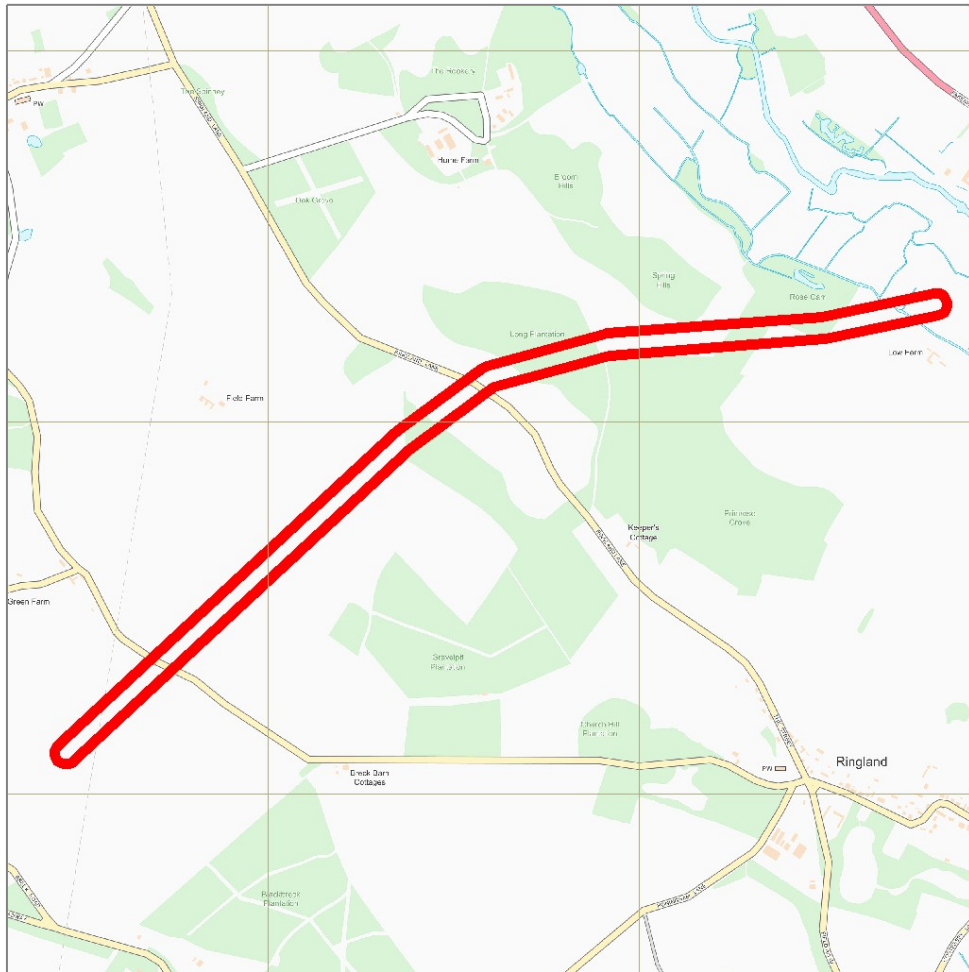
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PRELIMINARY UNEXPLODED ORDNANCE (UXO) THREAT ASSESSMENT

Meeting the requirements of CIRIA C681 'Unexploded Ordnance (UXO) – A guide for the Construction Industry' Risk Management Framework



6 ALPHA PROJECT NUMBER	P7200	ORIGINATOR	L. Hayes
LANDMARK ORDER NUMBER	194264816_1	REVIEWED BY	C. Cole (18 th February 2019)
CLIENT REFERENCE	NWL Line 3	RELEASED BY	R. Griffiths (18 th February 2019)
SITE	Site at 612627, 314714		
RECOMMENDATION	No further action is required to address the UXO risk at this Site		

STUDY SITE

The Study Site is described as “Site at 612627, 314714”, and it is centred on National Grid Reference 612540, 314890.

THREAT POTENTIAL AND RECOMMENDATIONS

The potential for a UXO hazard to occur, and more specifically, the potential for unexploded WWI and WWII ordnance to exist at this site is assessed as being **UNLIKELY** (*Figure 2*).

In accordance with *CIRIA C681 Chapter 5* on managing UXO risks, *6 Alpha* concludes that **NO FURTHER ACTION** is required to address the UXO risk at this Study Site. Should you have any queries, please contact *Envirocheck*.

