OXFORDSHIRE
STRATEGIC RAIL FREIGHT INTERCHANGE

Environmental Statement

Chapter 11: Ground Conditions
Appendix 11.5: Road Corridor Geo-Environmental Assessment

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On behalf of
Oxfordshire Railfreight Limited

Prepared by BWB Consulting Ltd
November 2022

BWB
A CAF GROUP COMPANY

ENVIRONMENT

Oxfordshire Railfreight Ltd
Oxfordshire RFI – New Road Corridors
Ardley, Oxon

Phase 2 Geo-Environmental Assessment

ENVIRONMENT

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Ardley, Oxon
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EXECUTIVE SUMMARY

EXECUTIVE SUMMARY	
Site Address	The site is located near Arden, Oxfordshire located at National Grid Reference 453909, 226366.
Proposed Development	The proposed wider site development is understood to comprise multiple plot warehouse developments with associated hardstand areas including parking, loading and road access. The development will also include a new rail freight terminal in the north of the site adjacent to the existing railway and the relocation of a waste treatment facility (compositing) which is currently situated in the southern portion of the site. Ashgrove Farm located in the east of the site will be retained. The site will be served by new access routes including Ardley bypass to the north, linking to the M40 Motorway, and the Middleton Stoney bypass to the south east. To accommodate the proposed development, a significant earthworks exercise will need be completed. This report focusses on preliminary Geo-environmental ground investigation and assessment of the proposed new road access routes.
Site Setting	The site is located near the village of Ardley with mixed residential, agricultural and commercial surroundings. The site itself consists of a mixture of predominantly arable and pasture fields but with existing road infrastructure in some areas. Particularl in the north near the M40. The site is irregular in shape, covers an area of approximately 260ha and stretches from Baynard's Green field north of Junction 10 of the M40 down south to Middleton Stoney village along the B340 road. The Chiltern Mainline Railway runs through the central area of the site. Its topography is generally gently sloping towards the centre and south.
Published Ground Conditions	The site is underlain by bedrock of the White Limestone Formation (a Principal Aquifer) with localised superficial deposits mapped comprising Head and Alluvium deposits aligned along watercourses. Available borehole logs in the vicinity of the site, based on records provided by the British Geological Survey (BGS), indicate ground conditions to comprise topsoil over weathered deposits of the White Limestone formation with solid bedrock from approximately 1m below ground level (bgl). The site is not located in a Coal Mining Reporting Area, as classified by the Coal Authority.
Ground Investigation	Ground investigation comprised: • Twenty-nine machine excavated trial pits (TP) spread across the site to obtain good site coverage. • Chemical analysis of soils and groundwater for suite of analysis capturing the identified contaminants of concern. • Geotechnical testing of soil.
Ground Conditions Encountered	Encountered ground conditions generally confirmed the geological sequence identified in published geology. Made Ground was not encountered. Topsoil was encountered across the site, and was generally shallow, with a maximum thickness of 0.31m. Limestone deposits identified were of the White Limestone Formation (WLF). Competent bedrock of the White Limestone Formation was typically encountered between 0.45m and 2.0m bgl. No significant visual or olfactory evidence of contamination was observed during the ground investigation. Shallow groundwater was not encountered during the trial pitting undertaken.
Geotechnical Appraisal	The underlying limestone is likely to form a strong competent base for road construction, though it is frost susceptible and will probably require a minimum thickness of sub base material of 450mm. Excavation for services may be

	problematic given rock strength and competency and may require extended periods of breaking.
Environmental Appraisal	Soil, and soil leachate concentrations recorded across the site are not considered to represent a significant risk to the identified receptors.
Waste Assessment	Soil samples have been characterised against hazardous waste criteria using Hazwaste Online. The assessment indicates that the soils analysed are likely to be classified as non-hazardous with the exception of one location sampled during the ground investigation which was classified as hazardous due to zinc concentrations.
Recommendations	Liaison with Network Rail will be required to manage geotechnical risk on the interfaces with their infrastructure. Detailed geotechnical assessment will be required to manage geotechnical risks on the project including rock excavation, settlement issues, foundation solutions, retaining structures and slope stability. Further ground investigation will be required to inform detailed design.
This summary should be read in conjunction with BWB's full report (ref. OXSRFI -BWB-ZZ-XX-RP-YE-0005-Ph2_P1) and reflects an assessment of the Site based on information received by BWB at the time of production.	

CONTENTS

EXECUTIVE SUMMARY iii
1. INTRODUCTION 1
2. THE SITE 4
Site Location 4
Site Description 4
Previous Report Summary 5
3. PUBLISHED GROUND CONDITIONS 7
Published Geology 7
Hydrogeology 7
Hydrology 8
4. PRELIMINARY ENVIRONMENTAL RISK ASSESSMENT 10
Introduction 10
5. PHASE II ENVIRONMENTAL AND GEOTECHNICAL GROUND INVESTIGATION 12
Chemical Sampling Strategy 12
Chemical Analytical Strategy 12
6. GROUND CONDITIONS ENCOUNTERED 14
Geological Summary 14
7. GEOTECHNICAL ASSESSMENT 17
Roads and Pavements 17
Drainage 17
Groundwater 18
Chemical Attack on Buried Concrete 18
8. HUMAN HEALTH RISK ASSESSMENT 19
Contamination Distribution 19
Pathways 19
Risk Assessment 20
9. CONTROLLED WATERS RISK ASSESSMENT 21
10. ENVIRONMENTAL RISK ASSESSMENT 23
11. WASTE MANAGEMENT 24
Waste Classification 24
12. CONCLUSION AND RECOMMENDATIONS 25
Conclusions 25
Recommendations 25
13. REFERENCES 27

FIGURES

Figure 2:1 : Site Location Plan
Figure 6:1 : Plasticity Chart

TABLES

Table 2:1: Evidence of Historical Contamination
Table 3:1 : Surface Water Features
Table 4:1 : Preliminary Conceptual Site Model (Road Corridor)
Table 6:1 : Summary of Ground Conditions
Table 6:2 : PSD Results Summary
Table 8:1 : Commercial Exposure Pathways
Table 9:1 : Controlled Water Exposure Pathways
Table 9:2 : Summary of Leachable Contamination Exceedances

APPENDICES

Appendix 1 : CIRIA Risk Classification Scheme
Appendix 2 : Factual Ground Investigation Report
Appendix 3 : Detailed UXO Risk Assessment
Appendix 4 : CLEA Flowchart and Work Sheets
Appendix 5 : Soil Leachate Results
Appendix 6 : Hazwaste Results

1. INTRODUCTION

Instruction

1.1 BWB Consulting (BWB) was instructed by Oxfordshire Railfreight Ltd (the Client) to carry out a Phase 2 Geo-Environmental Assessment. Details of the project brief are included in BWB proposal reference 210707/P02/01/NTH2479/KES/RTR dated 07/07/2021.

1.2 The proposed development is anticipated to comprise a multiple steel portal frame warehouse development with associated hardstand areas including parking, loading and road access. The development will also include a new rail freight terminal in the north of the site adjacent to the existing Chiltern Mainline Railway and the relocation of a waste treatment facility (composting) which is currently situated in the southern portion of the site. Ashgrove Farm located in the east of the site will be retained. The site will be served by new access routes including Ardley bypass to the north linking to the M40 Motorway and Middleton Stoney bypass to the south east.

1.3 This report focusses on preliminary Geo-environmental ground investigation and assessment of the proposed new access routes.

Previous Reports

1.4 The following geo-environmental reports have previously been completed by BWB for the site:

- '*Phase 2 Geo-Environmental Assessment*' by BWB Consulting Ltd for Oxfordshire Railfreight Ltd, reference OxSRFI-BWB-ZZ-XX-RP-YE-0001-Ph2_P1, dated April 2022.

1.5 The following geo-environmental reports have previously been completed for the site and made available for BWB to review:

- '*Oxfordshire SRFI- Off-site Highways Phase 1 Geotechnical and Geoenvironmental Desk Study*' by Hydrock for Oxfordshire Railfreight Ltd, reference 15560-HYD-OSH-XX-GE-RP-1002-S2-P1, dated July 2021;
- 'Land to the NE, E, SE of RAF Heyford Oxfordshire Explosive Ordnance Desktop Study Project 21056' by EOD Contracts Ltd, reference EOD/21/21056/DTS/HYDROCK/(Land to the NE, E, SE of) RAF Heyford, Oxfordshire, dated February 2021;
- Land east of the former Royal Air Force (RAF) Upper Heyford, near Bicester, Oxfordshire; Radiological Desk Study; ref. P11031-21; dated 11 th September 2021; and
- '*Oxfordshire RFI Ardley, Oxon Factual Ground Investigation Report*' by Exploration & Testing Associates for BWB Consulting Ltd, reference C10172-FGIR-03, dated October 2022.

1.6 It is understood that the Client has reliance on the above reports and therefore pertinent information has been included within this report, are provided on an information only basis where appropriate.

1.7 Additionally, several previous reports relating to the site and immediate surroundings are referenced within the Hydrock (2021) desk study report:

- 'Heyford Park Development. Locations of Possible Contamination Sources' by Arup, reference 120643-00 GG_G.2 – 01, dated June 2007;
- 'Ardley Energy from Waste Facility, Ardley, Oxfordshire. Post Application Response: Hydrology and Hydrogeology' by SLR Consulting Limited, reference 409-0036-00349, dated July 2009;
- 'Ardley Quarry EfW. EIA Extract. Chapter 9. Geology Hydrology and Hydrogeology' by SLR, Unreferenced, Undated;
- 'Ardley Quarry EfW. EIA Extract. Chapter 11. Palaeontology' by SLR, Unreferenced, Undated;
- 'Heyford Park – Flying Field, Hydrogeological Characterisation and Groundwater Quality Assessment' by Waterman Energy, Environment & Design Ltd (Waterman), reference EED10658-109_R_9.3.1.FA, dated March 2012;
- 'Land at Ashgrove Farm, Ardley, Oxon. Desk Study Report' by Hydrock, reference R/12421/001 Version 2, dated August 2014. (Included in this report were copies of boreholes by SLR from 2006);
- 'Geo-Environmental Site Investigation, Ashgrove Farm, Ardley' by BRD Environmental Ltd, reference BRD2409-OR-1, dated October 2015; and
- 'Preliminary Environmental Risk Assessment Southern Bomb Store, Former RAF Upper Heyford, Oxfordshire' by Waterman Infrastructure & Environment Ltd, reference WIB14371-R-100-2-3-3.FA, dated June 2016.

1.8 Information from the Hydrock (2021) desk study report in relation to the above reports has been included where relevant.

Objectives

1.9 The objectives of the report are to assess:

- Geo-environmental ground conditions of the proposed new access routes;
- The prevailing ground and groundwater conditions across the site;
- The potential presence and extent of contamination in shallow soil and groundwater beneath the site;
- The significance and magnitude of the observed contamination through comparison of analytical data to appropriate published environmental screening criteria; and
- The geotechnical properties of the soil beneath the site to assist preliminary road design.

1.10 The above objectives will allow the preliminary Conceptual Site Model presented in the Phase 1 report to be verified and updated. The report has been completed in accordance with BS10175:2011(+A2:2017) 'Investigation of Potentially Contaminated Sites, Code of Practice' and EA Guidance on Risk Management of Land Contamination https://www.gov.uk/government/publications/land-contamination-risk-management-lcrm.

1.11 This report presents the information obtained from a desk study and the ground investigations and contains relevant factual information from the previous investigations undertaken by others. The report, together with the associated Figures and Appendices, provides a Ground Investigation Report (GIR), as defined in BS EN 1997-1:2004 and BS EN 1997-2:2007

Scope of Works

1.12 The ground investigation scope of works was completed between 12/09/2022 and 16/09/2022 and comprised the following:

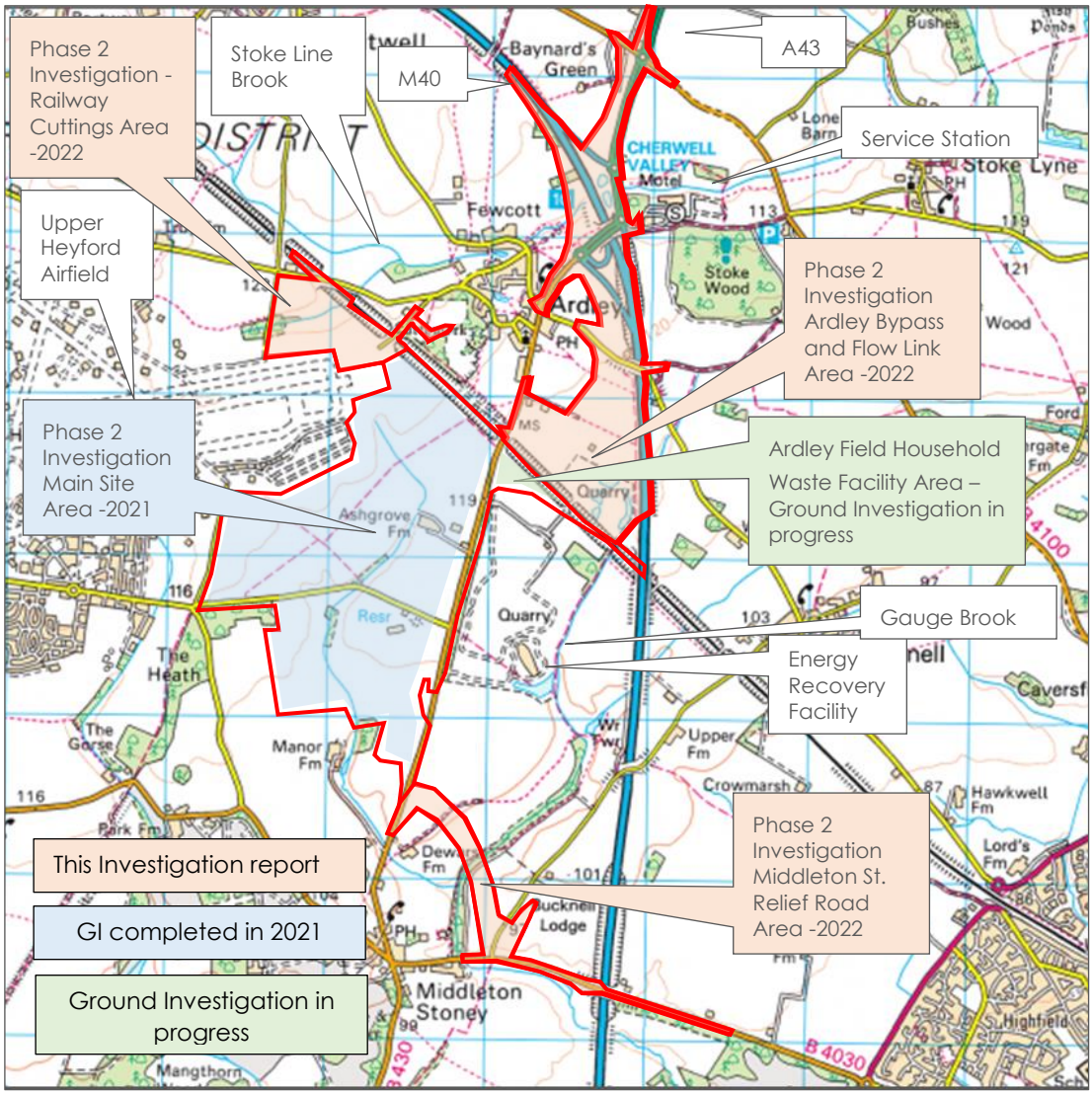
- Non-intrusive survey of excavation locations for underground utilities;
- 29 machine excavated trial pits;
- Chemical analysis of soils; and
- Geotechnical testing of soil.

2. THE SITE

Site Location

2.1 The site is located in Arden, Oxfordshire located at National Grid Reference 453909E, 226366N. The location of the site is shown in **Figure 2:1** with the areas covered by this report highlighted pale red. The wider site was largely investigated in 2021 (pale blue), and the Ardley landfill, currently being investigated in pale green.

Figure 2:1: Site Location Plan



Site Description

2.2 The site is irregular in shape and stretches from Baynard's Green field north of Junction 10 of the M40 down south to Middleton Stoney village along the B340 road.

2.3 Site areas with respect of the different phases of the ground investigation are described below.

Area of the proposed Ardley Bypass and Flow Link.

2.4 The area to the north includes agricultural fields to the north and south of junction 10 of the M40, most of the area is generally flat and at an elevation of approximately 120m above Ordnance Datum (AOD). The fields are divided by the junction slip roads between the M40, the A43 and B4100, with an isolated parcel of land with two balancing ponds west of Cherwell Valley Services. The slip roads are all on embankments north of the junction, and the junction lies within the valley of Stoke Lyne Brook that runs east to west, sloping down from an elevation of approximately 120m to 110m AOD. South of the junction the site includes agricultural fields between the B340 (Ardley Road), the M40 (here in low cutting then at grade) and the Chiltern Main Line rail (on cutting) with exclusion to a quarry area to the southeast. The area by Ardley Road and generally slopes to the southeast and includes farm buildings close to the B340.

2.5 Small portions of fields are included east of the M40 and south of the railway, in an area accessed by Ardley Field Household Waste facility which is subject to a separate investigation.

Railway Cutting Area to the northwest

2.6 A railway cutting and agricultural fields are located in the northwest of the site, north of Upper Heyford airbase which has not included of the previous main site ground investigation area.

Area of the proposed Middleton Stoney Relief Road to the southeast.

2.7 The village of Middleton Stoney lies around a kilometre to the south of the site. A strip of land running to the east of the B340 with a northwest to southeast direction terminating into the B4030 Road, is included within the masterplan for the development of Middleton Stoney Relief Road. The area itself consists of a mixture of predominately arable and pasture fields with Gagle Brook flowing from the northeast to the south. Its topography is generally flat but slopes gently towards the watercourse towards the south of the site. In addition, dense vegetation exists in the vicinity of the watercourse.

Previous Investigation area (Main Site)

2.8 The largest site surface is located within an open agricultural field including Ashgrove Farm, bounded by the Chiltern Main Line rail to the northeast, the B340 the east, Chilgrove Drive and the former Upper Heyford airbase to the west and northwest, and extending further south Camp Road towards parcels of land belonging to Manor Farm. A full description of the area is included within the previous investigation report.

Previous Report Summary

2.9 The report summarised the Hydrock information for the Phase 1 for the entire site and present the outcome of the ground investigation undertaken in the central area of the site. Relevant information included for the conceptual site model (CSM) for the whole site is summarised in **Table 2:1** below.

Table 2:1: Evidence of Historical Contamination

Contamination Evidence from Hydrock Report	Location
On Site	
Historical and current use/storage of petroleum hydrocarbons, including above ground (diesel and paraffin) and underground tanks (diesel) and an oil store. Elevated metal concentrations in Made Ground. Hydrocarbon evidence in the vicinity of the former underground tank. Elevated total petroleum hydrocarbons (TPH), polyaromatic hydrocarbons (PAH) and benzene, toluene, ethylene, and xylene (BTEX) concentrations in groundwater in the vicinity of the former underground tank. Asbestos Containing Materials (ACMs) on the ground surface and in/on buildings. Potential for PCBs and oil associated with an electrical substation at the entrance to Ashgrove Farm dated 1974. Remediation works in 2014/2015 of several tanks, comprising removal and infilling with imported stone.	Ashgrove Farm (**central onsite – part of the previous investigation**)
Significant elevated concentrations of ground gas (methane and carbon dioxide) at the landfill. Occasional elevated nickel concentrations recorded in groundwater.	Former Ardley Landfill (subject to separate Ground Investigation and Assessment)
Off Site	
Historical storage of petroleum hydrocarbons, including multiple underground tanks (diesel, gasoline, and jet fuel) and infrastructure (BWB note this is outside of the current site boundary). Elevated concentrations of petroleum hydrocarbons and phenols in groundwater. Occasional phenol concentrations recorded above detection limit in surface water samples in the vicinity. Remediation works in March 2012 comprising emptying cleaning and backfilling tanks and filling buried pipelines with foam.	Upper Heyford Airfield (**northwest offsite**)

3. PUBLISHED GROUND CONDITIONS

Published Geology

3.1 British Geological Survey (BGS) mapping for the site indicates that the site is predominantly underlain by White Limestone Formation (comprising limestone, wackestone, packstone, grainstone and mudstone), with superficial deposits generally absent. The entire site area is underlain by Sedimentary Bedrock formed during the Jurassic Period. A geological fault is shown to transect the north and northwest corner of the site, trending west to northeast and downthrown to the north.

3.2 The site is also interspersed with smaller areas of Rutland Formation (comprising mudstone, siltstone, and sandstone), and Forest Marble Formation Limestone (comprising mudstone, limestone, and sandstone) in the northwest of the site. Superficial deposits of Head (comprising Clay, Silt, Sand and Gravel) and Alluvium (comprising Clay, Silt, Sand and Gravel) are recorded along stream courses running through the centre of the site trending north to south and in the northwest corner of the site.

3.3 It is noted in the Hydrock (2021) desk study report, that the White Limestone Formation is subdivided into the Blandon Member (clay/mudstone), the Ardley Member (limestone, wackestone, packstone and mudstone) and the Shipton Member (limestone, wackestone, packstone and mudstone), based on geological cross sections of the area.

3.4 BGS boreholes records and previous ground investigation records generally indicate topsoil or Made Ground underlain by shallow limestone. Further details are provided within the Hydrock (2021) desk study report.

3.5 The Groundsure report also indicates that an area of artificial ground is present in the east of the site described as infilled ground (Ardley Landfill). Several areas of artificial ground are present immediately to the northwest (airfield, railway cutting and Ardley Wood), north (M40 and service station) and east of the site (Ardley / Fields Farm Quarry and Ardley Landfill).

3.6 Previous limited ground investigation undertaken on the site by BWB and third parties confirmed the anticipated sequence of ground conditions indicated by BGS mapping.

Hydrogeology

3.7 The groundwater body beneath the majority of the site is the Tackley Jurassic and is classified as Good Chemical and Quantitative status under the Water Framework Directive (EEA, 2021) for the latest available year (2019). The Upper Bedford Ouse Oolite Principal 1 groundwater body is present beneath the far northern portion of the site and is classified as Good Chemical and Quantitative status for the same year.

3.8 The underlying ground conditions have been classified by the Environment Agency (EA) as follows:

Superficial Deposits

- Alluvium: Secondary (A) Aquifer; and
- Head Deposit: Secondary Undifferentiated Aquifer.

Bedrock

- White Limestone Formation: Principal Aquifer;
- Forest Marble Formation: Principal Aquifer; and
- Rutland Formation: Secondary (B) Aquifer.

3.9 There is one active licensed groundwater abstraction recorded as located on the site at Manor Farm in the south for general farming and domestic use. However, Manor Farm is located outside of the development boundary. There are no active licensed potable groundwater abstractions on or within 1km of the site. The site is not located in a groundwater Source Protection Zone.

3.10 Hydrock state that previous ground investigations on site reported groundwater in the White Limestone Formation at depths between 3.4 and 3.7m below ground level (bgl). Previous investigations did not encounter superficial deposits; however, perched groundwater could be present at shallow depths. Two groundwater bodies were expected by Hydrock at the base of each of the limestones, with the less permeable mudstone/siltstones/clays acting as an aquitard between the shallower and deeper groundwater bodies.

3.11 Groundwater is considered by Hydrock to be in hydraulic continuity with the surface water features on the site. Hydrock state that groundwater generally flows towards the southeast, although there may be some localised flow towards the railway cutting in the north, and the streams at the base of valleys in the south.

Hydrology

3.12 Several surface watercourses are present in and in the vicinity of the site which is presented in below:

Table 3:1 : Surface Water Features

Surface Water Feature	Location (Site Area)	Location (Flow)
Gagle Brook All options of the Middleton Stoney Relief Road will cross the brook and it runs approximately 100m south-east of the proposed M40 J10 south facing slips.	Generally, to the east of the site but crosses the site boundary in the southeast (**southeast on site**) flowing to the southeast.	Overall, hydraulically downgradient
Padbury Brook Classified as Good Chemical and Moderate Ecological status under the Water Framework Directive for the latest available year (2019). It is noted to be heavily modified.	North of the site crossing the M40 to the north of J10 (**north onsite**) flowing to the east	Hydraulically upgradient

Surface Water Feature	Location (Site Area)	Location (Flow)
M40 J10 balancing ponds Two balancing ponds are located between the M40 (west) and the A43 (east).	North of the site (**north on site**)	Hydraulically upgradient
Covered Reservoir Appears to have been constructed in the 1980s. Reservoir to be retained as part of proposed development.	Centre west of the site (**central onsite**)	Hydraulically cross-gradient. No continuity is expected.
Unnamed watercourses Two issues located central onsite which join the Gagle Brook offsite in the south. The proposed link to Heyford Park via Camp Road will cross this watercourse.	Centre of the site (**central on site**) flowing southeast	Hydraulically up/ cross-gradient
Gallos Brook (& Leys Farms Ditch) Classified as Good Chemical and Moderate Ecological status under the Water Framework Directive for the latest available year (2019).	200m west (**west off site**) flowing south	Hydraulically upgradient
Balancing ponds Two balancing ponds are located at the Viridor Ardley Energy Recovery Facility.	400m east (**east off site**)	Hydraulically cross/downgradient
River Cherwell Classified as Good Chemical and Moderate Ecological status under the Water Framework Directive for the latest available year (2019).	3km west (**west off site**) flowing south	Hydraulically upgradient
River Ray Classified as Good Chemical and Bad Ecological status under the Water Framework Directive for the latest available year (2019).	10km southeast (**southeast off site**) flowing southwest	Hydraulically downgradient

3.13 The majority of the site is considered by the EA to be at low risk of flooding (less than 1 in 1000 (0.1%) from rivers and the sea, with no noted flood defences or flood water storage areas in the vicinity of the site. However, small parts of the site (in the north and south) are in Flood Zone 3 in the location of the streams (Padbury Brook, Gagle Brook and Unnamed watercourses). A detailed flood risk assessment will be provided under a separate cover (BWB Baseline Flood Baseline Data Review OXR-BWB-ZZ-XX-RP-YE-0001_S0_P01_Baseline Data Review).

4. PRELIMINARY ENVIRONMENTAL RISK ASSESSMENT

Introduction

4.1 The risk posed by any contaminants in soil or groundwater will depend on the nature of the hazard, the probability of exposure, the pathway by which exposure occurs, and the likely effects on the receptors. A contaminant is defined as a substance that has the potential to cause harm, while a risk is considered to exist if such a substance is present in sufficient concentration to cause harm and a pathway exists for a receptor to be exposed to the substance.

4.2 The following sections discuss all the identified potential on and off-site sources, pathways and receptors in the context of the proposed development of the access road network and plausible pollutant linkages which may represent a risk to identified receptors such as human health and/or controlled waters from the data gained from the desk study. At this stage the assessment is qualitative and aimed to determine all pollutant linkages, irrespective of significance or allowing for uncertainty.

4.3 Three impact potentials exist for any given site; these are:

- The site impacting upon itself;
- The site impacting on its surroundings; and
- The surroundings impacting on the site.

4.4 All three impacts need to be considered in a risk assessment.

4.5 A Source, Pathway, Receptor analysis has been undertaken for the site based on the information provided in the preceding sections. This is presented as Table 4:1 and further information about the risk classification scheme is included within Appendix 1.

4.6 Sources (S); These are potential or known sources of contamination that may relate to a former land use or present site feature or process (e.g. fuel storage tanks).

4.7 Pathways (P); A pathway is defined as a mechanism or route by which a contaminant comes into contact with, or otherwise affects a receptor. Pathways by which the identified receptors may be impacted upon in the context of the proposed development.

4.8 Receptors (R); Receptors are defined as people, living organisms, ecological systems, controlled waters, atmosphere, structures and utilities that could be adversely affected by contaminant(s).

4.9 Under the Construction Design Management (CDM) Regulations 2015, construction and maintenance contractors must undertake their own risk assessments and mitigation to protect their staff, other human receptors and the environment from potential contamination. By law potential risks to human health and the environment from construction activities must appropriately identified and all necessary steps taken to eliminate/manage that risk. Therefore, construction / maintenance workers are excluded as a receptor in the CSM.

Table 4:1 : Preliminary Conceptual Site Model (Road Corridor)

Source	Pathway	Receptor	Con	Prob	Risk
S1: Onsite: Potential Made Ground associated with the road network and farming activities. Potential contaminants may include metals, asbestos and PAHs.	**P1:** Direct contact, incidental ingestion, and inhalation of particulates.	**R1**: Site users	Md	Lw	M/L
	P2: Inhalation of fugitive dust.	**R2:** Site Neighbours	Md	Ul	L
	P3: Vertical migration of contaminants in the soil leachate through the unsaturated zone.	**R3:** Underlying Principal Aquifer	Md	Ul	L
	P4: Surface run-off.	**R4:** Aquatic ecosystems	Md	Lw	M/L
		R5: Surface water receptors and possible abstractors	Md	Ul	L
	P5: Base flow from contaminated groundwater.	**R4:** Aquatic ecosystems	Md	Lw	M/L
		R5: Surface water receptors and possible abstractors	Md	Ul	L
	P6: Direct contact.	**R6:** Water supply pipes	Md	Ul	L
	P7: Root uptake.	**R7:** Landscape planning	Mr	Lw	VL
S2: Onsite – Herbicides / pesticides / agrochemicals used historically on farms and stored in storage facilities. Potential contaminants may include pesticides and herbicides.	**P1:** Direct contact, incidental ingestion, and inhalation of particulates.	**R1**: Site users	Md	Ul	L
	P2: Inhalation of fugitive dust.	**R2:** Site Neighbours	Md	Ul	L
	P3: Vertical migration of contaminants in the soil leachate through the unsaturated zone.	**R3:** Underlying Principal Aquifer and possible abstractors	Md	Ul	L
	P4: Surface run-off.	**R4:** Aquatic ecosystems	Md	Lw	M/L
		R5: Surface water receptors and possible abstractors	Md	Lw	M/L
	P5: Base flow from contaminated groundwater.	**R4:** Aquatic ecosystems	Md	Ul	L
		R5: Surface water receptors and possible abstractors	Md	Ul	L
		R5: Surface water receptors and possible abstractors	Md	Lw	M/L

5. PHASE II ENVIRONMENTAL AND GEOTECHNICAL GROUND INVESTIGATION

5.1 Intrusive ground investigation works were undertaken between 12/09/2022 and 16/09/2022 and comprised the following works:

- Clearance of investigation locations by a specialist buried services tracing company;
- Collection of coordinates and elevations of exploratory hole locations;
- The advancement of nineteen machine excavated trial pits (TP161 to TP189) to a maximum depth of 2.07m bgl;
- Collection of environmental soil and groundwater water samples for chemical analysis at a UKAS and MCERTS accredited laboratory;
- Collection of bulk and disturbed soil samples for geotechnical analysis at a UKAS accredited laboratory.

5.2 An exploratory hole location plan is presented as Drawing 1. Exploratory hole records are presented on the Factual Ground Investigation Report as Appendix 2.

5.3 The site investigation works were carried out in general accordance with BS5930:2015 'Code of Practice for Site Investigations' and BS10175:2011 'Investigation of Potentially Contaminated Sites'.

Chemical Sampling Strategy

5.4 The preliminary CSM has not identified significant point contamination sources along the proposed road alignments. Therefore, the sampling strategy was designed to generally understand the initial contamination status across the site, where no Made Ground deposit had been previously identified. Locations were generally selected to provide coverage based on access restrictions and considering possible locations of more significant road infrastructure (e.g. bridge abutments).

Chemical Analytical Strategy

<u>Soil Strategy</u>

5.5 Selected soil samples collected from exploratory hole locations were sent to i2 Analytical Testing Services (UKAS and MCERTS accredited) for chemical analysis. The following chemical analytical testing was undertaken:

- Seventeen soil samples tested for a soil suite (BWB Standard Suite) comprising arsenic, barium, beryllium, water soluble boron, cadmium, chromium, hexavalent chromium, copper, lead, mercury, nickel, selenium, vanadium, zinc, water soluble sulphate (2:1 extract), total phenols, total cyanide, free cyanide, complex cyanide, fraction of organic carbon, pH, Polycyclic Aromatic Hydrocarbons (PAHs) (United States Environment Protection Agency priority 16 compounds) and Total Petroleum Hydrocarbons (TPH) C6-C40;

- Two soil samples tested for TPH speciated to the UK Criteria Working Group (TPHCWG) aliphatic and aromatic compounds;
- Six soil samples for herbicide and pesticide screening;
- Three soil samples for asbestos screening; and
- Seven soil samples tested for a suite of common leachable contaminants, namely arsenic, barium, beryllium, water soluble boron, cadmium, chromium, copper, lead, mercury, nickel, selenium, vanadium, zinc, water soluble sulphate (2:1 extract), sulphate, total cyanide and pH.

5.6 The results of the soil chemical testing are presented as **Appendix 4** within the Factual Ground Investigation Report (Appendix 2).

Geotechnical Strategy

5.7 The trial pits were positioned to cover the area of the proposed road corridors, along the preliminary route chosen for the flow link to the M40, Ardley Bypass to the north of the site and along Middleton Stoney Relief Road to the south.

5.8 Selected disturbed and bulk samples were collected from the investigation locations and sent to the geotechnical project laboratory (i2 Analytical Testing Services), which is UKAS accredited. The following geotechnical testing was undertaken;

- Twelve samples tested for moisture content;
- Five samples tested for Atterberg (liquid and plastic) limits;
- Six samples tested for particle size distribution by wet sieve;
- Two samples tested for Particle Density by Gas Jar Method.
- Seven samples tested for BRE Suite comprising aqueous sulphate and pH; and
- Four samples (two 2.5kg and two 4.5kg) tested for compaction testing.

5.9 The results of the geotechnical testing are included as Appendix 3 of the Factual Report (**Appendix 2)**.

Limitations and Uncertainty

5.10 Exploratory hole excavation depth was limited to a maximum of 2.01m bgl due to the presence of shallow limestone bedrock and the stiffness / high density of the weathered limestone.

5.11 Atterberg (liquid and plastic) limit testing on samples recovered from TP168 at 1.30m depth was not undertaken due to the non-plastic state of the sample.

6. GROUND CONDITIONS ENCOUNTERED

Geological Summary

6.1 The ground investigation undertaken on the site by BWB and third parties confirmed the anticipated sequence of ground conditions indicated by BGS mapping. Ground conditions generally comprised topsoil overlying slightly clayey to clayey, sandy, limestone gravel with low to medium cobble and boulder contents. No Made Ground was encountered.

6.2 The recorded ground conditions are summarised in **Table 6:1**:

Table 6:1 : Summary of Ground Conditions

Stratum	Top Depth (m)		Base Depth (m)		Thickness (m)	
	Min	Max	Min	Max	Min	Max
Topsoil	0.00	0.00	0.20	0.31	0.20	0.31
Gravel (weathered bedrock)	0.20	1.00	0.45	1.60	0.19	1.40
Clay (gravelly, sandy)	0.20	1.40	0.41	1.95	0.30	1.75
White Limestone Formation	0.88	1.00	NP	NP	NP	NP
NP=Not Proven						

Geological Descriptions

Topsoil

6.3 Topsoil was encountered consistently across the site, generally at thicknesses of between 0.20m and 0.31m. The composition also displayed consistency, typically comprising dark brown, slightly gravelly, sandy clay with rootlets. Topsoil comprising soft brown to dark brown clayey gravelly sand with rootlets was generally recorded in the east and southeast of the site, with cobble inclusions noted in TP161, west of the B340 by the Middleton Stoney Relief Road corridor.

6.4 The depth of topsoil over the site may vary from that encountered at the locations investigated within the scope of this investigation which may result in inaccurate estimations of topsoil quantities on the site.

Clay Sub Soil

6.5 Clay strata was encountered in seven of the trial pits. It mainly comprised of a stiff, reddish brown, slightly gravelly, sandy clay. The gravel within this strata was angular to subangular of limestone.

6.6 This strata was encountered overlying and underlying the gravel strata, generally at a thickness of between 0.30 and 1.75m.

Gravel (Weathered Bedrock)

6.7 Gravel strata was encountered in all of the trial pits, generally at a thickness of between 0.19 and 1.40m.

6.8 It generally comprised of a light brown, slightly sandy, angular to subangular, fine to coarse gravel, with low boulder and medium cobble content. The boulders and cobbles were formed of weak limestone.

White Limestone Formation

6.9 The White Limestone Formation was encountered in six of the trial pits across the site, generally comprising very dense, creamy to greyish/orangish brown, slightly clayey, sandy gravel and gravelly sand with low to medium cobble and boulder content with clasts including limestone.

6.10 Cohesive layers were sparsely encountered throughout the site. The maximum thickness cohesive layer was recorded as 1.35m in TP161, by the Middleton Stoney Relief Road corridor, where it was recovered as a stiff orangish brown sandy clay. In the same area clay deposits were encountered in TP167 below granular deposits, recovered as stiff, grey, mottled brown, slightly gravelly, slightly sandy clay. TP165 recorded a firm light brown, slightly gravelly, slightly sandy clay layer topsoil.

6.11 Along the Ardley Bypass corridor, cohesive layers were encountered in TP174 as soft, reddish brown, slightly gravelly, sandy clay below the topsoil and in TP189 between 0.45m to 0.88m bgl recovered as stiff, orange mottled, grey, slightly gravelly sandy clay at 1.40m depth in TP177. Further north, a stiff orange mottled, grey, slightly gravelly, sandy clay with a low cobble content was encountered below topsoil to 1.00m bgl depth in TP185 location, positioned in the field east of the B43 in proximity of Baynards Green roundabout.

6.12 Six PSD tests were undertaken on samples from the White Limestone Formation, a summary of the results is provided in **Table 6:2** below. The PSD results obtained in trial pits are presented as Appendix 3 within the Factual Ground Investigation Report (**Appendix 2**).

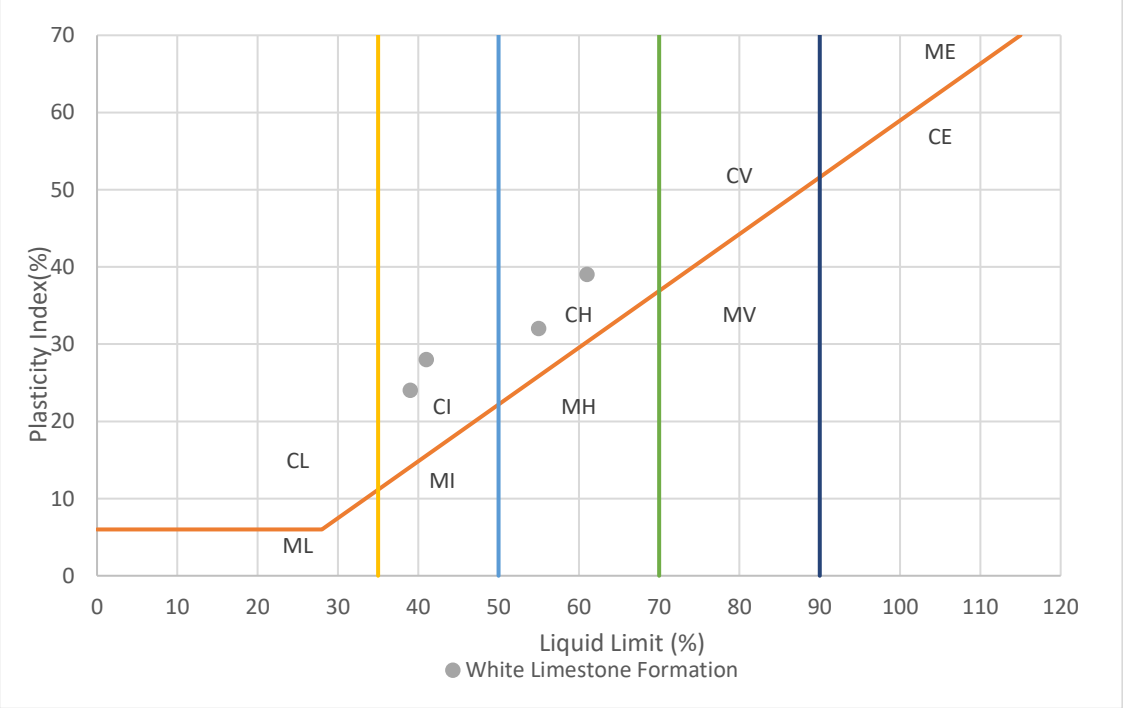
Table 6:2 : PSD Results Summary

Stratum	Location	Depth (m)	Cobble Content (%)	Gravel Content (%)	Sand Content (%)	Clay/ Silt Content (%)	Earthworks Classification
White Limestone Formation	TP179	0.2	0	12	51	37	2A&2B
White Limestone Formation	TP176	0.3	0	47	38	15	1A

Stratum	Location	Depth (m)	Cobble Content (%)	Gravel Content (%)	Sand Content (%)	Clay/ Silt Content (%)	Earthworks Classification
White Limestone Formation	TP166	0.3	0	37	17	47	2C
White Limestone Formation	TP185	0.5	0	52	17	31	2C
White Limestone Formation	TP180	0.5	0	23	15	62	2C
White Limestone Formation	TP170	0.7	11	46	23	20	2C

6.13 The geotechnical laboratory testing has indicated PIs to be in the range 24% (intermediate plasticity) and 39% (high plasticity). A Plasticity Chart is presented below as **Figure 6:1.**

Figure 6:1: Plasticity Chart



6.14 The geotechnical laboratory testing has indicated OMC to be in the range 13% and 18%. The OMC results obtained at trial pits are presented as Appendix 3 within the Factual Ground Investigation Report (**Appendix 2**).

Contamination Observations

6.15 No significant visual or olfactory contamination observations were noted during the intrusive investigation works.

7. GEOTECHNICAL ASSESSMENT

Introduction

7.1 This report focusses on preliminary Geo-environmental ground investigation and assessment of the proposed new access routes.

7.2 Ground conditions on the site have been recorded as Topsoil to a maximum thickness of 0.31m, overlying White Limestone Formation, typically encountered between 0.45m and 2.0m bgl. Made Ground was not encountered at this site.

7.3 Shallow groundwater was not encountered during the ground investigation.

Roads and Pavements

7.4 Based upon guidance within Interim Advice Note 73/06 (IAN73/06) Revision 1 2009, roads should be designed with CBR's of 4 - 5% when constructed above slightly gravelly sandy clay and fine to coarse gravel of the weathered White Limestone Formation. These should be confirmed by in-situ testing once detailed designs are available.

7.5 Limestone is likely to form a strong competent base for road construction, though it is frost susceptible and will likely require a minimum thickness of sub-base material of 450mm.

Drainage

7.6 Permeability testing has not been completed during this phase of investigation.

7.7 Soakaway drainage may be feasible at the Site depending on the permeability of the weathered limestone bedrock. Testing in accordance with BRE 365 guidance is recommended to confirm the drainage design.

Ease of Excavation

7.8 Excavations using backhoe excavators are expected to be suitable within shallow soils across the site. A breaker attachment may be required in areas where deeper excavation into the Limestone is required.

7.9 Excavation for services may be problematic given rock strength and competency and may require extended periods of breaking.

Stability of Excavation

7.10 Excavations displayed generally good stability during the site investigation although excavation may become unstable if left open for any significant periods. Where personnel entry is required for inspection; excavations should be sufficiently enlarged and an assessment of safe temporary angles should be made. Alternatively, temporary shoring should be provided.

Legislation on Personnel Entry to Excavations

7.11 It is recommended that no excavations should be entered without appropriate support and a full risk assessment should be completed prior to entry. Mitigation measures to protect from accumulating ground gases should be implemented.

Groundwater

7.12 Shallow groundwater was not encountered during the ground investigation.

7.13 It is anticipated that where groundwater is encountered, it should be readily managed via a sump and submersible pump.

Chemical Attack on Buried Concrete

7.14 Water soluble sulphate concentrations in soils varied from 0.0027g/l to 0.0067g/l with soil pH values ranging from 7.6 to 8.6. Total sulphur concentration ranged from 0.025% to 0.051%.

7.15 In accordance with the recommendations of BRE Special Digest 1, 'Concrete in Aggressive Ground' 2005, the conditions of the soils at the Site would therefore be classified as Design Sulphate Class DS-51 and ACEC Class AC-1s for soils and groundwater, when considering the most appropriate type of concrete to be used at the Site in order to resist chemical attack from elevated sulphate present in the soils (assuming mobile groundwater in non pyritic soils).

8. HUMAN HEALTH RISK ASSESSMENT

8.1 Chemical data has been compared to Land Quality Management Suitable for Use Levels (LQM S4ULs) for a commercial end use. The soil chemical laboratory results are presented as Appendix 4 within the Factual Ground Investigation Report (**Appendix 2**). Criteria includes reference to the LQM/CIEH S4ULs for Human Health Risk Assessment Copyright Land Quality Management Limited reproduced with permission; publication number S4UL3271.

8.2 The screening criteria have been applied with an organic matter content of 2.5% (based on an average SOM of 2.54%). This is considered to be more representative of shallow soils found on site.

Contamination Distribution

8.3 Generally low levels of contaminants have been recorded at the site. Heavy metal concentrations were recorded at low and relatively uniform concentrations across the site.

8.4 Very low Total TPH concentrations were recorded at the site (max 37mg/kg at 0.4m in SA03) with speciated TPH recording concentrations below the limits of detection. Speciated PAH concentrations were also recorded below the limits of detection.

8.5 Asbestos was not recorded in any of the samples analysed.

Pathways

8.6 Chemical data have been compared to GSAC for public open space end use based on an organic matter content of 2.5%. The wider site is to be developed for commercial end use with road alignments and the assessment focussed on the road network and therefore a public open space end use has been adopted. Exposure pathways considered in this assessment are presented in **Table 8:1**.