Telephone: +44 (0)844 844 9952

Email: customerservice@envirocheck.co.uk



REPORT SUMMARY

During WWII, the Study Site was situated within *St Faiths & Aylsham Rural District*, which recorded one High Explosive (HE) bomb strike per 100 hectares; a very low level of bombing.

Luftwaffe aerial reconnaissance photography associated with the Site an airfield (located 390m north-west, 415m south-west, 870m south-west and 950m south-west) as a primary bombing target.

Further research identified this airfield as *Royal Air Force (RAF) Attlebridge* (located 340m south, 510m north-west, 585m south-west, 880m south-west and 985m south-west) which was active between 1941-1956. Its primary purpose was originally as a satellite station, before then being extended to accommodate *RAF* and *American Air Force* heavy bomber groups and their training. An analysis of official site plans identified bomb stores 650m north-west.

Air Raid Precaution (ARP) records did not identify any HE bomb strikes within the Site. However, one HE bomb strike was identified 640m west and one unknown bomb was identified 775m north-west.

Despite an airfield being located within the area during WWII; there is no evidence to suggest that further investigation into UXO is warranted.

USING THIS REPORT

This Preliminary Assessment is designed to inform environmental and construction professionals of the potential threat of military related explosives and/or ordnance on, or in, the vicinity of the Study Site.

This assessment is designed to be employed as a site-screening tool to meet with the requirement of Phase One of the *CIRIA UXO Risk Management Framework*; there are two broad prospective outcomes; either the threat level requires a detailed threat & risk assessment; or no further action is required. In the former instance we can provide a report within 10 working days (or more quickly upon application).

Two figures accompany the report, the *Second World War (WWII)* High Explosive (HE) Bomb Density and the final Probability of UXO Encounter. The purpose of this approach is to demonstrate that whilst bomb density statistics give an indication for WWII bombing, they should not be relied upon exclusively to generate a holistic assessment.












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Email: customerservice@envirocheck.co.uk

DATA FINDINGS

Threat Source (within 1,000m)	Detail	
	Identified	Comments
 Airfields/Military Facilities	✓	RAF Attlebridge (340m south, 510m north-west, 585m south west, 880m south-west and 985m south-west).
 Ordnance Manufacture/Storage	✓	Official site plans identified bomb stores (650m north-west).
 WWII Decoy Bombing Sites	✗	None recorded within 1,000m.
 WWII Defensive Features	✗	None recorded within 1,000m.
 WWII <i>Luftwaffe</i> Designated Bombing Targets	✓	An airfield (390m north-west, 415m south-west, 870m south-west, and 950m south-west).
 WWII Bomb Strikes Within Site Boundary	✗	ARP records did not identify any HE bomb strikes on-site.
 WWII Bomb Strikes Near Site Boundary	✓	ARP records identified one HE bomb strike 640m west and one unknown bomb strike 775m north-west.
 WWII Bomb Damage	✗	Official bomb damage mapping was not available.
 Abandoned Bomb Register	✗	The official abandoned bomb list did not identify any abandoned bombs within 1,000m.
 Potential Threat Sources	✗	Further research has not uncovered any potential UXO threats associated with the Study Site.
 WWII Bombing Density Per 100 Hectares	✓	The Site was located within <i>St Faiths & Aylsham Rural District</i> , which recorded one HE bomb strike per 100 hectares.