Table 8:1 : Commercial Exposure Pathways

Source	Shallow Soils		Deep Soils
Pathway	Public Open Space with managed landscaped areas	Public Open Space with Hard standing areas	Public Open Space
Ingestion of Soil	✓	×	×
Ingestion of site derived household dust	✓	×	×
Ingestion of contaminated vegetables	×	×	×
Ingestion of soil attached to vegetables	×	×	×
Dermal contact with Soil	✓	×	×
Dermal contact with site derived household dust	✓	×	×
Inhalation of fugitive soil dust	✓	×	×

Source	Shallow Soils		Deep Soils
Inhalation of fugitive site derived household dust	✓	×	×
Inhalation of vapours outside	✓	✓	✓
Inhalation of vapours inside	×	×	×

Risk Assessment

8.7 When compared to the screening sheets, all contaminants were recorded below the limits of detection.

8.8 No Asbestos was recorded within the shallow soils.

8.9 A risk to human health has not been identified associated with the proposed access road development.

9. CONTROLLED WATERS RISK ASSESSMENT

9.1 No groundwater or surface water testing has been undertaken as part of this assessment. However, soil leachability has been undertaken, the results of which are presented within **Appendix 7**.

9.2 The controlled waters assessment considers the potential impact of on-site contamination to pertinent controlled waters receptors identified at the site including:

- Secondary A Aquifer beneath the site within Alluvium superficial deposits;
- Secondary Undifferentiated Aquifer in the site within Head superficial deposits;
- Principal Aquifer beneath the site within the White Limestone Formation bedrock deposits;
- Principal Aquifer beneath the site within the Forest Marble Formation bedrock deposits;
- Secondary B Aquifer beneath the site within the Rutland Formation bedrock deposits;
- Several surface water features summarised in **Table 3:1**.

Pathways

9.3 Controlled water risk assessment has been undertaken through assessment of leachable concentrations of contaminants in soil referring to exposure pathways considered and referencing **Table 11:1**.

Table 9:1 : Controlled Water Exposure Pathways

Controlled Waters Exposure Pathway	Receptor
Leaching of soil contamination into recharge infiltration	✓
Vertical migration of impacted pore water through unsaturated zone into underlying aquifer	✓
Horizontal migration of groundwater through aquifer to off site receptors	✓

9.4 The site is underlain by Alluvium and the White Limestone Formation (Principal Aquifer). Therefore, in the absence of a sensitive potable supply it is considered appropriate to adopt environmental quality standards (EQS) for freshwater when assessing groundwater quality and soil leachate concentrations. Where EQS are not available, World Health Organisation Standards (WHO) and UK Drinking Water Standards (DWS) have been adopted as the relevant screening criteria.

Soil Leachability

9.5 The soil leachate concentrations have been compared to the environmental quality standards (EQS) for assessing the risks to the surface water receptors, and the UK Drinking Water Standards (UKDWS) to assess the risk to the underlying aquifers.

9.6 A summary of the soil leachate concentrations and adopted guideline concentrations are presented within **Appendix 5**.

9.7 When compared against the UKDWS criteria, none of the leachate concentrations are recorded as exceedances. Therefore, the site is not considered to represent a risk to the underlying aquifers.

9.8 When compared against the EQS criteria, marginal exceedances of several heavy metals have been recorded, as summarised in **Table 11:2**.

Table 9:2 : Summary of Leachable Contamination Exceedances

Leachable Contaminant	Concentration Range (µg/l)	EQS (µg/l)	No. of exceedances
Copper	4.30 – 13.00	1.00	7 of 7
Lead	3.00 – 4.90	1.20	7 of 7
Nickel	4.10 – 5.50	4.00	6 of 7
Zinc	4.8 – 13.0	10.9	2 of 7

9.9 Generally, the leachate concentrations are not considered significant with concentrations all recorded at a similar order of magnitude. The concentrations which are indicated to be exceedances are only marginally above their relevant screening criteria. Given the uniformity of the data, it is considered that the leachate concentrations are indicative of the natural strata background concentrations.

9.10 Considering that the development of the site will increase the hardstand cover it is considered that there is no significant pathway to the identified surface water receptors. Therefore, BWB consider the leachable contaminants do not represent a significant risk to controlled waters.

Summary

9.11 Given the lack of significant contamination sources identified within the shallow soils, a significant risk to groundwaters has not been identified. Whilst the controlled waters assessment has not identified significant contamination at the site, the investigation was preliminary in nature, and further works will be required to confirm the absence of contamination.

10. ENVIRONMENTAL RISK ASSESSMENT

Introduction

10.1 The preliminary conceptual site model presented in **Table 6.1** has been updated based on the risk assessment presented in **Section 9**.

10.2 The human health risk assessment has not identified a risk to the site associated with the proposed road network development.

10.3 The low leachate concentrations are not considered to represent a risk to controlled waters based on the road construction removing a viable migration pathway and the leachable concentrations being considered indicative of the natural strata background concentrations.

11. WASTE MANAGEMENT

Waste Classification

11.1 Soil samples have been characterised against hazardous waste criteria using Hazwasteonline. The results of the waste classification are presented in **Appendix 6**. The assessment indicates that the majority of the soils analysed are likely to be classified as non-hazardous, with one of seventeen samples being classified hazardous based on the concentration of zinc.

11.2 The elevated zinc concentration was recovered from TP189 at 0.2m in Topsoil strata. Consideration should be given to further testing should cut be required as part of the road construction in this area of the site.

11.3 The waste classification assessment only applies to those soils that have been tested. If other soils are to be disposed of off-site then further analysis may be required.

11.4 Asbestos has not been found at the site. The presence of visible asbestos containing materials in waste or at concentrations exceeding 0.1% by weight will classify the waste as mixed and require disposal as hazardous waste irrespective of the chemical properties of the waste.

11.5 Should any soils require disposal off site an assessment of waste classification of the soils for disposal should be made by a competent person. Further chemical analysis may be required to fully characterise waste soils for disposal to landfill or re-use off site. WAC analysis may be required for disposal of soils as inert or hazardous.

12. CONCLUSION AND RECOMMENDATIONS

Conclusions

12.1 Ground conditions at the site have been recorded as Topsoil to a maximum depth of 0.31m, overlying clay and gravel strata and the weathered White Limestone Formation. Competent bedrock was encountered at between 0.45m and 2.0m bgl. Shallow groundwater was not encountered during the ground investigation.

12.2 The site itself consists of a mixture of predominantly arable and pasture fields with small areas covered by Ashgrove farm, soil treatment facility and covered reservoir.

12.3 The surrounding land use includes the former Ardley Landfill and Upper Heyford Airfield.

Environmental

12.4 No risk to controlled waters has been identified through this assessment. However, the investigation is preliminary in nature, and further works will be required to confirm the absence of contamination following the clearance of the Site.

12.5 Waste classification assessment found one of the seventeen samples was classified as hazardous, based on zinc concentration. This could indicate localised contamination. Further testing may be required to confirm this should this material require disposal off site as part of any earthworks cut exercise.

Geotechnical

12.6 Limestone is likely to form a strong competent base for road construction, though it is frost susceptible and will likely require a minimum thickness of sub-base material of 450mm.

12.7 Soils would be classified as Design Sulphate Class DS-1 and ACEC Class AC-1s for soils and groundwater, when considering the most appropriate type of concrete.

12.8 Permeability testing has not been completed during this phase of investigation, but was completed in the same geology on the Main Site area. Soakaway drainage may be feasible at the Site depending on the permeability of the limestone bedrock.

Recommendations

12.9 Detailed geotechnical assessment will be required to manage geotechnical risks on the project including rock excavation and settlement issues. Supplementary ground investigation works may be required once development plans are finalised although no significant contamination issues are anticipated. These could be undertaken alongside any future ground investigation to manage geotechnical risk

12.10 Liaison with Network Rail will be required to manage geotechnical risk on the interfaces with their infrastructure.

12.11 Soakaway testing in line with BRE 365 guidance is recommended to inform the detailed drainage design once attenuation locations have been confirmed.

13. REFERENCES

1. British Standards Institution, (BSI), BS 8485:2015+A1:2019, Code of Practice for the characterization and remediation from ground gas in affected developments

2. British Standards Institution, (BSI), BS 8576:2013, Guidance on investigations for ground gas – Permanent gases and Volatile Organic Compounds (VOCs)

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4. British Standards Institution, (BSI), BS5930:2015+A1:2020 Code of practice for ground investigations

5. British Standards Institution, (BSI), BS EN 1997-1:2004+A1:2013, Incorporating corrigendum February 2009, Eurocode 7 – Geotechnical Design – Part 1: General rules.

6. British Standards Institution, (BSI), BS EN 1997-2:2007 Incorporating corrigendum June 2010, Eurocode 7 – Geotechnical Design – Part 2: Ground Investigation and testing.

7. Building Research Establishment Special Digest 1 *Third Edition*. Concrete in Aggressive Ground (2005)

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12. Department for Communities and Local Government (DCLG), 2012, National Planning Policy Framework.

13. Department for Environment Food and Rural Affairs (DEFRA), 2012, Environmental Protection Act 1990: Part 2A Contaminated Land Statutory Guidance.

14. Environment Agency report Land Contamination Risk Management, 2020.

15. Environment Agency 2008, Updated technical background to the CLEA model Science Report – SC050021/SR3

16. Environment Agency 2008, Human health toxicological assessment of contaminants in soil Science Report – SC050021/SR2

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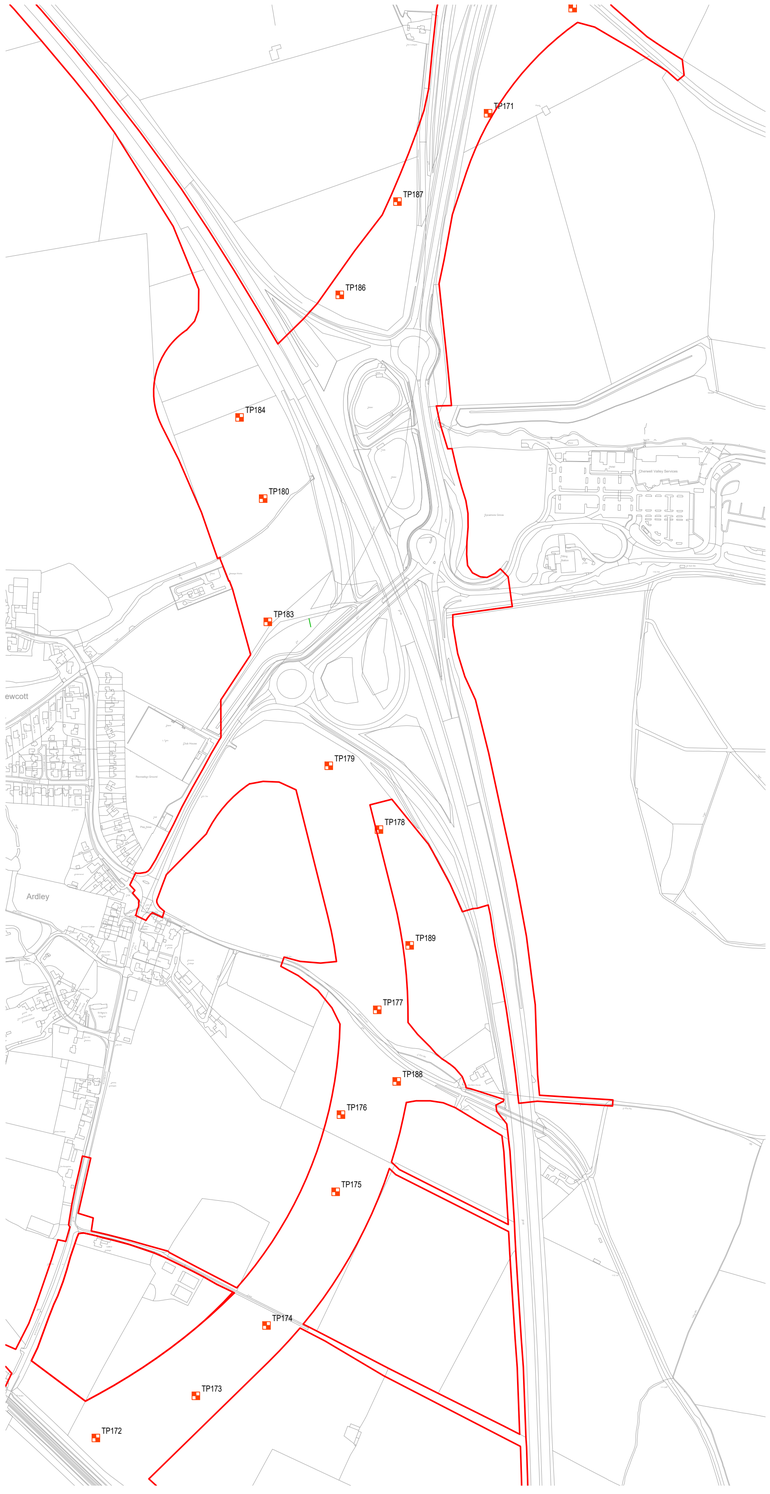
18. Environment Agency 2008, A review of body weight and height data used within the Contaminated Land Exposure Assessment model (CLEA) Project SC050021/ Technical Review 1

19. Environment Agency, 2006, Remedial Targets Methodology, Hydrogeological Risk Assessment for Land Contamination

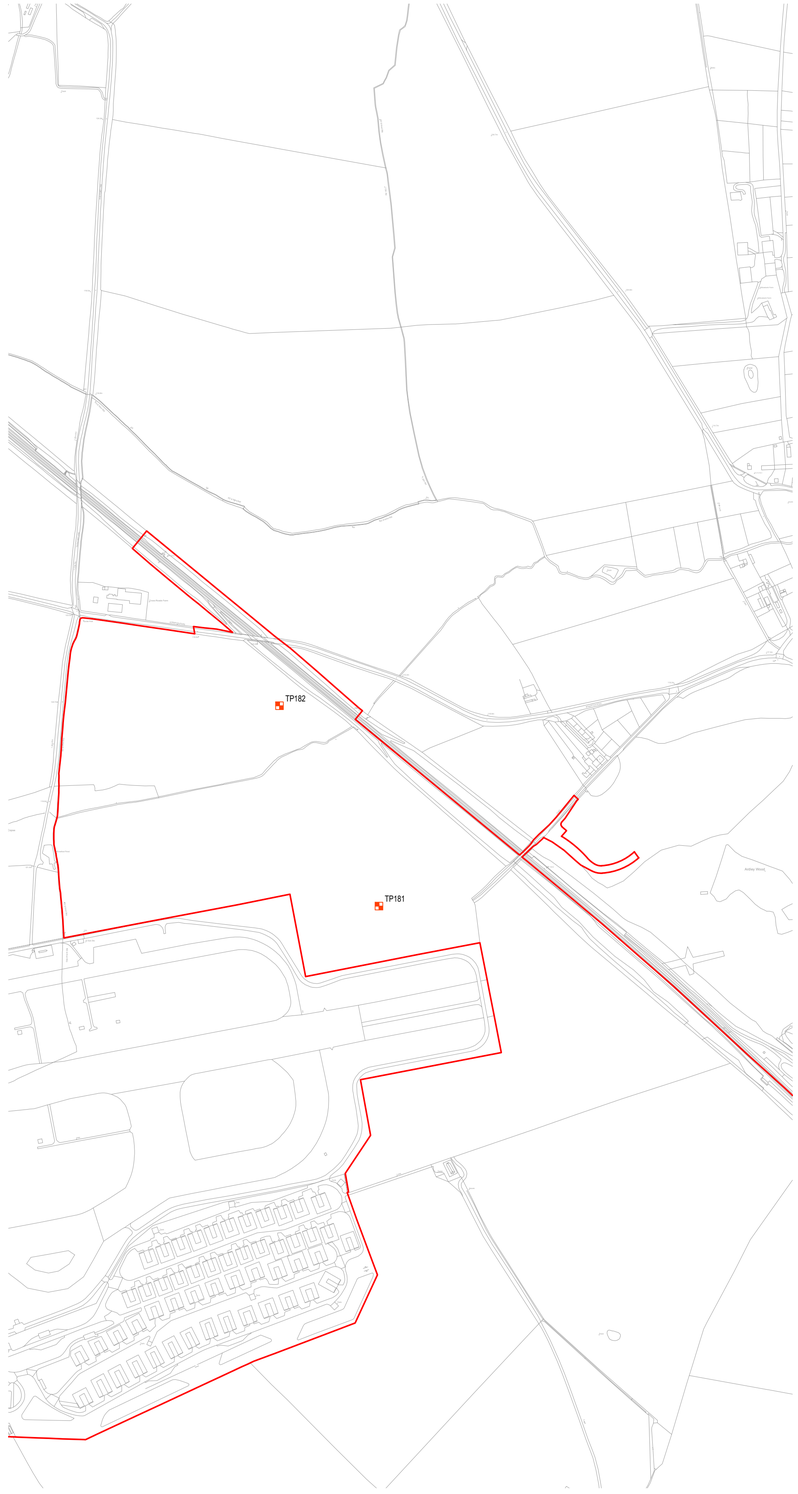
20. Health and Safety Executive (HSE) 'Protection of workers and the general public during the Development of Contaminated Land (1991).

DRAWINGS

Drawing 1 : Exploratory Hole Location Plan







Notes

1. Do not scale this drawing. All dimensions must be checked/ verified on site. If in doubt ask.
2. This drawing is to be read in conjunction with all relevant architects, engineers and specialists drawings and specifications.
3. All dimensions in millimetres unless noted otherwise. All levels in metres unless noted otherwise.
4. Any discrepancies noted on site are to be reported to the engineer immediately.

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Key Plan

ISSUES & REVISIONS

Rev	Date	Details of issue / revision	Drw	Rev
P1	01.01.00	PRELIMINARY ISSUE	AJ	JB

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Client
Oxfordshire Railfreight Ltd

Project Title
Oxfordshire RFI

Drawing Title
Exploratory Hole Location Plan - Road Corridors

Drawn:	M. Marteddu	Reviewed:	R. Robinson	
BWB Ref:	NTH2479	Date:	22.09.22	Scale@A1: 1:4,000

Drawing Status: **Draft**

Project - Originator - Zone - Level - Type - Role - Number: **ORFI-BWB-ZZ-XX-DR-GE-0002**

Status: **S0** Rev: **P4**

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APPENDICES

Appendix 1 : CIRIA Risk Classification Scheme

BWB RISK ASSESSMENT CLASSIFICATION (REFERENCE CIRIA C552, *CONTAMINATED LAND RISK ASSESSMENT: A GUIDE TO GOOD PRACTICE*, 2001)

CIRIA C552, *Contaminated Land Risk Assessment A Guide to Good Practice*, 2001 sets out a methodology for estimating risk. The methodology for risk evaluation is a qualitative method for interpreting the output for the risk estimation stage of the assessment. It involves the classification of the:

- Magnitude of the potential consequence (severity) of risk occurring; and
- Magnitude of the probability (likelihood) of the risk occurring.

The classification of consequence and probability are replicated in **Table 1** and **Table 2**, respectively.

Table 1: Classification of Consequence

Classification	Definition	Examples
Severe (Sv)	Short term (acute) risk to human health likely to result in "significant harm" as defined by the Environment Protection Act 1990, Part IIA. Short term risk of pollution of sensitive water resource. Catastrophic damage to buildings/ property. A short-term risk to a particular ecosystem, or organism forming part of such ecosystem.	High concentrations of cyanide on the surface of an informal recreation area. Major spillage of contaminants from site into controlled water. Explosion, causing building collapse (can also equate to a short-term human health risk if buildings are occupied).
Medium (Md)	Chronic damage to Human Health ("significant harm"). Pollution of sensitive water resources. A significant change in a particular ecosystem, or organism forming part of such ecosystem.	Concentrations of a contaminant from site exceeding the generic or site-specific assessment criteria. Leaching of contaminants from a site to a major or minor aquifer. Death of species within a designated nature reserve.
Mild (Mi)	Pollution of non-sensitive water resources. Significant damage to crops, buildings, structures and services. Damage to sensitive buildings/structures/services or the environment.	Pollution of non-classified groundwater. Damage to building rendering it unsafe to occupy (e.g. foundation damage resulting in instability).
Minor (Mr)	Harm, although not necessarily significant harm, which may result in a financial loss, or expenditure to resolve. Non-permanent health effects to human health (easily prevented by measures such as protective clothing etc.). Easily repairable effects of damage to buildings, structures and services.	The presence of contaminants at such concentration that protective equipment is required during site works. The loss of plants in a landscaping scheme. Discolouration of concrete.

The classification of consequence does not take into account the probability of the consequence being realised. Therefore, there may be more than one consequence for a particular pollutant linkage. Both a severe and medium classification can result in death.

Severe relates to short term (acute) risk while medium relates to long term (chronic) risk. Mild relates to significant harm but to less sensitive receptors. Minor classification relates to harm which is not significant but could have a financial cost.

Table 2: Classification of Probability

Classification	Definition
High likelihood (Hi)	There is a pollutant linkage and an event that either appears very likely in the short term and almost inevitable in the long term, or there is evidence at the receptor of harm or pollution.
Likely (Li)	There is a pollutant linkage and all the elements are present and in the right place, which means that it is probable that an event will occur. Circumstances are such that an event is not inevitable, but possible in the short term and likely over the long term.
Low likelihood (Lw)	There is a pollutant linkage and circumstances are possible under which an event could occur. However, it is by no means certain that even over a longer period such event would take place, and is less likely in the shorter term.
Unlikely (Ul)	There is a pollutant linkage but circumstances are such that it is improbable that an event would occur even in the very long term.

The classification gives a guide as to the severity and consequence of identified risk when compared with other risk presented on the site. It should be noted that if a risk is identified it cannot be classified as "no risk" but as "very low risk". Differing stakeholders may have a different view on the acceptability of a risk.

Once the consequence and probability have been classified these can be compared using a matrix to identify an overall risk category, as shown in **Table 3**. These categories and the actions required are categorised in **Table 4**.

Table 3: Risk Evaluation Matrix

	Consequence	Severe (Sv)	Medium (Md)	Mild (Mi)	Minor (Mr)
Probability	**High likelihood (Hi)**	Very High Risk (VH)	High Risk (H)	Moderate Risk (M)	Mod/Low Risk (M/L)
	Likely (Li)	High Risk (H)	Moderate Risk (M)	Mod/Low Risk (M/L)	Low Risk (L)
	Low likelihood (Lw)	Moderate Risk (M)	Mod/Low Risk (M/L)	Low Risk (L)	Very Low Risk (VL)
	Unlikely (Ul)	Mod/Low Risk (M/L)	Low Risk (L)	Very Low Risk (VL)	Very Low Risk (VL)

Table 4: Risk Categorisations

Very High Risk (VH)	There is a high probability that severe harm could arise to a designated receptor from an identified hazard, OR, there is evidence that severe harm to a designated receptor is currently happening. This risk, if realised, is likely to result in a substantial liability. Urgent investigation (if not undertaken already) and remediation are likely to be required.
High Risk (H)	Harm is likely to arise to a designated receptor from an identified hazard. Realisation of the risk is likely to present a substantial liability. Urgent investigation (if not undertaken already) is required and remedial works may be necessary in the short-term and are likely over the longer-term.
Moderate Risk (M)	It is possible that harm could arise to a designated receptor from an identified hazard. However, it is either relatively unlikely that any such harm would be severe, or if any harm were to occur it is more likely that the harm would be relatively mild. Investigation (if not already undertaken) is normally required to clarify the risk and to determine the potential liability. Some remedial works may be required in the longer-term.
Low Risk (L)	It is possible that harm could arise to a designated receptor from an identified hazard, but it is likely that this harm, if realised, would at worst normally be mild.
Very Low Risk (VL)	There is a low possibility that harm could arise to a receptor. In the event of such harm being realised it is not likely to be severe.

Reference:

CIRIA C552 *Contaminated land risk assessment. A guide to good practice*. Rudland, D J, Lancefield, R M, Mayell, P N, 2001.

Appendix 2 : Factual Ground Investigation Report

EXPLORATION
& TESTING ASSOCIATES

Factual Ground Investigation Report

Oxfordshire RFI
Ardley, Oxon
Second Phase Investigation

BWB Consulting Ltd

November 2022



EXPLORATION
& TESTING ASSOCIATES

Factual Ground Investigation Report

Oxfordshire RFI
Ardley, Oxon

Contract: C10172
Reference: C10172-FGIR-01

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Issue:	Date:	Description:
P01	08/11/22	First issue

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EXECUTIVE SUMMARY

Site Address	The site is located between the villages of Baynards Green and Middleton Stoney in the rural district of Cherwell, Oxfordshire.
Proposed Development	It is understood that the site is to be developed as a distribution hub, to include a strategic rail freight interchange and new road infrastructure linking the site to the main local highways.
Current Site Use	The overall site consists of active farms comprising pasture and arable fields, undeveloped land, woodlands, road infrastructure, a railway line, a composting facility, and a reservoir.
Published Geology	The published geology indicates the site to be underlain by bedrock of the Great Oolitic Group. Superficial deposits of Alluvium and Head are shown to be deposited across the north, central and southern portions of the site. Made Ground is indicated in the central east and north-west associated with an old landfill and railway, respectively.
Intrusive Works	Intrusive works consisted of 29 No. machine excavated trial pits.
Sampling and Testing	Chemical and geotechnical laboratory testing was carried out on selected samples, as scheduled by the Client.
Disclaimer. This Executive Summary should be read in conjunction with Exploration & Testing Associates Limited's Factual Ground Investigation Report, reference C10172-FGIR-01, of which it forms part.	

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TABLE OF CONTENTS

1.0 INTRODUCTION 3
1.1 Introduction 3
1.2 Scope of Work 3
2.0 SITE DESCRIPTION 4
2.1 Site Location 4
2.2 Site Description 4
2.2.1 Wider Site 4
2.2.2 Area of Investigation 4
Second Phase 4
3.0 INVESTIGATION WORKS 5
3.1 Intrusive Investigation 5
3.2 Sampling Strategy 5
4.0 GROUND CONDITIONS 6
4.1 Published Geology 6
4.2 Recorded Ground Conditions 6
4.3 Groundwater 7
4.4 Obstructions 7
4.5 Contamination 7
5.0 LABORATORY TESTING 8
5.1 Testing Strategy 8
5.2 Geotechnical and Chemical Laboratory Testing 8
6.0 REFERENCES 10

APPENDICES

APPENDIX 1: Drawings
APPENDIX 2: Engineering Records
APPENDIX 3: Geotechnical Laboratory Testing
APPENDIX 4: Chemical Laboratory Testing

1.0 INTRODUCTION

1.1 Introduction

Exploration & Testing Associates Limited (Exploration) was instructed by BWB Consulting (the Client), to undertake a ground investigation at the site known as Oxfordshire RFI. The investigation was undertaken to establish the current ground conditions, geotechnical properties of soils at the site and to determine the presence of contamination.

The site is proposed for development as a distribution hub, to include a new strategic rail freight interchange and new road infrastructure linking the site to the main local highways.

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The information contained within this report is based on conditions at the time of investigation and there may be site factors which have not been disclosed within this document. It should be noted that groundwater levels may vary due to seasonal or other conditions.

1.2 Scope of Work

The scope of work was set out by the Client at tender stage and included the following:

- Service clearance and surveying of all locations;
- Unexploded ordnance (UXO) supervision;
- 28 No. trial pits (TP) excavated to a maximum depth of 3.5 m bgl;
- Geotechnical laboratory testing; and
- Chemical laboratory testing;

Due to access constraints, the whole site area could not be investigated during the first phase of ground investigation undertaken between the 9th and 23rd September 2021. A second phase of ground investigation was undertaken on the 9th and the 12th to 16th September 2022, to investigate the remaining wider site area.

This document provides a factual account of the work undertaken and presents the data obtained during the course of the second phase of investigation.

2.0 SITE DESCRIPTION

2.1 Site Location

The site is located between the villages of Baynards Green and Middleton Stoney in the rural district of Cherwell, Oxfordshire and is approximately centred at National Grid co-ordinates 453183, 225643. A site location plan showing the wider site outline and the current investigated area is presented in Appendix 1 as drawing C10172_SLP_01.

2.2 Site Description

2.2.1 Wider Site

The overall site is irregular in shape and covers an area of approximately 480 hectares (ha). The land generally consists of arable and pasture fields associated with active farms, localised woodlands, ponds and reservoirs. Local roads, motorways and surface watercourses transect and divide portions of the site. A railway line and associated cuttings transect the northern third of the site, orientated south-east to north-west.

The topography of the wider site area generally decreases in elevation from the north to the south and is generally surrounded by a mixture of agricultural land, residential and commercial developments, and associated infrastructure. Facilities including an incineration plant, waste and recycling depot and aggregate quarry are located directly to the east of the site. Directly to the west of the site is an inactive historical airfield and munitions facility including a business park and residential housing.

2.2.2 Area of Investigation

Second Phase

The areas of the site covered by the second phase of investigation works focused generally on the northern and southern wider site area. These areas were generally irregular in shape and overall covered approximately 216ha. At the time of the investigation this area consisted of several working farms divided between six landowners and comprised of a mixture of pasture and arable fields and associated infrastructure. The arable fields were recently harvested. Fields were generally divided with mature hedgerows or wire and post fencing.

The topography of the investigated site area generally slopes down from the north to the south, this significant change in elevation is approximately 25m.

Underground water mains (18" diameter metal and plastic) associated with the reservoir are shown on utility drawings to go in all directions extending past the overall site boundaries. Surface water drains are present between field boundaries in the central north-east and central west to the south. Electricity cables were noted on service drawings in the southern portions of the site.

Access to the investigated areas could be gained via farm gates or gaps in hedgerows off the B430 or Camp Road.

3.0 INVESTIGATION WORKS

3.1 Intrusive Investigation

The second phase of intrusive investigation on the 9th and between the 12th to 16th September 2022 and was undertaken in general accordance with published guidance BS 5930:2015+A1:2020 and BS 10175:2011+A2:2017.

The completed investigations comprised the following:

- Service clearance of high-risk locations using a third-party service clearance contractor;
- Ecological clearance of potential ecological sensitive locations using a third-party ecologist contractor;
- 1 No. days of unexploded ordnance (UXO) supervision;
- 28 No. machine excavated trial pits were completed to a maximum depth of 2.07m bgl; and
- Collection of disturbed and environmental soil samples for chemical and geotechnical analysis.

The exploratory hole locations were set out based on co-ordinates provided by the Client and in liaison with the Client and the current landowners. Exploration undertook a post ground investigation survey in order to establish the precise location of all exploratory hole locations.

An overall Exploratory Hole Location Plan is provided in Appendix 1 as drawing C10172_EHLP-03 and updated co-ordinates are included on the exploratory hole records presented in Appendix 2.

3.2 Sampling Strategy

Representative disturbed soil samples were taken at the depths shown on the exploratory hole records. Soil samples for contamination testing were collected in appropriate containers and retained in cool boxes prior to dispatch to the laboratory. A summary of the laboratory testing is included within Section 5.0 of this report.

4.0 GROUND CONDITIONS

4.1 Published Geology

The published geology for the wider site area, based on records provided by the British Geological Survey (BGS), indicates the site to be directly underlain by bedrock of the Great Oolitic Group, described by the BGS as a 'variety of mudstone-dominated and ooidal, bioclastic and fine-grained limestone formations. The formations shown to outcrop across the site include the White Limestone Formation, Forest Marble Formation and Rutland Formation, which derive from the parent strata of the Great Oolitic Group.

The published geology shows narrow strips of Alluvium deposited in the central and southern sections of the site, orientated north to south bending round to the south-east. Alluvium is shown in the north of the site, transecting west to east. Head deposits are also mapped at the surface in the north-west of the site.

The published geology shows an area infilled ground within the central eastern portion of the site, associated with a wider area directly offsite to the south-east. Infilled ground is described by the BGS as 'an area where the pre-existing land surface has been excavated (worked ground) and subsequently partially or wholly backfilled (made ground)'.

The BGS map also indicates Made Ground to be present on site, associated with the railway cutting and artificial deposits associated with the airfield, quarry, and services stations along the boundaries in the north-west, central west, east and north-east.

There is the also potential for Made Ground to be present under areas of hardstanding associated with the existing farm, compositing facility, reservoir and backfill from the installation of large diameter water mains transecting the central portion of the site.

An inferred geological fault is shown to transect the north-western corner and northern portion of the site, trending west to northeast and downthrown to the north.

There are numerous BGS boreholes and trial pits associated with the M40 and A43 located in the northern portion of the site. These BGS boreholes and trial pits generally indicate shallow limestone interpreted as the Great Oolitic Group.

4.2 Recorded Ground Conditions

The overall ground conditions were generally recorded to comprise Topsoil overlying slightly clayey to clayey, sandy, limestone gravel/gravelly sandy clay with low to medium cobble and boulder contents onto to weathered limestone bedrock.

Investigation in the northern portions of the site encountered in TP185, soft sandy clay topsoil, overlaying stiff sandy clay to 1.00m bgl with limestone gravel to a depth of 1.35m bgl.

No made ground was encountered during the second phase of investigation.

The depths of the exploratory holes and descriptions of strata encountered are provided on the exploratory hole records presented in Appendix 2.

4.3 Groundwater

No groundwater was encountered during the second phase of investigation.

4.4 Obstructions

All the trial pits were terminated in advance of the target depth due to hard strata.

4.5 Contamination

No visual or olfactory evidence of contamination was noted during the ground investigation.

5.0 LABORATORY TESTING

5.1 Testing Strategy

The chemical and geotechnical laboratory testing was scheduled by the Client based on material descriptions, taking into consideration the proposed development, the presence of visual or olfactory evidence of contamination and the site's history.

5.2 Geotechnical and Chemical Laboratory Testing

All soil samples for geotechnical testing were prepared in accordance with BS 1377-1:2016 by a UKAS accredited laboratory, with representative sub-samples taken for testing as necessary.

All chemical testing for soil, leachate and water samples was carried out by a UKAS accredited laboratory, in accordance with the MCERTS performance standard, with representative sub-samples taken for testing as necessary.

Geotechnical laboratory results are provided in Appendix 3 as test report L22-974.

Chemical laboratory results are provided in Appendix 4 as test reports 22-86042 and 22-87268. A summary of the geotechnical and chemical laboratory testing undertaken is presented in Table 5.1.

Table 5.1 Summary of geotechnical and chemical laboratory testing

Quantity	Laboratory test type	Test details
Geotechnical (Soil)		
12	Moisture content (BS EN 17892)	
5	Atterberg Limits	
6	Particle size distribution by wet sieve, with sedimentation by pipette, if fines over 15%	
2	Particle Density by Gas Jar Method	
2	Compactions by 2.5kg rammer	
2	Compaction by 4.5kg rammer	
Chemical (Soil)		
17	BWB standard suite	arsenic, barium, beryllium, boron (water soluble), cadmium, chromium (total and hexavalent) copper, lead, mercury, nickel, selenium, vanadium, zinc, total sulphur, sulphate as SO4, total cyanide, free cyanide, complex cyanide, pH, PAH, TPH-EPH (C10-C40), TPH-PRO/VPH (C6-C10), total phenols, organic matter.
2	TPH CWG with BTEX	

Quantity	Laboratory test type	Test details
6	LC Acid Herbicide Suite	
6	Pesticide Screen	
3	Asbestos Screen	
7	BRE SD1 Suite B (Soil)	pH, sulphate (water soluble and total), sulphur (total)
Chemical (Leachate)		
7	BWB standard leachate suite	arsenic, barium, beryllium, boron, cadmium, chromium (total and hexavalent) copper, lead, mercury, nickel, selenium, vanadium, zinc, sulphate as SO4, total cyanide, pH

6.0 REFERENCES

BS 5930:2015+A1:2020 '*Code of practice for ground investigations*.' British Standards Institute, 2020.

BS 10175:2011+A2:2017 '*Investigation of potentially contaminated sites. Code of practice'*, British Standards Institute, 2017

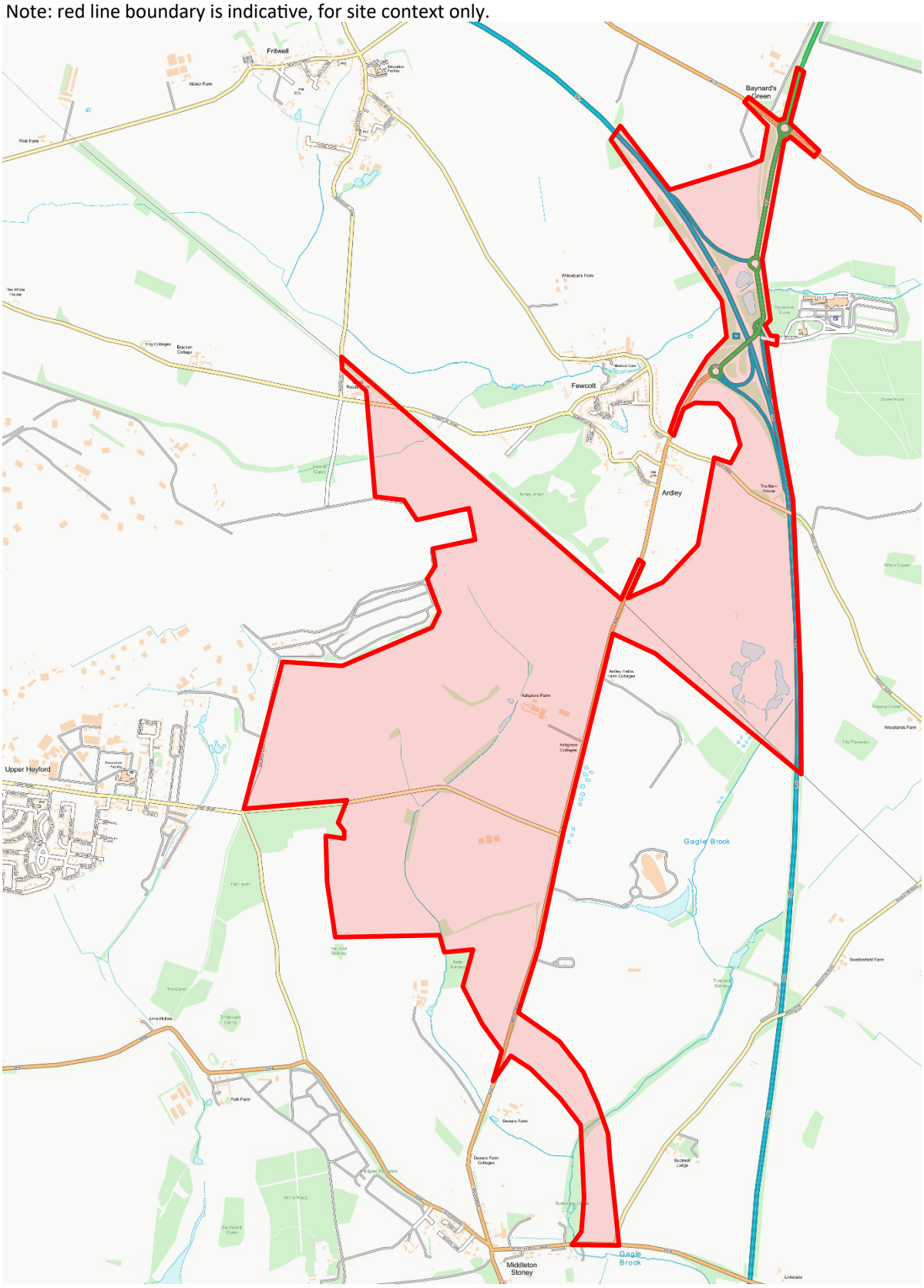
BS 1377-1:2016, '*Methods of test for soils for civil engineering purposes — Part 1: General requirements and sample preparation*', British Standards Institute, 2016

British Geological Survey, Sheet No. 218, 'Chipping Norton', bedrock and superficial, 1:63 360 scale, published 2012 and British Geological Survey, Sheet No. 219, 'Buckingham', bedrock and superficial, 1:50 000 scale, published 2012

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APPENDIX 1: DRAWINGS

Note: red line boundary is indicative, for site context only.



Client:	BWB Consulting Ltd
Contract:	Oxfordshire RFI
Contract No.:	C10172
Title:	Site Location Plan
Drawing:	C10172.SLP_01
Date:	22/10/21

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Legend

1. Trial Pits
2. Site Boundary

Notes

Contract No: C10172

Contract Name: Oxfordshire

Client: BWB Consulting Ltd

Title: Exploratory Hole Location Plan

Drawing Reference: C10172-EHLP_03 Phase II

Drawn by: EMB

Date: 08/11/2022



Source: Google Earth Imagery (2022)

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APPENDIX 2: ENGINEERING RECORDS

Trial Pit Log

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Project Name: Oxfordshire RFI	Client: BWB Consulting Ltd	Date: 15/09/2022
Location: Oxfordshire	Contractor: Exploration & Testing	Co-ords: E453566.92 N224530.20
Project No. : C10172	Crew Name: T&A Cox	Equipment: JCB 3CX

Location Number	Location Type	Level	Logged By	Scale	Status
TP161	TP	104.54m AoD	HBW	1:10	FINAL

Backfill	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.10	ES1					Soft dark brown slightly sandy gravelly CLAY with frequent rootlets and a low cobble content. Sand is fine and medium. Gravel is angular to subangular fine to coarse limestone. Cobbles are angular to subangular limestone. (TOPSOIL).
		0.20	D1		0.23	104.31		
		0.30	D2					Light brown slightly sandy angular to subangular fine to coarse GRAVEL of limestone with a medium cobble and a low boulder content. Cobbles and boulders are angular to subangular limestone.
		0.30 - 0.60	B1					
					0.65	103.89		Stiff orange mottled grey sandy CLAY. Sand is fine to coarse.
		0.80	D3					
		1.00 - 1.50	B2					
					1.95	102.59		End of Trial Pit at 1.95m

1

2

Dimensions		Trench Support and Comment			Water Stike General	
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Depth Strike	Date Time
1.80	0.60	Stable				

Remarks

1. Groundwater not encountered. 2. Terminated due to stiff clay. 3. No visual or olfactory evidence of contamination.

Trial Pit Log

EXPLORATION & TESTING ASSOCIATES

Project Name: Oxfordshire RFI	Client: BWB Consulting Ltd	Date: 15/09/2022
Location: Oxfordshire	Contractor: Exploration & Testing	Co-ords: E453735.34 N224433.03
Project No. : C10172	Crew Name: T&A Cox	Equipment: JCB 3CX

Location Number	Location Type	Level	Logged By	Scale	Status
TP162	TP	102.58m AoD	HBW	1:10	FINAL

Backfill	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.10	D1					Soft dark brown slightly gravelly sandy CLAY with frequent rootlets and rare wood. Sand is fine and medium. Gravel is angular to subangular fine to coarse limestone. (TOPSOIL).
		0.20 0.20 - 0.50	ES1 B1		0.20	102.38		Light brown slightly sandy angular to subangular fine to coarse GRAVEL of limestone with a high cobble content. Sand is fine and medium. Cobbles are angular to subangular limestone.
		0.40	D2					
		0.60	ES2		0.50	102.08		Creamish brown slightly sandy clayey angular fine to coarse GRAVEL of limestone with a low cobble and high boulder content. Cobbles and boulders are angular moderately strong limestone.
		0.80	D3					
					1.00	101.58		Weak to moderately strong light grey LIMESTONE. Recovered as light grey BOULDERS with many cobbles and some GRAVEL. Boulders and cobbles are up to 300mm of angular to subangular extremely weak to moderately strong limestone. Gravel is angular to subangular fine to coarse limestone.
					1.20	101.38		End of Trial Pit at 1.20m

1

2

Dimensions		Trench Support and Comment			Water Stike General	
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Depth Strike	Date Time
1.80	0.60	Stable				

Remarks

1. Groundwater not encountered. 2. Terminated due to tough digging on bedrock. 3. No visual or olfactory evidence of contamination.

Trial Pit Log

EXPLORATION & TESTING ASSOCIATES

Project Name: Oxfordshire RFI	Client: BWB Consulting Ltd	Date: 15/09/2022
Location: Oxfordshire	Contractor: Exploration & Testing	Co-ords: E453838.06 N224245.88
Project No. : C10172	Crew Name: T&A Cox	Equipment: JCB 3CX

Location Number	Location Type	Level	Logged By	Scale	Status
TP164	TP	96.22m AoD	HBW	1:10	FINAL

Backfill	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.15	ES1					Soft dark brown slightly gravelly sandy CLAY. Sand is fine and medium. Gravel is angular to subangular fine to coarse limestone. (TOPSOIL).
		0.25	D1					
		0.30 - 0.60	B1		0.28	95.94		Light brown slightly sandy clayey angular to subangular fine to coarse GRAVEL of limestone with a medium cobble and low boulder content. Cobbles and boulders are angular to subangular limestone.
		0.40	D2					
					0.66	95.56		Creamish brown slightly clayey sandy angular to subangular fine to coarse GRAVEL of weak to moderately strong limestone with a medium cobble and low boulder content. Cobbles and boulders are angular to subangular limestone.
		1.50	D3					
					1.60	94.62		Weak to moderately strong light grey LIMESTONE. Recovered as light grey BOULDERS with many cobbles and some GRAVEL. Boulders and cobbles are up to 300mm of angular to subangular extremely weak to moderately strong limestone. Gravel is angular to subangular fine to coarse limestone.

1

2

Dimensions		Trench Support and Comment			Water Stike General	
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Depth Strike	Date Time
1.80	0.60	Stable				

Remarks

1. Groundwater not encountered. 2. Terminated due to tough digging on bedrock. 3. No visual or olfactory evidence of contamination.