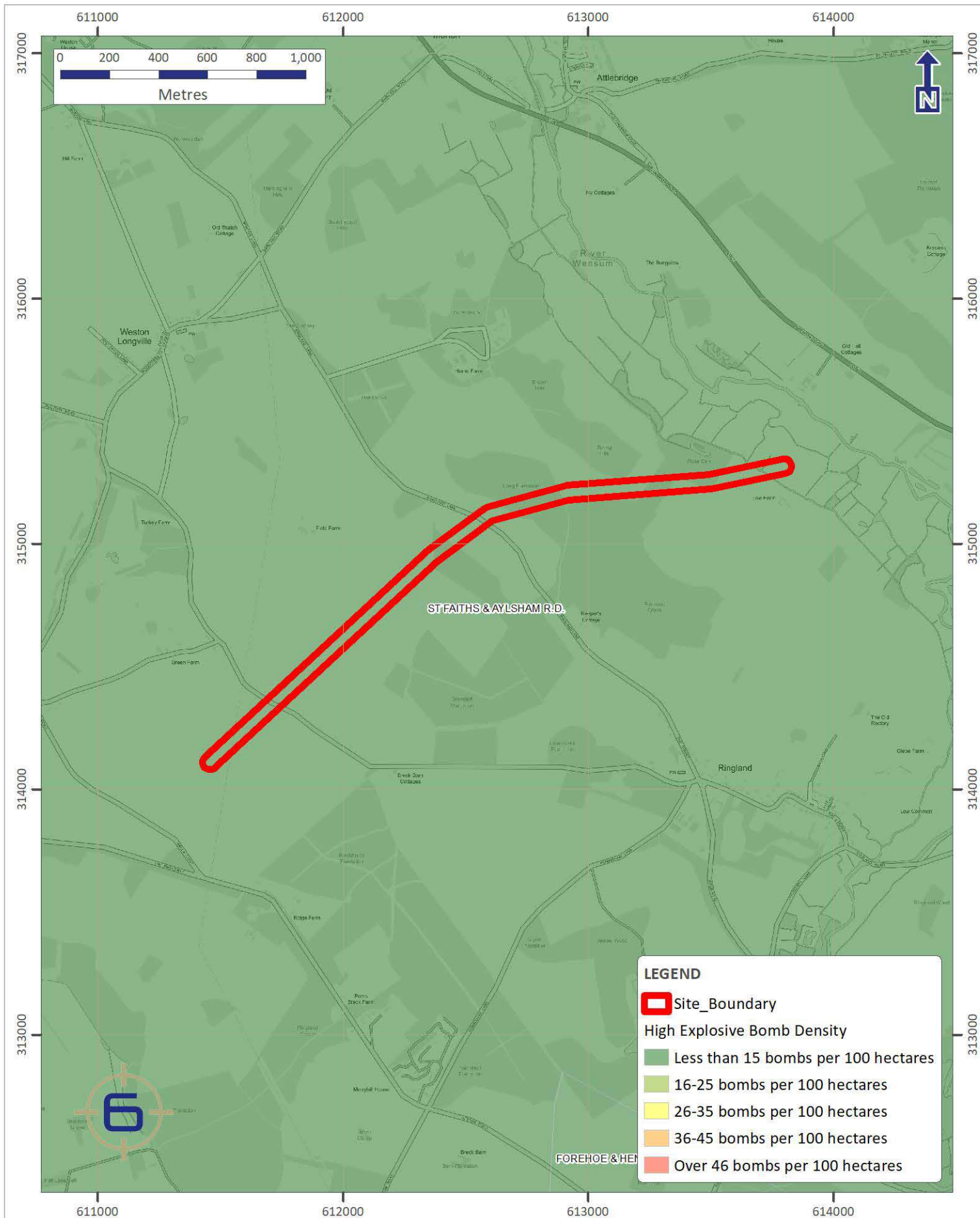
IMPORTANT NOTES

1. The term 'Preliminary UXO Threat Assessment' has been used to describe this report, to fall in line with the CIRIA C681 guidelines. Whilst the term 'Risk' can be justifiably used at this stage, the reader should note that the 'Consequence' function of 'Risk' is not considered. Should it be required, this would be addressed in the 'Detailed UXO Threat & Risk Assessment' (Stages 2 and 3).
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SITE AT 612627,314714