EXPLORATION & TESTING ASSOCIATES

Trial Pit Log

Project Name: Oxfordshire RFI	Client: BWB Consulting Ltd	Date: 15/09/2022
Location: Oxfordshire	Contractor: Exploration & Testing	Co-ords: E453838.06 N224245.88
Project No. : C10172	Crew Name: T&A Cox	Equipment: JCB 3CX

Location Number	Location Type	Level	Logged By	Scale	Status
TP164	TP	96.22m AoD	HBW	1:10	FINAL

Backfill	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					2.07	94.15		Weak to moderately strong light grey LIMESTONE. Recovered as light grey BOULDERS with many cobbles and some GRAVEL. Boulders and cobbles are up to 300mm of angular to subangular extremely weak to moderately strong limestone. Gravel is angular to subangular fine to coarse limestone.
								End of Trial Pit at 2.07m

3

4

Dimensions		Trench Support and Comment			Water Stike General	
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Depth Strike	Date Time
1.80	0.60	Stable				

Remarks

1. Groundwater not encountered. 2. Terminated due to tough digging on bedrock. 3. No visual or olfactory evidence of contamination.

EXPLORATION & TESTING ASSOCIATES

Trial Pit Log

Project Name: Oxfordshire RFI	Client: BWB Consulting Ltd	Date: 15/09/2022
Location: Oxfordshire	Contractor: Exploration & Testing	Co-ords: E453839.76 N224135.40
Project No. : C10172	Crew Name: T&A Cox	Equipment: JCB 3CX

Location Number	Location Type	Level	Logged By	Scale	Status
TP165	TP	93.34m AoD	HBW	1:10	FINAL

Backfill	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.10	ES1					Soft dark brown slightly gravelly sandy CLAY. Sand is fine and medium. Gravel is angular to subangular fine to coarse limestone. (TOPSOIL).
		0.20	D1		0.24	93.10		
		0.40	D2					Firm light brown slightly sandy slightly gravelly CLAY. Gravel is angular to subangular fine limestone.
		0.80	D3		0.54	92.80		Creamish brown sandy angular fine to coarse GRAVEL of limestone with a low cobble and high boulder content. Cobbles and boulders are angular weak to moderately strong limestone.
		1.00 - 1.30	B1		1.00	92.34		Weak to moderately strong light grey LIMESTONE. Recovered as light grey BOULDERS with many cobbles and some GRAVEL. Boulders and cobbles are up to 300mm of angular to subangular extremely weak to moderately strong limestone. Gravel is angular to subangular fine to coarse limestone.
					1.35	91.99		End of Trial Pit at 1.35m

1

2

Dimensions		Trench Support and Comment			Water Stike General	
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Depth Strike	Date Time
1.80	0.60	Stable				

Remarks

1. Groundwater not encountered. 2. Terminated due to tough digging on bedrock. 3. No visual or olfactory evidence of contamination.

Trial Pit Log

EXPLORATION & TESTING ASSOCIATES

Project Name: Oxfordshire RFI	Client: BWB Consulting Ltd	Date: 13/09/2022
Location: Oxfordshire	Contractor: Exploration & Testing	Co-ords: E454002.22 N223983.94
Project No. : C10172	Crew Name: T&A Cox	Equipment: JCB 3CX

Location Number	Location Type	Level	Logged By	Scale	Status
TP166	TP	97.33m AoD	HBW	1:10	FINAL

Backfill	Water Strikes	Sample and In Situ Testing Depth (m)	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
		0.10	D1					Soft dark brown slightly gravelly sandy CLAY with frequent rootlets. Gravel is angular to subangular fine to coarse limestone. Sand is fine and medium. (TOPSOIL).
		0.20	ES1					
		0.30 - 0.60	B1		0.27 0.30	97.06 97.03		Light brown slightly clayey sandy angular to subangular fine to coarse GRAVEL of limestone with a medium cobble and low boulder content. Sand is fine and medium. Cobbles and boulders are angular to subangular weak limestone.
		0.40	D2					Creamish brown sandy angular to subangular fine to coarse GRAVEL of limestone with a low cobble content. Sand is fine and medium. Cobbles are angular to subangular weak to moderately strong limestone.
		0.70	ES2					
		0.80	D3					
					0.95	96.38		End of Trial Pit at 0.95m

Dimensions		Trench Support and Comment			Water Stike General	
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Depth Strike	Date Time
1.80	0.60	Stable				

Remarks

1. Groundwater not encountered. 2. Terminated due to tough digging on bedrock. 3. No visual or olfactory evidence of contamination.

Trial Pit Log

EXPLORATION & TESTING ASSOCIATES

Project Name: Oxfordshire RFI	Client: BWB Consulting Ltd	Date: 13/09/2022
Location: Oxfordshire	Contractor: Exploration & Testing	Co-ords: E453924.14 N223694.81
Project No. : C10172	Crew Name: T&A Cox	Equipment: JCB 3CX

Location Number	Location Type	Level	Logged By	Scale	Status
TP167	TP	93.93m AoD	HBW	1:10	FINAL

Backfill	Water Strikes	Sample and In Situ Testing Depth (m)	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
		0.10	ES1					Soft dark brown slightly gravelly sandy CLAY with frequent rootlets. Gravel is angular to subangular fine to coarse limestone. Sand is fine and medium. (TOPSOIL).
		0.20	D1					
					0.30	93.63		Light brown slightly clayey sandy angular to subangular fine to coarse GRAVEL of limestone with a medium cobble and low boulder content. Sand is fine and medium. Cobbles and boulders are angular to subangular weak limestone.
		0.50	ES2					
		0.60	D2					
					0.64	93.29		Creamish brown sandy angular to subangular fine to coarse GRAVEL of limestone with a medium cobble. Sand is fine and medium. Cobbles are angular to subangular weak to moderately strong limestone.
		0.70 - 1.10	B1					
		0.80	D3					
					1.00	92.93		Weak to moderately strong light grey LIMESTONE. Recovered as light grey BOULDERS with many cobbles and some GRAVEL. Boulders and cobbles are up to 300mm of angular to subangular extremely weak to moderately strong limestone. Gravel is angular to subangular fine to coarse limestone.
					1.10	92.83		End of Trial Pit at 1.10m

1

2

Dimensions		Trench Support and Comment			Water Stike General	
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Depth Strike	Date Time
1.80	0.60	Stable				

Remarks

1. Groundwater not encountered. 2. Terminated due to tough digging on bedrock. 3. No visual or olfactory evidence of contamination.

Trial Pit Log

EXPLORATION & TESTING ASSOCIATES

Project Name: Oxfordshire RFI	Client: BWB Consulting Ltd	Date: 13/09/2022
Location: Oxfordshire	Contractor: Exploration & Testing	Co-ords: E454039.93 N223549.00
Project No. : C10172	Crew Name: T&A Cox	Equipment: JCB 3CX

Location Number	Location Type	Level	Logged By	Scale	Status
TP168	TP	89.02m AoD	HBW	1:10	FINAL

Backfill	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.00 - 0.20	B1					Soft dark brown slightly gravelly sandy CLAY. Gravel is angular to subangular fine to coarse limestone. (TOPSOIL).
		0.15	ES1					
		0.30	D1		0.27	88.75		Light brown clayey angular to subangular fine to coarse GRAVEL of limestone with a low cobble content. Cobbles are angular to subangular limestone.
		0.45	ES2		0.40	88.62		Creamish brown sandy angular to subangular fine to coarse GRAVEL of limestone with a medium cobble and low boulder content. Sand is fine and medium. Cobbles are angular to subangular weak to moderately strong limestone.
		0.60	D2					
		1.10 - 1.50	B2		1.10	87.92		Stiff grey mottled orange slightly gravelly sandy CLAY with a low cobble content. Gravel is angular to subangular fine to coarse limestone. Sand is fine and medium.
		1.30	D3					
					1.90	87.12		End of Trial Pit at 1.90m

1

2

Dimensions		Trench Support and Comment			Water Stike General	
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Depth Strike	Date Time
1.80	0.60	Stable				

Remarks

1. Groundwater not encountered. 2. Terminated due to stiff clay. 3. No visual or olfactory evidence of contamination.

Trial Pit Log

Project Name: Oxfordshire RFI	Client: BWB Consulting Ltd	Date: 13/09/2022
Location: Oxfordshire	Contractor: Exploration & Testing	Co-ords: E454105.91 N223556.10
Project No. : C10172	Crew Name: T&A Cox	Equipment: JCB 3CX

Location Number	Location Type	Level	Logged By	Scale	Status
TP169	TP	90.07m AoD	HBW	1:10	FINAL

Backfill	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.15	ES1					Soft dark brown slightly gravelly sandy CLAY with frequent rootlets. Gravel is angular to subangular fine to coarse limestone. Sand is fine and medium. (TOPSOIL).
		0.20	D1		0.23	89.84		
		0.30	D2					Light brown slightly clayey slightly sandy angular to subangular fine to coarse GRAVEL of limestone with a medium cobble and low boulder content. Sand is fine and medium. Cobbles and boulders are angular to subangular weak limestone.
		0.41	ES2		0.41	89.66		
		0.41 - 0.45	B1		0.45	89.62		Creamish brown sandy angular to subangular fine to coarse GRAVEL of limestone with a medium cobble and low boulder content. Sand is fine and medium. Cobbles and boulders are angular to subangular weak to moderately strong limestone.
		0.42	D3					End of Trial Pit at 0.45m

Dimensions		Trench Support and Comment			Water Stike General	
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Depth Strike	Date Time
1.80	0.60	Stable				

Remarks

1. Groundwater not encountered. 2. Terminated due to tough digging on bedrock. 3. No visual or olfactory evidence of contamination.

Trial Pit Log

EXPLORATION & TESTING ASSOCIATES

Project Name: Oxfordshire RFI	Client: BWB Consulting Ltd	Date: 15/09/2022
Location: Oxfordshire	Contractor: Exploration & Testing	Co-ords: E453651.44 N224497.60
Project No. : C10172	Crew Name: T&A Cox	Equipment: JCB 3CX

Location Number	Location Type	Level	Logged By	Scale	Status
TP170	TP	104.28m AoD	HBW	1:10	FINAL

Backfill	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.05	ES1					Soft dark brown slightly sandy gravelly CLAY with frequent rootlets. Sand is fine and medium. Gravel is angular to subangular fine to coarse limestone. (TOPSOIL).
		0.15	D1					
					0.25	104.03		Light brown slightly sandy clayey angular to subangular fine to coarse GRAVEL of limestone with a low cobble content. Cobbles are angular to subangular limestone.
		0.35	D2					
					0.55	103.73		Creamish brown slightly clayey slightly sandy angular to subangular fine to coarse GRAVEL of limestone with a high cobble and a low boulder content. Cobbles are boulders are angular to subangular limestone. *Between 0.55m and 0.72m bgl: Becoming clayey.*
		0.60	D3					
		0.70 - 1.00	B1					
					1.10	103.18		Weak to moderately strong light grey LIMESTONE. Recovered as light grey BOULDERS with many cobbles and some GRAVEL. Boulders and cobbles are up to 300mm of angular to subangular extremely weak to moderately strong limestone. Gravel is angular to subangular fine to coarse limestone.
					1.85	102.43		End of Trial Pit at 1.85m

1

2

Dimensions		Trench Support and Comment			Water Stike General	
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Depth Strike	Date Time
1.80	0.60	Stable				

Remarks

1. Groundwater not encountered. 2. Terminated due to tough digging on bedrock. 3. No visual or olfactory evidence of contamination.

Trial Pit Log

EXPLORATION & TESTING ASSOCIATES

Project Name: Oxfordshire RFI	Client: BWB Consulting Ltd	Date: 14/09/2022
Location: Oxfordshire	Contractor: Exploration & Testing	Co-ords: E454882.01 N228829.97
Project No. : C10172	Crew Name: T&A Cox	Equipment: JCB 3CX

Location Number	Location Type	Level	Logged By	Scale	Status
TP171	TP	116.70m AoD	HBW	1:10	FINAL

Backfill	Water Strikes	Sample and In Situ Testing Depth (m)	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
		0.10	D1					Soft dark brown slightly gravelly sandy CLAY with frequent rootlets. Gravel is angular to subangular fine to coarse limestone. Sand is fine and medium. (TOPSOIL).
		0.20	ES1					
		0.30	ES2		0.26	116.44		
		0.30 - 0.90	B1					Creamish brown sandy angular to subangular fine to coarse GRAVEL of limestone with a low cobble content. Sand is fine and medium. Cobbles are angular to subangular weak to moderately strong limestone.
		0.40	D2					
		0.80	D3					
					0.90	115.80		End of Trial Pit at 0.90m

1

2

Dimensions		Trench Support and Comment			Water Stike General	
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Depth Strike	Date Time
1.80	0.60	Stable				

Remarks

1. Groundwater not encountered. 2. Terminated due to tough digging on bedrock. 3. No visual or olfactory evidence of contamination.

Trial Pit Log

EXPLORATION & TESTING ASSOCIATES

Project Name: Oxfordshire RFI	Client: BWB Consulting Ltd	Date: 12/09/2022
Location: Oxfordshire	Contractor: Exploration & Testing	Co-ords: E454241.92 N226668.32
Project No. : C10172	Crew Name: T&A Cox	Equipment: JCB 3CX

Location Number	Location Type	Level	Logged By	Scale	Status
TP172	TP	117.88m AoD	HBW	1:10	FINAL

Backfill	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.05	D1					Soft brown slightly gravelly sandy CLAY. Gravel is angular to subangular fine to coarse limestone. Sand is fine and medium. (TOPSOIL).
		0.15	ES1					
					0.20	117.68		
		0.30	D2					Light brown slightly clayey sandy angular to subangular fine to coarse GRAVEL of limestone with a medium cobble and low boulder content. Sand is fine and medium. Cobbles and boulders are angular to subangular weak limestone.
		0.40	ES2					
					0.56	117.32		
		0.60 - 1.20	B1					Creamish brown slightly clayey sandy angular to subangular fine to coarse GRAVEL of limestone with a low cobble content. Sand is fine and medium. Cobbles are angular to subangular weak to moderately strong limestone.
		1.10	D3					
					1.20	116.68		End of Trial Pit at 1.20m

1

2

Dimensions		Trench Support and Comment			Water Stike General	
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Depth Strike	Date Time
1.80	0.60	Stable				

Remarks

1. Groundwater not encountered. 2. Terminated due to tough digging on bedrock. 3. No visual or olfactory evidence of contamination.

Trial Pit Log

EXPLORATION & TESTING ASSOCIATES

Project Name: Oxfordshire RFI	Client: BWB Consulting Ltd	Date: 12/09/2022
Location: Oxfordshire	Contractor: Exploration & Testing	Co-ords: E454520.41 N226851.79
Project No. : C10172	Crew Name: T&A Cox	Equipment: JCB 3CX

Location Number	Location Type	Level	Logged By	Scale	Status
TP173	TP	116.47m AoD	HBW	1:10	FINAL

Backfill	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.20	ES1					Soft brown slightly gravelly sandy CLAY. Gravel is angular to subangular fine to coarse limestone. Sand is fine and medium. (TOPSOIL).
		0.25	D1		0.30	116.17		
		0.40	D2					Light brown slightly clayey sandy angular to subangular fine to coarse GRAVEL of limestone with a low cobble content. Sand is fine and medium. Cobbles are angular to subangular weak limestone.
		0.50 - 1.00	B1		0.48	115.99		Creamish brown slightly clayey sandy angular to subangular fine to coarse GRAVEL of weak to moderately strong limestone. Sand is fine and medium.
		0.70	ES2					
		1.00	D3					
					1.10	115.37		End of Trial Pit at 1.10m

1

2

Dimensions		Trench Support and Comment			Water Stike General	
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Depth Strike	Date Time
1.80	0.60	Stable				

Remarks

1. Groundwater not encountered. 2. Terminated due to tough digging on bedrock. 3. No visual or olfactory evidence of contamination.

Trial Pit Log

EXPLORATION & TESTING ASSOCIATES

Project Name: Oxfordshire RFI	Client: BWB Consulting Ltd	Date: 12/09/2022
Location: Oxfordshire	Contractor: Exploration & Testing	Co-ords: E454520.41 N226851.79
Project No. : C10172	Crew Name: T&A Cox	Equipment: JCB 3CX

Location Number	Location Type	Level	Logged By	Scale	Status
TP174	TP	116.47m AoD	HBW	1:10	FINAL

Backfill	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.00 - 0.20	B1					Soft brown slightly gravelly sandy CLAY. Gravel is angular to subangular fine to coarse limestone. Sand is fine and medium. (TOPSOIL).
		0.10	D1					
		0.25	ES1		0.26	116.21		
		0.30	D2					Soft reddish brown slightly gravelly sandy CLAY. Gravel is angular to subangular fine to coarse limestone. Sand is fine and medium.
					0.41	116.06		Creamish brown sandy angular to subangular fine to coarse GRAVEL of limestone with a low cobble content. Sand is fine and medium. Cobbles are angular to subangular weak to moderately strong limestone.
		0.70	D3					
		1.00	ES2					
					1.20	115.27		End of Trial Pit at 1.20m

1

2

Dimensions		Trench Support and Comment			Water Stike General	
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Depth Strike	Date Time
1.80	0.60	Stable				

Remarks

1. Groundwater not encountered. 2. Terminated due to tough digging on bedrock. 3. No visual or olfactory evidence of contamination.

Trial Pit Log

EXPLORATION & TESTING ASSOCIATES

Project Name: Oxfordshire RFI	Client: BWB Consulting Ltd	Date: 12/09/2022
Location: Oxfordshire	Contractor: Exploration & Testing	Co-ords: E454633.23 N227070.00
Project No. : C10172	Crew Name: T&A Cox	Equipment: JCB 3CX

Location Number	Location Type	Level	Logged By	Scale	Status
TP175	TP	118.00m AoD	HBW	1:10	FINAL

Backfill	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.15	D1					Soft brown slightly gravelly sandy CLAY. Gravel is angular to subangular fine to coarse limestone. Sand is fine and medium. (TOPSOIL).
		0.20	ES1					
					0.30	117.70		Light brown slightly clayey sandy angular to subangular fine to coarse GRAVEL of limestone with a low cobble and medium boulder content. Sand is fine and medium. Cobbles and boulders are angular to subangular weak limestone.
		0.45	D2					
		0.50	ES2					
					0.56	117.44		Creamish brown sandy angular to subangular fine to coarse GRAVEL of limestone with a medium cobble content. Sand is fine and medium. Cobbles are angular to subangular weak to moderately strong limestone.
		0.60 - 1.00	B1					
		1.00	D3		1.00	117.00		Weak to moderately strong light grey LIMESTONE. Recovered as light grey BOULDERS with many cobbles and some GRAVEL. Boulders and cobbles are up to 300mm of angular to subangular weak limestone. Gravel is angular to subangular fine to coarse limestone.
					1.20	116.80		End of Trial Pit at 1.20m

1

2

Dimensions		Trench Support and Comment			Water Stike General	
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Depth Strike	Date Time
1.80	0.60	Stable				

Remarks

1. Groundwater not encountered. 2. Terminated due to tough digging on bedrock. 3. No visual or olfactory evidence of contamination.

Trial Pit Log

EXPLORATION & TESTING ASSOCIATES

Project Name: Oxfordshire RFI	Client: BWB Consulting Ltd	Date: 12/09/2022
Location: Oxfordshire	Contractor: Exploration & Testing	Co-ords: E454641.87 N227195.83
Project No. : C10172	Crew Name: T&A Cox	Equipment: JCB 3CX

Location Number	Location Type	Level	Logged By	Scale	Status
TP176	TP	119.74m AoD	HBW	1:10	FINAL

Backfill	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.15	ES1					Soft dark brown slightly gravelly sandy CLAY with frequent rootlets. Gravel is angular to subangular fine to coarse limestone. Sand is fine and medium. (TOPSOIL).
		0.25	D1					
		0.30 - 0.50	B1		0.30	119.44		
		0.40	D2					Light brown slightly clayey slightly sandy angular to subangular fine to coarse GRAVEL of limestone with a medium cobble and low boulder content. Sand is fine and medium. Cobbles and boulders are angular to subangular weak limestone.
					0.50	119.24		Creamish brown sandy angular to subangular fine to coarse GRAVEL of limestone with a low cobble content. Sand is fine and medium. Cobbles are angular to subangular weak to moderately strong limestone.
		0.80	ES2					
		1.25	D3					
					1.40	118.34		End of Trial Pit at 1.40m

1

2

Dimensions		Trench Support and Comment			Water Stike General	
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Depth Strike	Date Time
1.80	0.60	Stable				

Remarks

1. Groundwater not encountered. 2. Terminated due to tough digging on bedrock. 3. No visual or olfactory evidence of contamination.

Trial Pit Log

EXPLORATION & TESTING ASSOCIATES

Project Name: Oxfordshire RFI	Client: BWB Consulting Ltd	Date: 16/09/2022
Location: Oxfordshire	Contractor: Exploration & Testing	Co-ords: E454701.13 N227366.91
Project No. : C10172	Crew Name: T&A Cox	Equipment: JCB 3CX

Location Number	Location Type	Level	Logged By	Scale	Status
TP177	TP	121.05m AoD	HBW	1:10	FINAL

Backfill	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.00 - 0.20	B1					Soft dark brown slightly sandy gravelly CLAY. Sand is fine to medium. Gravel is angular to subangular fine to coarse limestone (TOPSOIL).
		0.10	ES1					
					0.20	120.85		Light brown slightly sandy angular to subangular fine to coarse GRAVEL of limestone. Sand is fine and medium.
		0.30	D1					
					0.40	120.65		Reddish brown angular to subangular fine to coarse GRAVEL of limestone with a low boulder and medium cobble content. Boulders and cobbles are angular to subangular limestone.
		0.50	ES2					
					0.70	120.35		Light brown angular to subangular fine to coarse GRAVEL of limestone with a low boulder and medium cobble content. Boulders and cobbles are angular to subangular weak limestone.
		0.80	D2					
					1.40	119.65		Stiff orange mottled grey slightly gravelly sandy CLAY. Sand is fine to medium. Gravel is angular to subangular fine to medium limestone.
		1.60	D3					
					1.70	119.35		End of Trial Pit at 1.70m

1

2

Dimensions		Trench Support and Comment			Water Stike General	
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Depth Strike	Date Time
1.80	0.60	Stable				

Remarks

1. Groundwater not encountered. 2. Terminated due to stiff clay. 3. No visual or olfactory evidence of contamination.

Trial Pit Log

EXPLORATION & TESTING ASSOCIATES

Project Name: Oxfordshire RFI	Client: BWB Consulting Ltd	Date: 16/09/2022
Location: Oxfordshire	Contractor: Exploration & Testing	Co-ords: E454703.90 N227661.04
Project No. : C10172	Crew Name: T&A Cox	Equipment: JCB 3CX

Location Number	Location Type	Level	Logged By	Scale	Status
TP178	TP	123.44m AoD	HBW	1:10	FINAL

Backfill	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.15	ES1					Soft dark brown slightly sandy gravelly CLAY. Sand is fine to medium. Gravel is angular to subangular fine to coarse limestone (TOPSOIL).
		0.25	D1		0.27	123.17		
		0.35	D2					Light brown slightly sandy angular to subangular fine to coarse GRAVEL of limestone. Sand is fine and medium.
					0.40	123.04		
		0.45	D3					Creamish brown slightly sandy clayey angular fine to coarse GRAVEL of limestone with a low boulder and medium cobble content. Boulders and cobbles are angular moderately strong limestone.
		0.50	B1					
					1.15	122.29		End of Trial Pit at 1.15m

1

2

Dimensions		Trench Support and Comment			Water Stike General	
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Depth Strike	Date Time
1.80	0.60	Stable				

Remarks

1. Groundwater not encountered. 2. Terminated due to tough digging on bedrock. 3. No visual or olfactory evidence of contamination.

Trial Pit Log

EXPLORATION & TESTING ASSOCIATES

Project Name: Oxfordshire RFI	Client: BWB Consulting Ltd	Date: 16/09/2022
Location: Oxfordshire	Contractor: Exploration & Testing	Co-ords: E454622.00 N227765.12
Project No. : C10172	Crew Name: T&A Cox	Equipment: JCB 3CX

Location Number	Location Type	Level	Logged By	Scale	Status
TP179	TP	123.35m AoD	HBW	1:10	FINAL

Backfill	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.05	ES1					Soft dark brown slightly sandy gravelly CLAY. Sand is fine to medium. Gravel is angular to subangular fine to coarse limestone (TOPSOIL).
		0.20	D1		0.23	123.12		
		0.40	D2					Light brown slightly sandy angular to subangular fine to coarse GRAVEL of limestone with a low boulder and medium cobble content. Sand is fine and medium. Boulders and cobbles are angular to subangular weak limestone.
		0.60	B1		0.52	122.83		
		0.70	D3					Creamish brown slightly sandy clayey angular fine to coarse GRAVEL of limestone with a low cobble. Cobbles are angular moderately strong limestone.
					1.00	122.35		End of Trial Pit at 1.00m

1

2

Dimensions		Trench Support and Comment			Water Stike General	
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Depth Strike	Date Time
1.80	0.60	Stable				

Remarks

1. Groundwater not encountered. 2. Terminated due to tough digging on bedrock. 3. No visual or olfactory evidence of contamination.

Trial Pit Log

EXPLORATION & TESTING ASSOCIATES

Project Name: Oxfordshire RFI	Client: BWB Consulting Ltd	Date: 14/09/2022
Location: Oxfordshire	Contractor: Exploration & Testing	Co-ords: E454514.96 N228201.26
Project No. : C10172	Crew Name: T&A Cox	Equipment: JCB 3CX

Location Number	Location Type	Level	Logged By	Scale	Status
TP180	TP	111.21m AoD	HBW	1:10	FINAL

Backfill	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.10	ES1					Soft dark brown slightly gravelly sandy CLAY with frequent rootlets. Gravel is angular to subangular fine to coarse limestone. Sand is fine and medium. (TOPSOIL).
		0.20	D1					
					0.30	110.91		
		0.40	D2					Light brown slightly clayey sandy angular to subangular fine to coarse GRAVEL of limestone with a medium cobble and low boulder content. Sand is fine and medium. Cobbles and boulders are angular to subangular weak limestone.
		0.50 - 1.00	B1					
		0.60	ES2					
		0.80	D3					
					1.00	110.21		End of Trial Pit at 1.00m

1

2

Dimensions		Trench Support and Comment			Water Stike General	
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Depth Strike	Date Time
1.80	0.60	Stable				

Remarks

1. Groundwater not encountered. 2. Terminated due to tough digging on bedrock. 3. No visual or olfactory evidence of contamination.

Trial Pit Log

EXPLORATION & TESTING ASSOCIATES

Project Name: Oxfordshire RFI	Client: BWB Consulting Ltd	Date: 13/09/2022
Location: Oxfordshire	Contractor: Exploration & Testing	Co-ords: E453168.88 N227281.05
Project No. : C10172	Crew Name: T&A Cox	Equipment: JCB 3CX

Location Number	Location Type	Level	Logged By	Scale	Status
TP181	TP	124.16m AoD	HBW	1:10	FINAL

Backfill	Water Strikes	Sample and In Situ Testing Depth (m)	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
		0.10	ES1					Soft dark brown slightly gravelly sandy CLAY with frequent rootlets. Gravel is angular to subangular fine to coarse limestone. Sand is fine and medium. (TOPSOIL).
		0.20	D1		0.23	123.93		
		0.30	D2					Light brown slightly clayey sandy angular to subangular fine to coarse GRAVEL of limestone with a medium cobble and low boulder content. Sand is fine and medium. Cobbles and boulders are angular to subangular weak limestone.
		0.50	ES2		0.43	123.73		Creamish brown sandy angular to subangular fine to coarse GRAVEL of limestone with a low cobble content. Sand is fine and medium. Cobbles are angular to subangular weak to moderately strong limestone.
		0.50 - 1.00	B1					
		1.00	D3					
					1.26	122.90		End of Trial Pit at 1.26m

1

2

Dimensions		Trench Support and Comment			Water Stike General	
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Depth Strike	Date Time
1.80	0.60	Stable				

Remarks

1. Groundwater not encountered. 2. Terminated due to tough digging on bedrock. 3. No visual or olfactory evidence of contamination.

Trial Pit Log

EXPLORATION & TESTING ASSOCIATES

Project Name: Oxfordshire RFI	Client: BWB Consulting Ltd	Date: 13/09/2022
Location: Oxfordshire	Contractor: Exploration & Testing	Co-ords: E452916.12 N227608.04
Project No. : C10172	Crew Name: T&A Cox	Equipment: JCB 3CX

Location Number	Location Type	Level	Logged By	Scale	Status
TP182	TP	119.63m AoD	HBW	1:10	FINAL

Backfill	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.05	ES1					Soft dark brown slightly gravelly sandy CLAY with frequent rootlets. Gravel is angular to subangular fine to coarse limestone. Sand is fine and medium. (TOPSOIL).
		0.15	D1					
					0.26	119.37		
		0.30 - 0.40	B1					Light brown slightly clayey sandy angular to subangular fine to coarse GRAVEL of limestone with a medium cobble and low boulder content. Sand is fine and medium. Cobbles and boulders are angular to subangular weak limestone.
					0.40	119.23		
		0.50	D2					Creamish brown sandy angular to subangular fine to coarse GRAVEL of limestone with a low cobble content. Sand is fine and medium. Cobbles are angular to subangular weak to moderately strong limestone.
		0.60	ES2					
		1.20	D3					
					1.30	118.33		End of Trial Pit at 1.30m

1

2

Dimensions		Trench Support and Comment			Water Stike General	
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Depth Strike	Date Time
1.80	0.60	Stable				

Remarks

1. Groundwater not encountered. 2. Terminated due to tough digging on bedrock. 3, No visual or olfactory evidence of contamination.

Trial Pit Log

EXPLORATION & TESTING ASSOCIATES

Project Name: Oxfordshire RFI	Client: BWB Consulting Ltd	Date: 14/09/2022
Location: Oxfordshire	Contractor: Exploration & Testing	Co-ords: E454522.66 N228000.24
Project No. : C10172	Crew Name: T&A Cox	Equipment: JCB 3CX

Location Number	Location Type	Level	Logged By	Scale	Status
TP183	TP	115.10m AoD	HBW	1:10	FINAL

Backfill	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.05	ES1					Soft brown slightly gravelly sandy CLAY with frequent rootlets. Gravel is angular to subangular fine to coarse limestone. Sand is fine and medium. (TOPSOIL).
		0.15	D1					
					0.30	114.80		Light brown slightly clayey sandy angular to subangular fine to coarse GRAVEL of limestone with a high cobble and low boulder content. Sand is fine and medium. Cobbles and boulders are angular to subangular weak limestone.
		0.45	ES2					*Between 0.50 and 0.60m bgl: Plastic land drain.*
					0.64	114.46		Creamish brown sandy angular to subangular fine to coarse GRAVEL of limestone with a medium cobble and low boulder content. Sand is fine and medium. Cobbles and boulders are angular to subangular weak to moderately strong limestone.
		0.70	D2					
		0.70 - 0.90	B1					
		0.80	D3					
					0.95	114.16		End of Trial Pit at 0.95m

1

2

Dimensions		Trench Support and Comment			Water Stike General	
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Depth Strike	Date Time
1.80	0.60	Stable				

Remarks

1. Groundwater not encountered. 2. Terminated due to tough digging on bedrock. 3. No visual or olfactory evidence of contamination.

Trial Pit Log

EXPLORATION & TESTING ASSOCIATES

Project Name: Oxfordshire RFI	Client: BWB Consulting Ltd	Date: 14/09/2022
Location: Oxfordshire	Contractor: Exploration & Testing	Co-ords: E454476.42 N228333.77
Project No. : C10172	Crew Name: T&A Cox	Equipment: JCB 3CX

Location Number	Location Type	Level	Logged By	Scale	Status
TP184	TP	113.12m AoD	HBW	1:10	FINAL

Backfill	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.00 - 0.20	B1					Soft dark brown slightly gravelly sandy CLAY with frequent rootlets. Gravel is angular to subangular fine to coarse limestone. Sand is fine and medium. (TOPSOIL).
		0.15	ES1					
		0.25	D1					
		0.30	ES2		0.28	112.84		Light brown slightly clayey sandy angular to subangular fine to coarse GRAVEL of limestone with a medium cobble and low boulder content. Sand is fine and medium. Cobbles and boulders are angular to subangular weak limestone.
		0.40	D2					
					0.56	112.56		Creamish brown sandy angular to subangular fine to coarse GRAVEL of limestone with a medium cobble and low boulder content. Sand is fine and medium. Cobbles and boulders are angular to subangular weak to moderately strong limestone.
		0.80	D3					
					1.30	111.82		End of Trial Pit at 1.30m

1

2

Dimensions		Trench Support and Comment			Water Stike General	
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Depth Strike	Date Time
1.80	0.60	Stable				

Remarks

1. Groundwater not encountered. 2. Terminated due to tough digging on bedrock. 3. No visual or olfactory evidence of contamination.

EXPLORATION & TESTING ASSOCIATES

Trial Pit Log

Project Name: Oxfordshire RFI	Client: BWB Consulting Ltd	Date: 14/09/2022
Location: Oxfordshire	Contractor: Exploration & Testing	Co-ords: E455019.99 N229001.75
Project No. : C10172	Crew Name: T&A Cox	Equipment: JCB 3CX

Location Number	Location Type	Level	Logged By	Scale	Status
TP185	TP	115.81m AoD	HBW	1:10	FINAL

Backfill	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.10	ES1					Soft dark brown slightly gravelly sandy CLAY with frequent rootlets. Gravel is angular to subangular fine to coarse limestone. Sand is fine and medium. (TOPSOIL).
		0.20	D1		0.20	115.61		Stiff orange mottled grey slightly gravelly sandy CLAY with a low cobble content. Sand is fine and medium. Gravel is angular to subangular fine to coarse limestone.
		0.30	ES2					
		0.50	B1					
		0.50	D2					
					1.00	114.81		Creamish brown slightly sandy clayey angular to subangular fine to coarse GRAVEL of limestone with a low cobble content. Sand is fine and medium. Cobbles are angular to subangular weak to moderately strong limestone.
		1.20	D3					
					1.35	114.46		End of Trial Pit at 1.35m

1

2

Dimensions		Trench Support and Comment			Water Stike General	
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Depth Strike	Date Time
1.80	0.60	Stable				

Remarks

1. Groundwater not encountered. 2. Terminated due to tough digging on bedrock. 3. No visual or olfactory evidence of contamination.

Trial Pit Log

EXPLORATION & TESTING ASSOCIATES

Project Name: Oxfordshire RFI	Client: BWB Consulting Ltd	Date: 14/09/2022
Location: Oxfordshire	Contractor: Exploration & Testing	Co-ords: E454639.93 N228533.66
Project No. : C10172	Crew Name: T&A Cox	Equipment: JCB 3CX

Location Number	Location Type	Level	Logged By	Scale	Status
TP186	TP	112.49m AoD	HBW	1:10	FINAL

Backfill	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.10	ES1					Soft dark brown slightly gravelly sandy CLAY with frequent rootlets. Gravel is angular to subangular fine to coarse limestone. Sand is fine and medium. (TOPSOIL).
		0.20	D1		0.22	112.27		Light brown slightly clayey sandy angular to subangular fine to coarse GRAVEL of limestone with a medium cobble and low boulder content. Sand is fine and medium. Cobbles and boulders are angular to subangular weak limestone.
		0.40	B1		0.33	112.16		Creamish brown sandy angular to subangular fine to coarse GRAVEL of limestone with a low cobble content. Sand is fine and medium. Cobbles are angular to subangular weak to moderately strong limestone.
		0.40	ES2					
		0.50	D2					
					0.75	111.74		End of Trial Pit at 0.75m

Dimensions		Trench Support and Comment			Water Stike General	
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Depth Strike	Date Time
1.80	0.60	Stable				

Remarks

1. Groundwater not encountered. 2. Terminated due to tough digging on bedrock. 3. No visual or olfactory evidence of contamination.

Trial Pit Log

EXPLORATION & TESTING ASSOCIATES

Project Name: Oxfordshire RFI	Client: BWB Consulting Ltd	Date: 14/09/2022
Location: Oxfordshire	Contractor: Exploration & Testing	Co-ords: E454734.17 N228685.82
Project No. : C10172	Crew Name: T&A Cox	Equipment: JCB 3CX

Location Number	Location Type	Level	Logged By	Scale	Status
TP187	TP	115.72m AoD	HBW	1:10	FINAL

Backfill	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.15	ES1					Soft dark brown slightly gravelly sandy CLAY with frequent rootlets. Gravel is angular to subangular fine to coarse limestone. Sand is fine and medium. (TOPSOIL).
					0.31	115.41		
		0.40	D1					Light brown slightly clayey sandy angular to subangular fine to coarse GRAVEL of limestone with a medium cobble and low boulder content. Sand is fine and medium. Cobbles and boulders are angular to subangular weak limestone.
					0.57	115.15		
		0.60	B1					Creamish brown sandy angular to subangular fine to coarse GRAVEL of limestone with a low cobble content. Sand is fine and medium. Cobbles are angular to subangular weak to moderately strong limestone.
		0.70	D2					
		0.80	ES2					
		1.00	D3					
					1.10	114.62		End of Trial Pit at 1.10m

1

2

Dimensions		Trench Support and Comment			Water Stike General	
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Depth Strike	Date Time
1.80	0.60	Stable				

Remarks

1. Groundwater not encountered. 2. Terminated due to tough digging on bedrock. 3. No visual or olfactory evidence of contamination.

Trial Pit Log

EXPLORATION & TESTING ASSOCIATES

Project Name: Oxfordshire RFI	Client: BWB Consulting Ltd	Date: 12/09/2022
Location: Oxfordshire	Contractor: Exploration & Testing	Co-ords: E454733.01 N227249.97
Project No. : C10172	Crew Name: T&A Cox	Equipment: JCB 3CX

Location Number	Location Type	Level	Logged By	Scale	Status
TP188A	TP	119.83m AoD	HBW	1:10	FINAL

Backfill	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.10	ES1					Soft dark brown slightly gravelly sandy CLAY with frequent rootlets. Gravel is angular to subangular fine to coarse limestone. Sand is fine and medium. (TOPSOIL).
		0.20	D1		0.21	119.62		
		0.30	D2					Light brown slightly clayey sandy GRAVEL with a medium cobble and low boulder content. Sand is fine and medium. Gravel is angular to subangular fine to coarse limestone. Cobbles and boulders are angular to subangular weak limestone.
		0.50	ES2		0.48	119.35		
		0.50 - 1.00	B1					Creamish brown sandy angular to subangular fine to coarse GRAVEL of limestone with a low cobble content. Sand is fine and medium. Cobbles are angular to subangular weak to moderately strong limestone.
		1.00	D3					
					1.32	118.51		End of Trial Pit at 1.32m

1

2

Dimensions		Trench Support and Comment			Water Stike General	
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Depth Strike	Date Time
1.80	0.60	Stable				

Remarks

1. Groundwater not encountered. 2. Terminated due to tough digging on bedrock. 3. No visual or olfactory evidence of contamination.

Trial Pit Log

EXPLORATION & TESTING ASSOCIATES

Project Name: Oxfordshire RFI	Client: BWB Consulting Ltd	Date: 16/09/2022
Location: Oxfordshire	Contractor: Exploration & Testing	Co-ords: E454754.16 N227472.15
Project No. : C10172	Crew Name: T&A Cox	Equipment: JCB 3CX

Location Number	Location Type	Level	Logged By	Scale	Status
TP189	TP	121.89m AoD	HBW	1:10	FINAL

Backfill	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.20	ES1					Soft dark brown slightly sandy gravelly CLAY. Sand is fine to medium. Gravel is angular to subangular fine to coarse limestone (TOPSOIL).
		0.30	D1		0.26	121.63		Light brown slightly sandy angular to subangular fine to coarse GRAVEL of limestone with a low boulder and medium cobble content. Sand is fine and medium. Boulders and cobbles are angular to subangular weak limestone.
		0.50	ES2		0.45	121.44		Stiff reddish brown slightly gravelly sandy CLAY. Sand is fine to medium. Gravel is angular to subangular fine to medium limestone.
		0.70	D2					
		0.90	B		0.88	121.01		Weak to moderately strong light grey LIMESTONE. Recovered as light grey BOULDERS with many cobbles and some GRAVEL. Boulders and cobbles are up to 300mm of angular to subangular extremely weak to moderately strong limestone. Gravel is angular to subangular fine to coarse limestone.
		1.00	D3					
					1.40	120.49		End of Trial Pit at 1.40m

1

2

Dimensions		Trench Support and Comment			Water Stike General	
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Depth Strike	Date Time
1.80	0.60	Stable				

Remarks

1. Groundwater not encountered. 2. Terminated due to tough digging on bedrock. 3. No visual or olfactory evidence of contamination.





Contract:	Oxfordshire
Contract No.:	C10172
Client:	BWB Consulting Ltd

Title:	TP161
Drawing:	C10172-TP_1
Date:	15/09/2022

EXPLORATION
& TESTING ASSOCIATES





Contract:	Oxfordshire
Contract No.:	C10172
Client:	BWB Consulting Ltd

Title:	TP162
Drawing:	C10172-TP_1
Date:	15/09/2022

EXPLORATION
& TESTING ASSOCIATES





Contract:	Oxfordshire
Contract No.:	C10172
Client:	BWB Consulting Ltd
Title:	TP164
Drawing:	C10172-TP_1
Date:	15/09/2022

EXPLORATION
& TESTING ASSOCIATES





Contract:	Oxfordshire
Contract No.:	C10172
Client:	BWB Consulting Ltd

Title:	TP165
Drawing:	C10172-TP_1
Date:	15/09/2022

EXPLORATION
& TESTING ASSOCIATES





Contract:	Oxfordshire
Contract No.:	C10172
Client:	BWB Consulting Ltd

Title:	TP166
Drawing:	C10172-TP_1
Date:	13/09/2022

EXPLORATION
& TESTING ASSOCIATES





Contract:	Oxfordshire
Contract No.:	C10172
Client:	BWB Consulting Ltd

Title:	TP167
Drawing:	C10172-TP_1
Date:	13/09/2022

EXPLORATION
& TESTING ASSOCIATES





Contract:	Oxfordshire
Contract No.:	C10172
Client:	BWB Consulting Ltd

Title:	Tp168
Drawing:	C10172-TP_1
Date:	13/09/2022

EXPLORATION
& TESTING ASSOCIATES





Contract:	Oxfordshire
Contract No.:	C10172
Client:	BWB Consulting Ltd

Title:	TP169
Drawing:	C10172-TP_1
Date:	13/09/2022

EXPLORATION & TESTING ASSOCIATES





Contract:	Oxfordshire
Contract No.:	C10172
Client:	BWB Consulting Ltd

Title:	TP170
Drawing:	C10172-TP_1
Date:	15/09/2022

EXPLORATION
& TESTING ASSOCIATES





Contract:	Oxfordshire
Contract No.:	C10172
Client:	BWB Consulting Ltd

Title:	TP171
Drawing:	C10172-TP_1
Date:	14/09/2022

EXPLORATION
& TESTING ASSOCIATES





Contract:	Oxfordshire
Contract No.:	C10172
Client:	BWB Consulting Ltd

Title:	TP172
Drawing:	C10172-TP_1
Date:	12/09/2022

EXPLORATION
& TESTING ASSOCIATES





Contract:	Oxfordshire
Contract No.:	C10172
Client:	BWB Consulting Ltd

Title:	TP173
Drawing:	C10172-TP_1
Date:	12/09/2022

EXPLORATION
& TESTING ASSOCIATES





Contract:	Oxfordshire
Contract No.:	C10172
Client:	BWB Consulting Ltd

Title:	TP174
Drawing:	C10172-TP_1
Date:	12/09/2022

EXPLORATION & TESTING ASSOCIATES





Contract:	Oxfordshire
Contract No.:	C10172
Client:	BWB Consulting Ltd

Title:	TP175
Drawing:	C10172-TP_1
Date:	12/09/2022

EXPLORATION
& TESTING ASSOCIATES





Contract:	Oxfordshire
Contract No.:	C10172
Client:	BWB Consulting Ltd

Title:	TP176
Drawing:	C10172-Photos_P01
Date:	12/09/2022

EXPLORATION
& TESTING ASSOCIATES





Contract:	Oxfordshire
Contract No.:	C10172
Client:	BWB Consulting Ltd
Title:	TP177
Drawing:	C10172-Photos_P01
Date:	16/09/2022

EXPLORATION
& TESTING ASSOCIATES





Contract:	Oxfordshire
Contract No.:	C10172
Client:	BWB Consulting Ltd

Title:	TP178
Drawing:	C10172-Photos_P01
Date:	16/09/2022

EXPLORATION
& TESTING ASSOCIATES





Contract:	Oxfordshire
Contract No.:	C10172
Client:	BWB Consulting Ltd

Title:	TP179
Drawing:	C10172-Photos_P01
Date:	16/09/2022

EXPLORATION
& TESTING ASSOCIATES





Contract:	Oxfordshire
Contract No.:	C10172
Client:	BWB Consulting Ltd
Title:	TP180
Drawing:	C10172-TP_1
Date:	14/09/2022

EXPLORATION
& TESTING ASSOCIATES





Contract:	Oxfordshire
Contract No.:	C10172
Client:	BWB Consulting Ltd

Title:	TP181
Drawing:	C10172-TP_1
Date:	13/09/2022

EXPLORATION
& TESTING ASSOCIATES





Contract:	Oxfordshire
Contract No.:	C10172
Client:	BWB Consulting Ltd

Title:	TP182
Drawing:	C10172-TP_1
Date:	13/09/2022

EXPLORATION
& TESTING ASSOCIATES





Contract:	Oxfordshire
Contract No.:	C10172
Client:	BWB Consulting Ltd

Title:	TP183
Drawing:	C10172-TP_1
Date:	14/09/2022

EXPLORATION
& TESTING ASSOCIATES





Contract:	Oxfordshire
Contract No.:	C10172
Client:	BWB Consulting Ltd

Title:	TP184
Drawing:	C10172-TP_1
Date:	14/09/2022

EXPLORATION
& TESTING ASSOCIATES





Contract:	Oxfordshire
Contract No.:	C10172
Client:	BWB Consulting Ltd

Title:	TP185
Drawing:	C10172.TP_1
Date:	14/09/2022

EXPLORATION
& TESTING ASSOCIATES





Contract:	Oxfordshire
Contract No.:	C10172
Client:	BWB Consulting Ltd

Title:	TP186
Drawing:	C10172-TP_1
Date:	14/09/2022

EXPLORATION
& TESTING ASSOCIATES





Contract:	Oxfordshire
Contract No.:	C10172
Client:	BWB Consulting Ltd

Title:	TP187
Drawing:	C10172-TP_1
Date:	14/09/2022

EXPLORATION
& TESTING ASSOCIATES





Contract:	Oxfordshire
Contract No.:	C10172
Client:	BWB Consulting Ltd
Title:	TP188
Drawing:	C10172-TP_1
Date:	12/09/2022

EXPLORATION
& TESTING ASSOCIATES





Contract:	Oxfordshire
Contract No.:	C10172
Client:	BWB Consulting Ltd

Title:	TP189
Drawing:	C10172-TP_1
Date:	16/09/2022

EXPLORATION
& TESTING ASSOCIATES

EXPLORATION
& TESTING ASSOCIATES

APPENDIX 3: GEOTECHNICAL LABORATORY TESTING

EXPLORATION
& TESTING ASSOCIATES

Unit 8B Bowburn South Industrial Estate
Durham, DH6 5AD T: 0191 389 6543

UKAS TESTING

Laboratory Test Report

Client	Exploration and Testing Associates Limited
Address	number three Siskin Drive Middlemarch Business Park Coventry CV3 4FJ
F.A.O	[redacted]
Project:	Oxfordshire
Project Number:	C10172-2
Report Number:	L22-974-1
Date Received:	29 September 2022

Testing Required:	Water Content - BS EN 17892-1:2014 Determination of Liquid and Plastic Limits and Plasticity Index - BS EN 17892-12:2018 (Fall Cone Method) Particle Size Distribution - BS EN 17892-4:2016 Particle Density by Gas Jar - BS:1377-2:1990 Clause 8.2 Determination of Maximum Dry Density / Optimum Moisture Content by 2.5kg Rammer - BS:1377-4:1990 Determination of Maximum Dry Density / Optimum Moisture Content by 4.5kg Rammer - BS:1377-4:1990
Date Started:	4th October 2022
Date Finished:	14th October 2022

Re-issue Date:	25th October 2022
Reviewed By:	[redacted]
	[redacted] - Materials Director
Authorised By:	[redacted]
	[redacted] - Laboratory Manager
Remarks:	(*) denotes testing is outside of UKAS Scope of Accreditation.
	(+) denotes subcontracted testing.