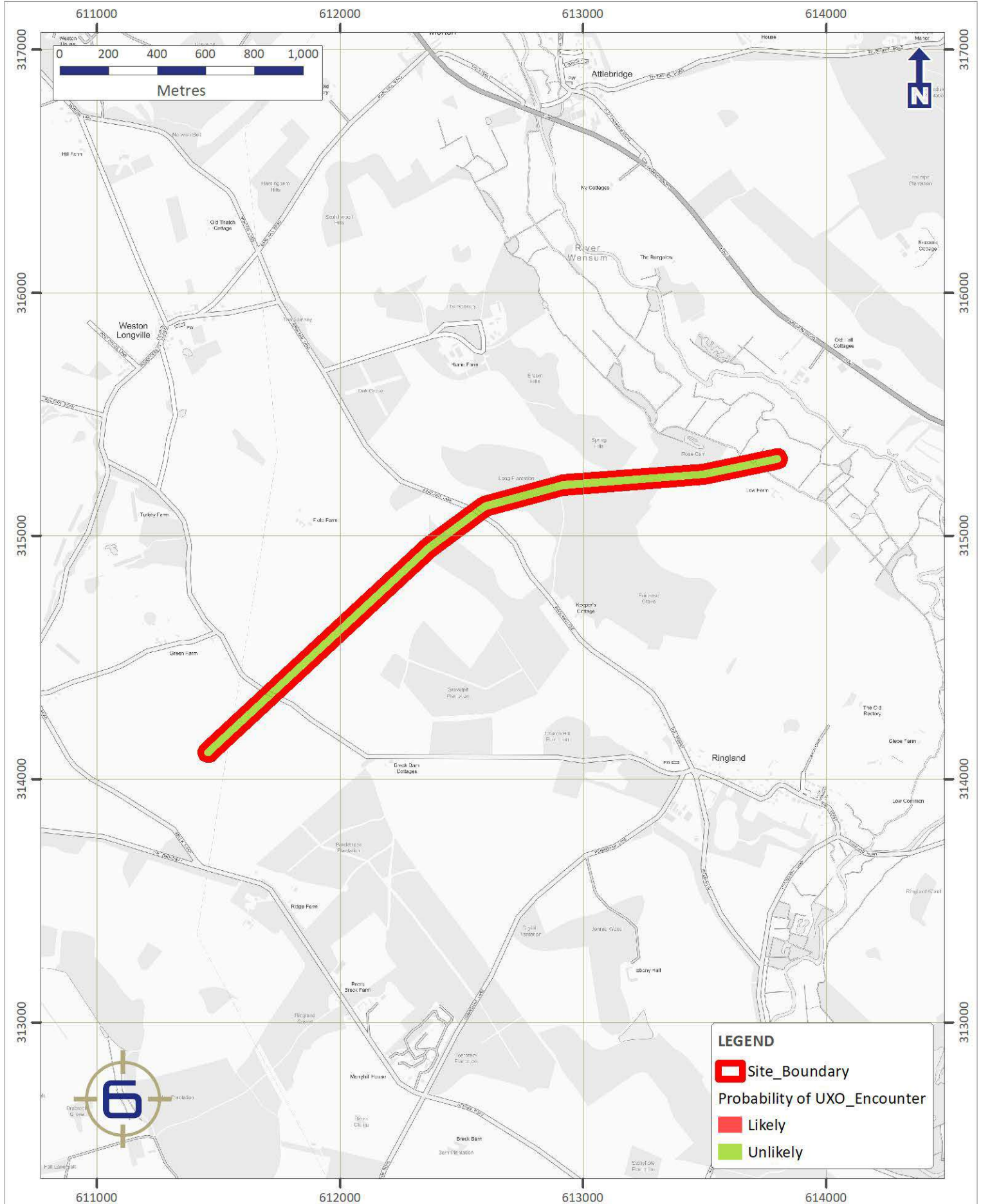
WWII High Explosive Bomb Density






LEGEND


- Site_Boundary
- High Explosive Bomb Density
 - Less than 15 bombs per 100 hectares
 - 16-25 bombs per 100 hectares
 - 26-35 bombs per 100 hectares
 - 36-45 bombs per 100 hectares
 - Over 46 bombs per 100 hectares

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LEGEND

-  Site_Boundary
- Probability of UXO_Encounter
-  Likely
-  Unlikely

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PRELIMINARY UNEXPLODED ORDNANCE (UXO) THREAT ASSESSMENT

Meeting the requirements of *CIRIA C681* 'Unexploded Ordnance (UXO) – A guide for the Construction Industry' Risk Management Framework



6 ALPHA PROJECT NUMBER	P7196	ORIGINATOR	L. Hayes
LANDMARK ORDER NUMBER	194236735_1	REVIEWED BY	C. Cole (18 th February 2019)
CLIENT REFERENCE	NWL Line 4	RELEASED BY	R. Griffiths (18 th February 2019)
SITE	Site at 613309, 313834		
RECOMMENDATION	No further action is required to address the UXO risk at this Site		