Samples will be stored for one month after the report has been issue before being disposed of.

The published results appertain only to the specimens tested.

Exploration and Testing Associates Limited, registered in England and Wales #11803869 at 8B, Bowburn South Industrial Estate, Bowburn, Durham, DH6 5AD

EXPLORATION & TESTING ASSOCIATES

Determination of Water Content, Liquid Limit, Plastic Limit and Derivation of Plasticity Index

Project No.	Project Name
C10172_2	Oxfordshire

Hole No.	Sample			Soil Description	Water Content %	Passing 425µm %	Liquid Limit %	Plastic Limit %	Plasticity Index %	Remarks
	Type	Ref	Depth							
TP165	2	D	0.40	Brown, Sandy, Slightly Gravelly CLAY	22	98	55	23	32	Sample tested in natural state - material passing 425um estimated by hand picking
TP176	2	D	0.40	Brown, Sandy, Gravelly CLAY	12					
TP184	2	D	0.40	Brown, Sandy, Gravelly CLAY	15					
TP185	1	B	0.50	Grey/Orange Sandy Gravelly CLAY with Occasional Cobbles (Large)	18					
TP175	1	B	0.60	Yellow / Brown, Very Sandy GRAVEL with Cobbles (Silty)	9.2					
TP183	1	B	0.70	Grey COBBLES with Occasional, Sandy Clay Pockets	3.0					
TP189	2	D	0.70	Brown, Sandy, Slightly Gravelly CLAY	10	99	41	13	28	Sample tested in natural state - material passing 425um estimated by hand picking
TP167	3	D	0.80	Brown, Sandy, Gravelly CLAY	16					
TP161	3	D	0.80	Grey, Slightly Sandy, Slightly Gravelly CLAY	26	96	61	22	39	Sample tested in natural state - material passing 425um estimated by hand picking
TP180	3	D	0.80	Yellow / Brown, Very Sandy GRAVEL	5.3					
TP168	3	D	1.30	Grey GRAVEL with Occasional Sandy CLAY	3.8					Non Plastic
TP177	3	D	1.60	Grey/Brown, Slightly Sandy CLAY	17	96	39	15	24	Sample tested in natural state - material passing 425um estimated by hand picking

Water Content carried out in accordance with BS EN ISO 17892: Part 1: 2014: Clause 5.1 & 5.2

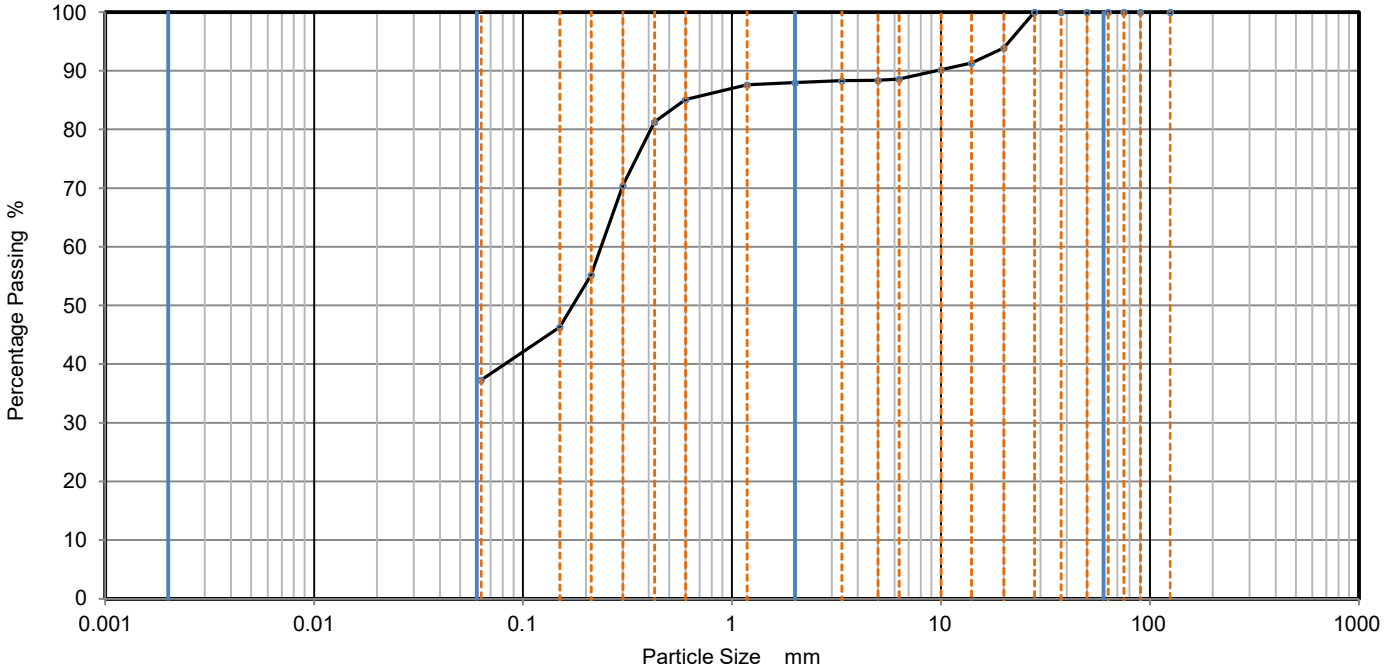
Liquid Limit, Plastic Limit & Plasticity Index all performed in accordance with BS EN ISO 17892: Part 12: 2018 - Fall cone four point method - Cone 80g/30°

Date	Approved By	
17/10/2022 10:25	N O'Brien	UKAS Accredited Laboratory No. 20632

EXPLORATION & TESTING ASSOCIATES

PARTICLE SIZE DISTRIBUTION

				Job Ref	**C10172_2**
				Borehole/Pit No.	TP179
Site Name	Oxfordshire			Sample No.	D
Soil Description	Brown, Sandy, Gravelly CLAY with Occasional Rootlet			Depth, m	0.20
Specimen Reference		Specimen Depth	m	Sample Type	1
Test Method	BS EN ISO 17892-4:2016 - Wet & Dry Sieving			KeyLAB ID	EAT_2022101237



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	94		
14	91		
10	90		
6.3	89		
5	88		
3.35	88		
2	88		
1.18	88		
0.6	85		
0.425	81		
0.3	70		
0.212	55		
0.15	46		
0.063	37		

Method of Pre-Treatment	None

Sample Proportions	% dry mass
Very coarse	0
Gravel	12
Sand	51
Fines <0.063mm	37

Grading Analysis		
D_{100}	mm	
D_{60}	mm	0.236
D_{30}	mm	
D_{10}	mm	
Uniformity Coefficient		
Curvature Coefficient		

Remarks

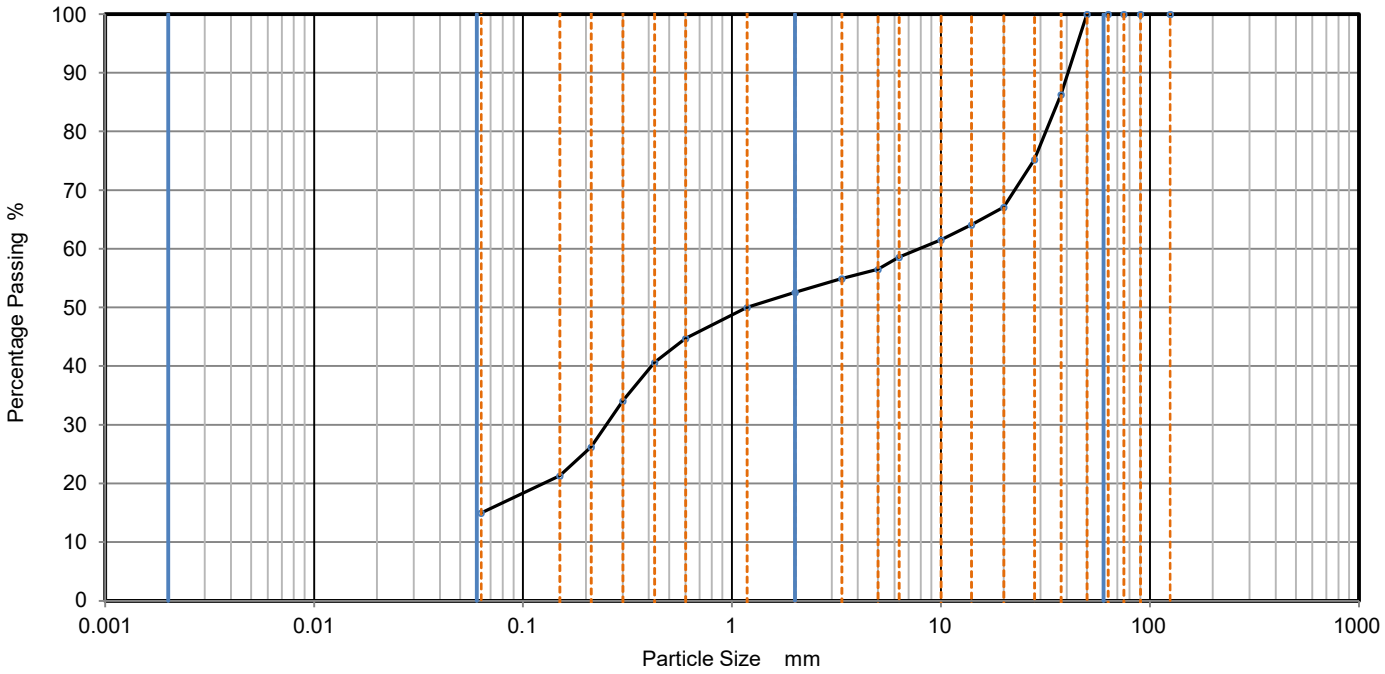
Preparation and testing in accordance with BS EN ISO 17892-4:2016 unless noted below

Date	Approved By		UKAS Accredited Laboratory No. 20632
17/10/2022 10:23	N O'Brien	[redacted]	

EXPLORATION & TESTING ASSOCIATES

PARTICLE SIZE DISTRIBUTION

				Job Ref	**C10172_2**
				Borehole/Pit No.	TP176
Site Name	Oxfordshire			Sample No.	B
Soil Description	Brown, Sandy, Gravelly CLAY			Depth, m	0.30
Specimen Reference		Specimen Depth	m	Sample Type	1
Test Method	BS EN ISO 17892-4:2016 - Wet & Dry Sieving			KeyLAB ID	EAT_2022101235



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	86		
28	75		
20	67		
14	64		
10	62		
6.3	59		
5	57		
3.35	55		
2	53		
1.18	50		
0.6	45		
0.425	41		
0.3	34		
0.212	26		
0.15	21		
0.063	15		

Method of Pre-Treatment	None

Sample Proportions	% dry mass
Very coarse	0
Gravel	47
Sand	38
Fines <0.063mm	15

Grading Analysis		
D_{100}	mm	
D_{60}	mm	7.91
D_{30}	mm	0.251
D_{10}	mm	
Uniformity Coefficient		
Curvature Coefficient		

Remarks

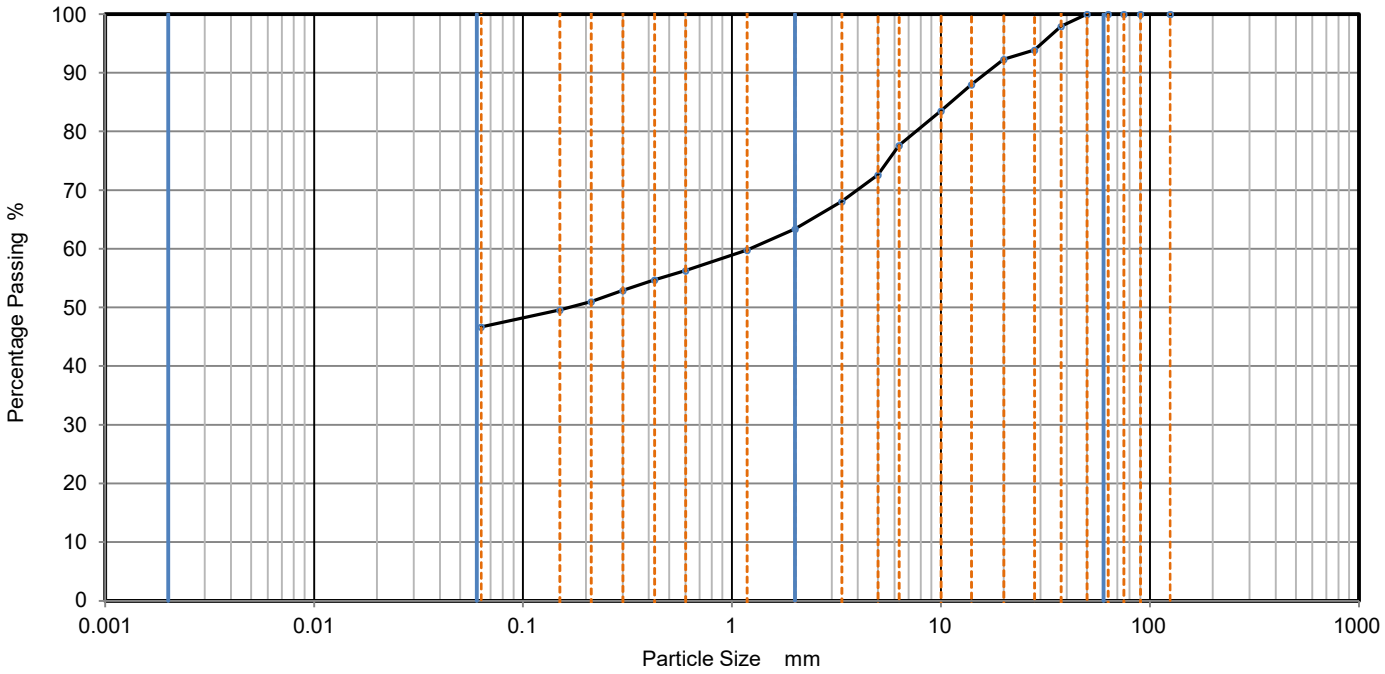
Preparation and testing in accordance with BS EN ISO 17892-4:2016 unless noted below

Date	Approved By		UKAS Accredited Laboratory No. 20632
17/10/2022 10:24	N O'Brien	[redacted]	

EXPLORATION & TESTING ASSOCIATES

PARTICLE SIZE DISTRIBUTION

				Job Ref	**C10172_2**
				Borehole/Pit No.	TP166
Site Name	Oxfordshire			Sample No.	B
Soil Description	Grey, Clayey, Very Sandy GRAVEL			Depth, m	0.30
Specimen Reference		Specimen Depth	m	Sample Type	1
Test Method	BS EN ISO 17892-4:2016 - Wet & Dry Sieving			KeyLAB ID	EAT_2022101228



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	98		
28	94		
20	92		
14	88		
10	84		
6.3	78		
5	73		
3.35	68		
2	63		
1.18	60		
0.6	56		
0.425	55		
0.3	53		
0.212	51		
0.15	50		
0.063	47		

Method of Pre-Treatment	None

Sample Proportions	% dry mass
Very coarse	0
Gravel	37
Sand	17
Fines <0.063mm	47

Grading Analysis		
D_{100}	mm	
D_{60}	mm	1.21
D_{30}	mm	
D_{10}	mm	
Uniformity Coefficient		
Curvature Coefficient		

Remarks

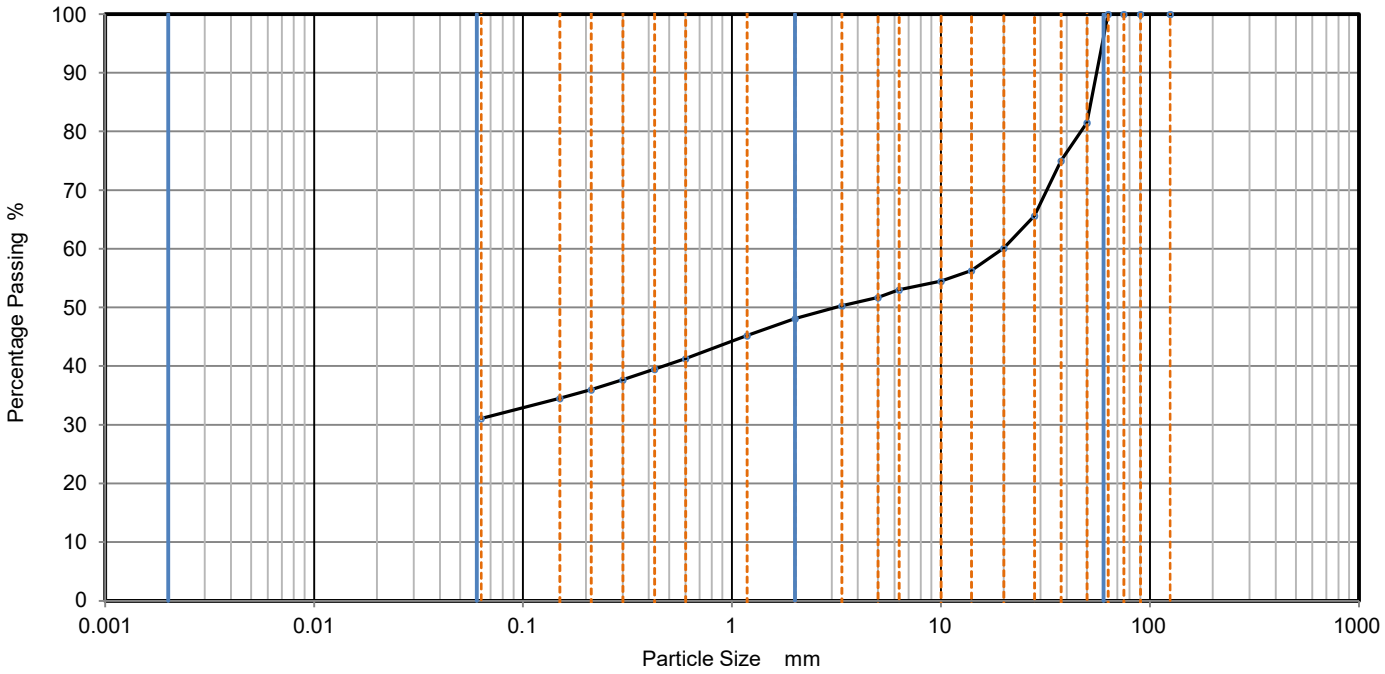
Preparation and testing in accordance with BS EN ISO 17892-4:2016 unless noted below

Date	Approved By		UKAS Accredited Laboratory No. 20632
17/10/2022 10:24	N O'Brien	[redacted]	

EXPLORATION & TESTING ASSOCIATES

PARTICLE SIZE DISTRIBUTION

				Job Ref	C10172_2
				Borehole/Pit No.	TP185
Site Name	Oxfordshire			Sample No.	B
Soil Description	Grey/Orange Sandy Gravelly CLAY with Occasional Cobbles (Large)			Depth, m	0.50
Specimen Reference		Specimen Depth	m	Sample Type	1
Test Method	BS EN ISO 17892-4:2016 - Wet & Dry Sieving			KeyLAB ID	EAT_2022101242



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	82		
37.5	75		
28	66		
20	60		
14	56		
10	55		
6.3	53		
5	52		
3.35	50		
2	48		
1.18	45		
0.6	41		
0.425	40		
0.3	38		
0.212	36		
0.15	35		
0.063	31		

Method of Pre-Treatment	None

Sample Proportions	% dry mass
Very coarse	0
Gravel	52
Sand	17
Fines <0.063mm	31

Grading Analysis		
D_{100}	mm	
D_{60}	mm	19.8
D_{30}	mm	
D_{10}	mm	
Uniformity Coefficient		
Curvature Coefficient		

Remarks

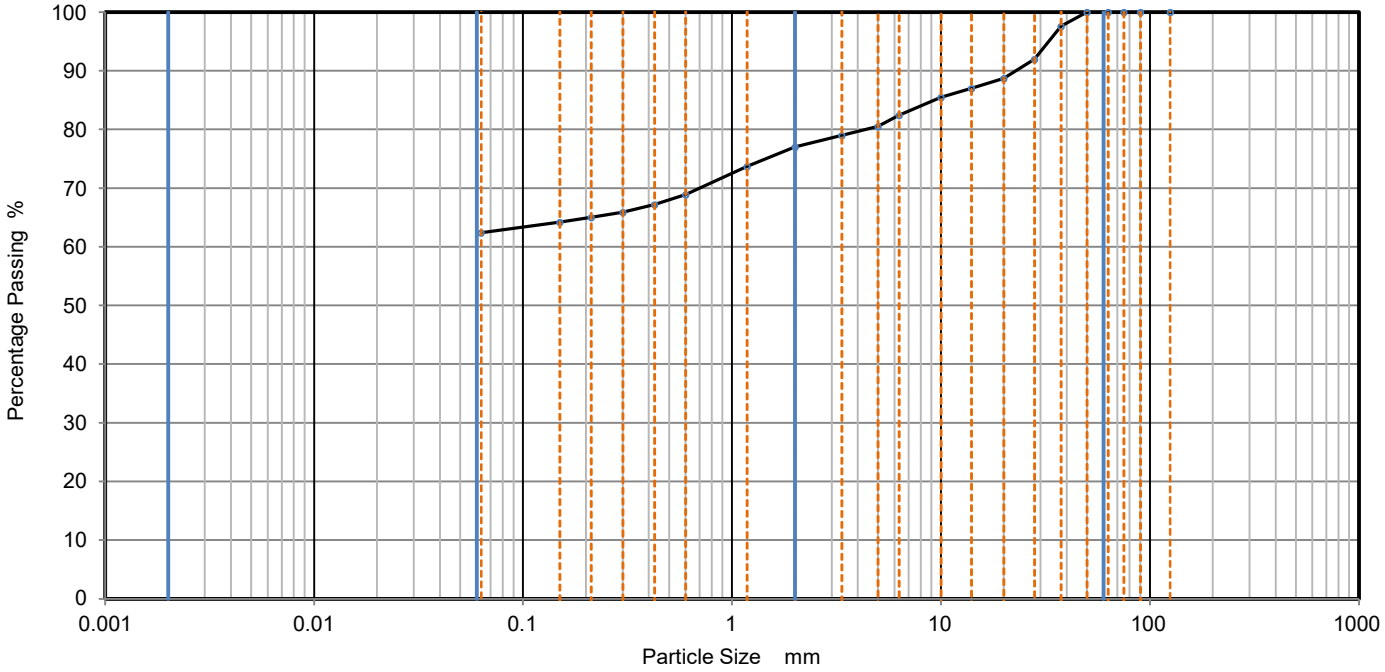
Preparation and testing in accordance with BS EN ISO 17892-4:2016 unless noted below

Date	Approved By		UKAS Accredited Laboratory No. 20632
17/10/2022 10:24	N O'Brien	[redacted]	

EXPLORATION & TESTING ASSOCIATES

PARTICLE SIZE DISTRIBUTION

				Job Ref	**C10172_2**
				Borehole/Pit No.	TP180
Site Name	Oxfordshire			Sample No.	B
Soil Description	Yellow / Brown, Very Sandy GRAVEL with Cobbles (Silty)			Depth, m	0.50
Specimen Reference		Specimen Depth	m	Sample Type	1
Test Method	BS EN ISO 17892-4:2016 - Wet & Dry Sieving			KeyLAB ID	EAT_2022101239



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	98		
28	92		
20	89		
14	87		
10	86		
6.3	82		
5	81		
3.35	79		
2	77		
1.18	74		
0.6	69		
0.425	67		
0.3	66		
0.212	65		
0.15	64		
0.063	62		

Method of Pre-Treatment	None

Sample Proportions	% dry mass
Very coarse	0
Gravel	23
Sand	15
Fines <0.063mm	62

Grading Analysis		
D_{100}	mm	
D_{60}	mm	
D_{30}	mm	
D_{10}	mm	
Uniformity Coefficient		
Curvature Coefficient		

Remarks

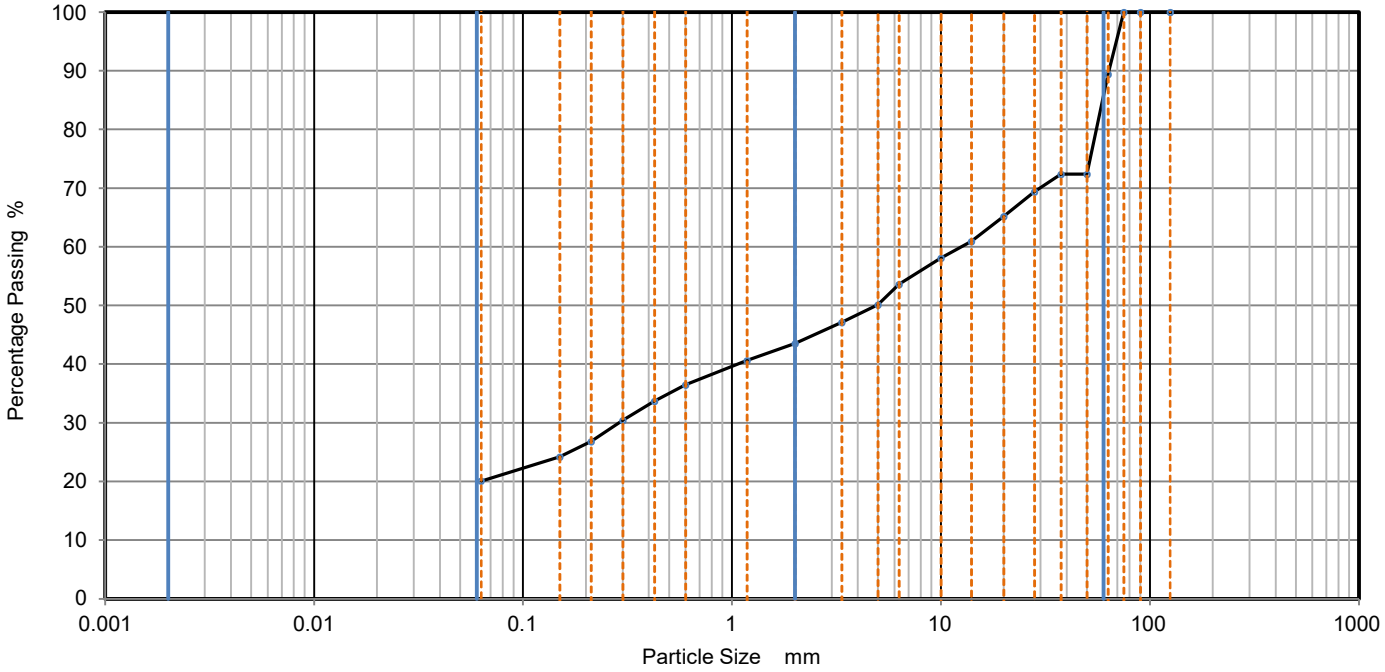
Preparation and testing in accordance with BS EN ISO 17892-4:2016 unless noted below

Date	Approved By		
17/10/2022 10:24	N O'Brien	[redacted]	UKAS Accredited Laboratory No. 20632

EXPLORATION & TESTING ASSOCIATES

PARTICLE SIZE DISTRIBUTION

				Job Ref	**C10172_2**
				Borehole/Pit No.	TP170
Site Name	Oxfordshire			Sample No.	B
Soil Description	Grey, Sandy, Slightly Gravelly CLAY			Depth, m	0.70
Specimen Reference		Specimen Depth	m	Sample Type	1
Test Method	BS EN ISO 17892-4:2016 - Wet & Dry Sieving			KeyLAB ID	EAT_2022101232



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	89		
50	72		
37.5	72		
28	69		
20	65		
14	61		
10	58		
6.3	54		
5	50		
3.35	47		
2	44		
1.18	41		
0.6	37		
0.425	34		
0.3	30		
0.212	27		
0.15	24		
0.063	20		

Method of Pre-Treatment	None

Sample Proportions	% dry mass
Very coarse	11
Gravel	46
Sand	23
Fines <0.063mm	20

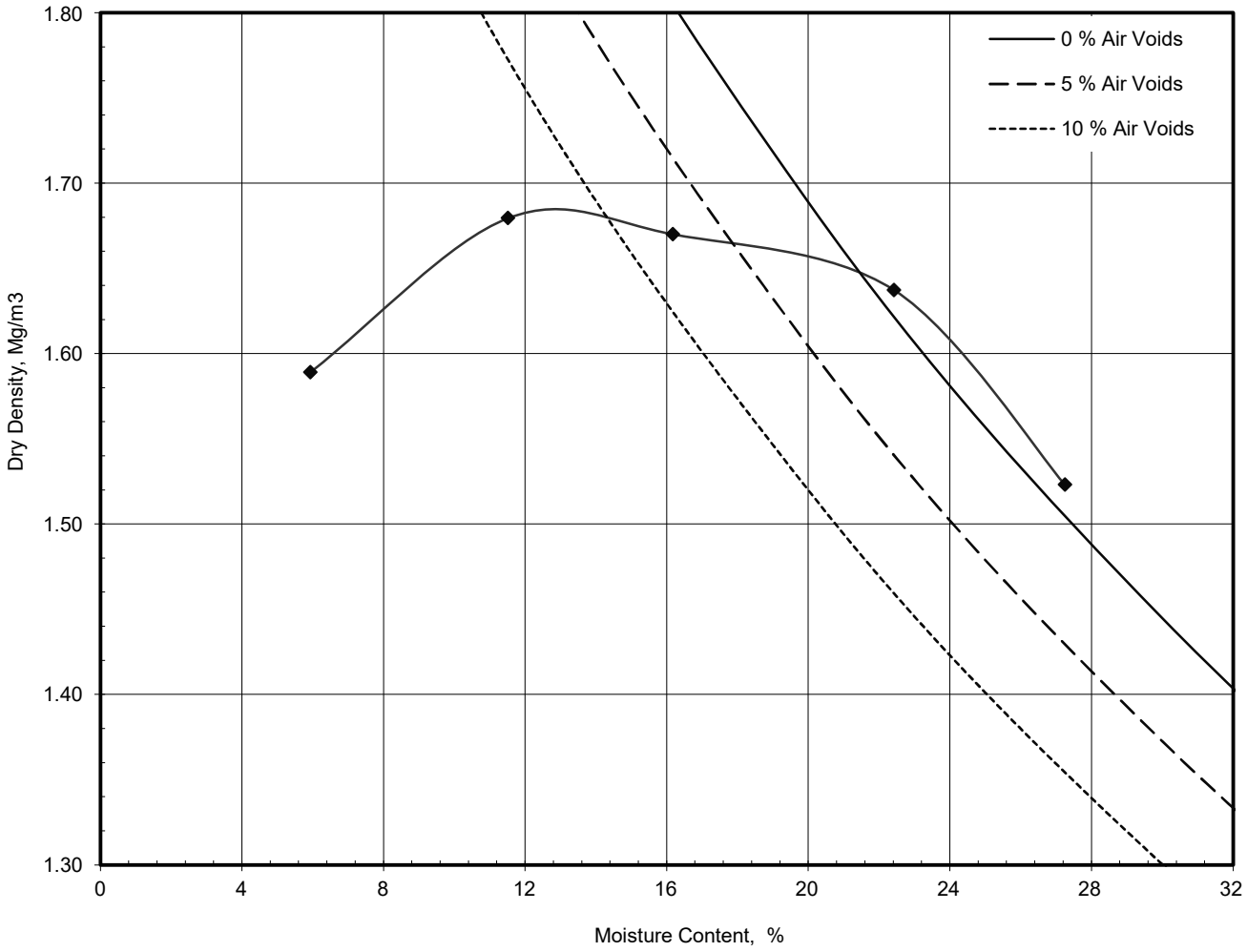
Grading Analysis		
D_{100}	mm	
D_{60}	mm	12.5
D_{30}	mm	0.289
D_{10}	mm	
Uniformity Coefficient		
Curvature Coefficient		

Remarks

Preparation and testing in accordance with BS EN ISO 17892-4:2016 unless noted below

Date	Approved By		UKAS Accredited Laboratory No. 20632
17/10/2022 10:24	N O'Brien	[redacted]	

EXPLORATION & TESTING ASSOCIATES	Dry Density / Moisture Content Relationship Light Compaction			Job Ref	C10172
				Borehole / Pit No	TP161
Site Name	Oxfordshire			Sample No	B
Soil Description	Grey, Slightly Sandy CLAY			Depth	1.00 m
Specimen Ref.		Specimen Depth	m	Sample Type	1
Test Method	BS1377:Part 4:1990, clause 3.3, 2.5kg rammer			Keylab ID	EAT_2022101226
				Compaction Test Reference/No.	



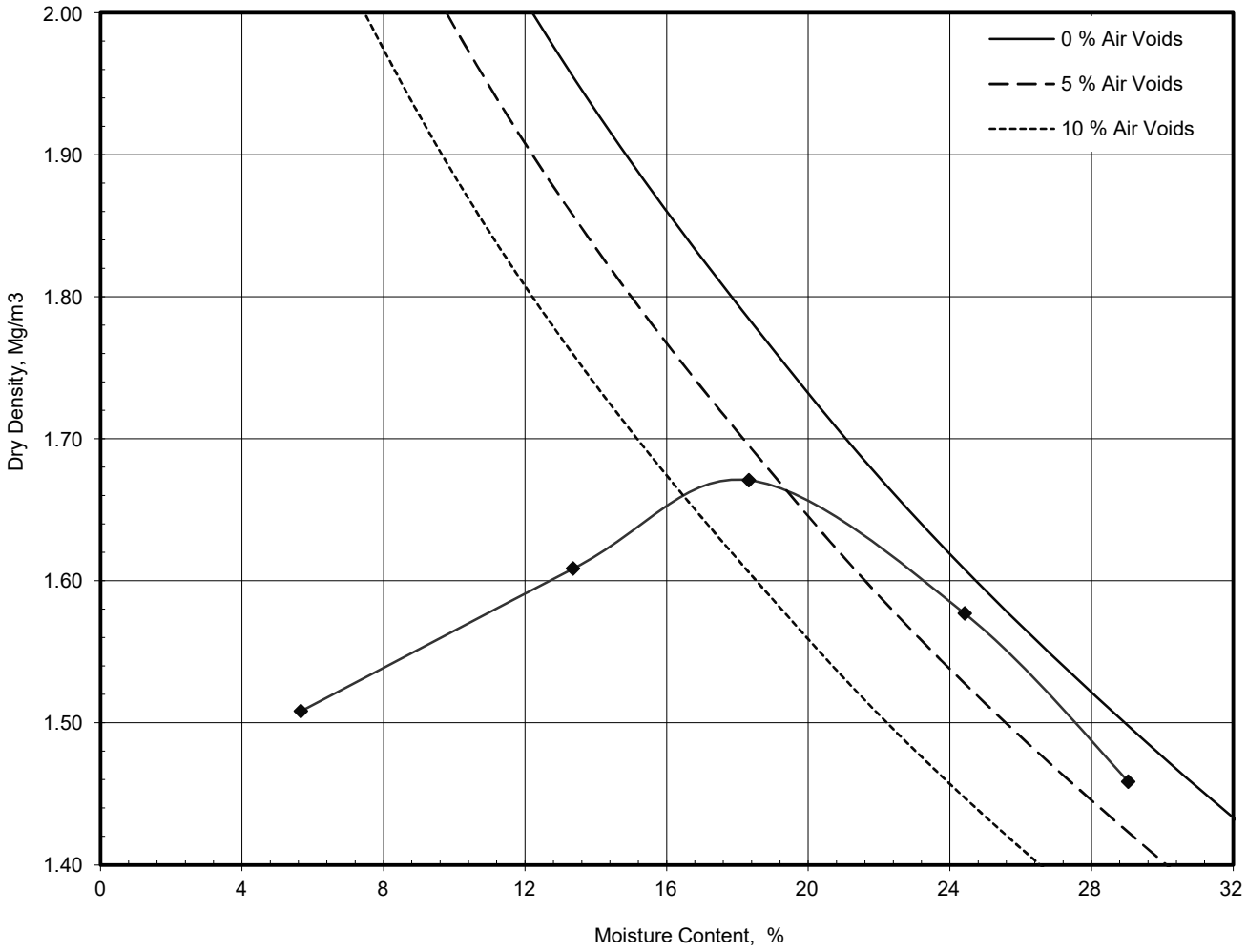
Preparation		Material used was air dried
Mould Type		One Litre
Samples Used		Single sample tested
Material Retained on 37.5 mm Sieve	%	0
Material Retained on 20.0 mm Sieve	%	0
Particle Density - Measured using gas jar	Mg/m³	2.55

Maximum Dry Density	Mg/m³	**1.68**

Optimum Moisture Content	%	**16**

Comments	Date	Checked By	Approved	UKAS Accredited Laboratory No. 20632
	17/10/2022 10:27	N. Hodson	N. O'Brien [redacted]	

EXPLORATION & TESTING ASSOCIATES	**Dry Density / Moisture Content Relationship Light Compaction**			Job Ref	**C10172**
				Borehole / Pit No	TP168
Site Name	**Oxfordshire**			Sample No	2
Soil Description	Grey slightly sandy slightly gravelly CLAY			Depth	1.10 m
Specimen Ref.		Specimen Depth	m	Sample Type	B
Test Method	BS1377:Part 4:1990, clause 3.3, 2.5kg rammer			Keylab ID	EAT_202210247
				Compaction Test Reference/No.	



Preparation		Material used was air dried
Mould Type		One Litre
Samples Used		Single sample tested
Material Retained on 37.5 mm Sieve	%	0
Material Retained on 20.0 mm Sieve	%	0
Particle Density - Assumed	Mg/m³	2.65

Maximum Dry Density	Mg/m³	**1.67**

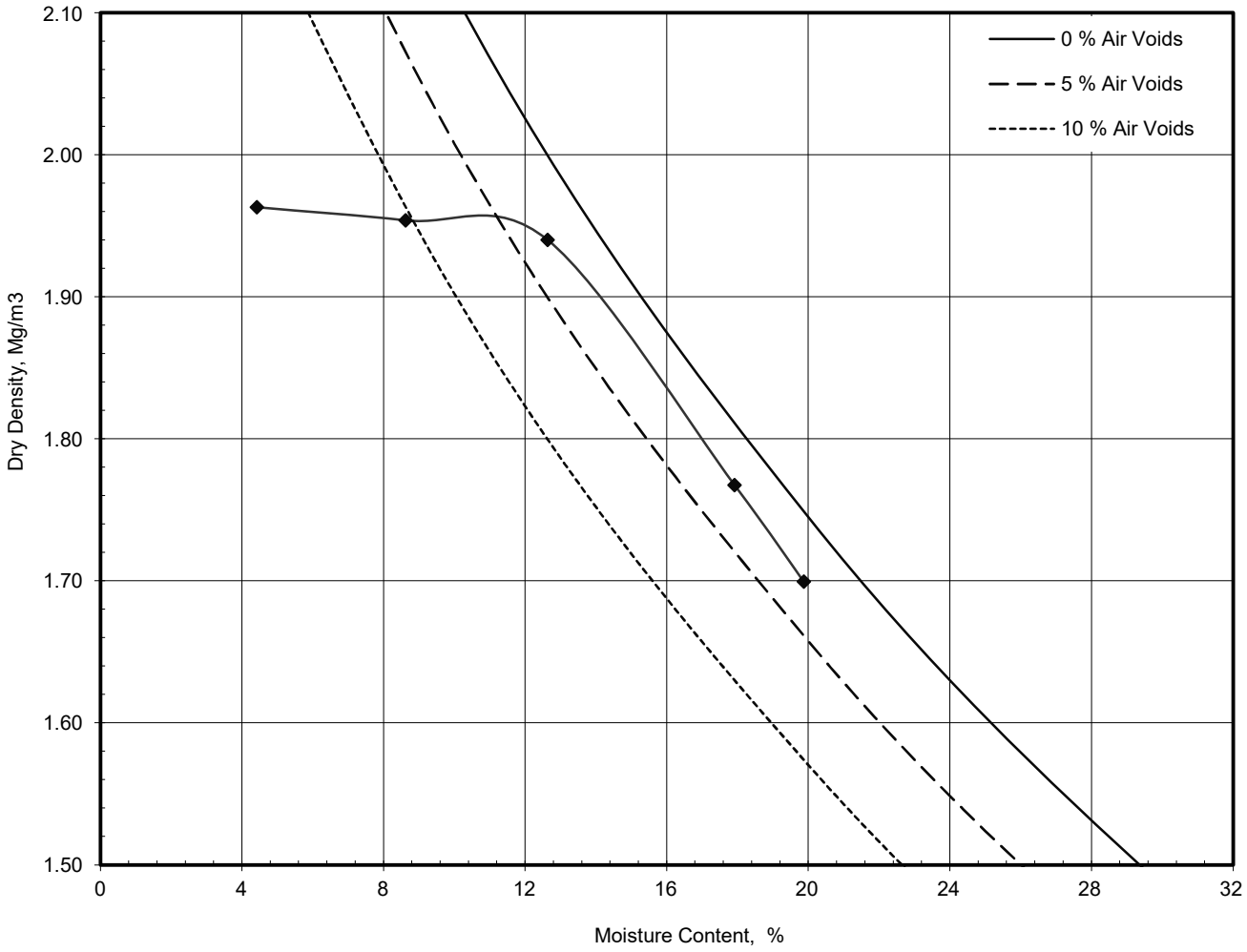
Optimum Moisture Content	%	**18**

Comments	Date	Checked By	Approved	UKAS Accredited Laboratory No. 20632
	25/10/2022 11:22	N. Hodson	N. O'Brien [redacted]	

EXPLORATION & TESTING ASSOCIATES	**Dry Density / Moisture Content Relationship Heavy Compaction**	Job Ref	**C10172_2**
		Borehole / Pit No	TP175

Site Name	**Oxfordshire**			Sample No	B
Soil Description	Yellow / Brown, Very Sandy GRAVEL with Cobbles (Silty)			Depth	0.60 m
Specimen Ref.		Specimen Depth	m	Sample Type	1
Test Method	BS1377:Part 4:1990, clause 3.6, 4.5kg rammer			Keylab ID	EAT_2022101233

Compaction Test Reference/No.



Preparation		Material used was air dried
Mould Type		CBR
Samples Used		Single sample tested
Material Retained on 37.5 mm Sieve	%	8
Material Retained on 20.0 mm Sieve	%	8
Particle Density - Measured using gas jar	Mg/m³	2.68

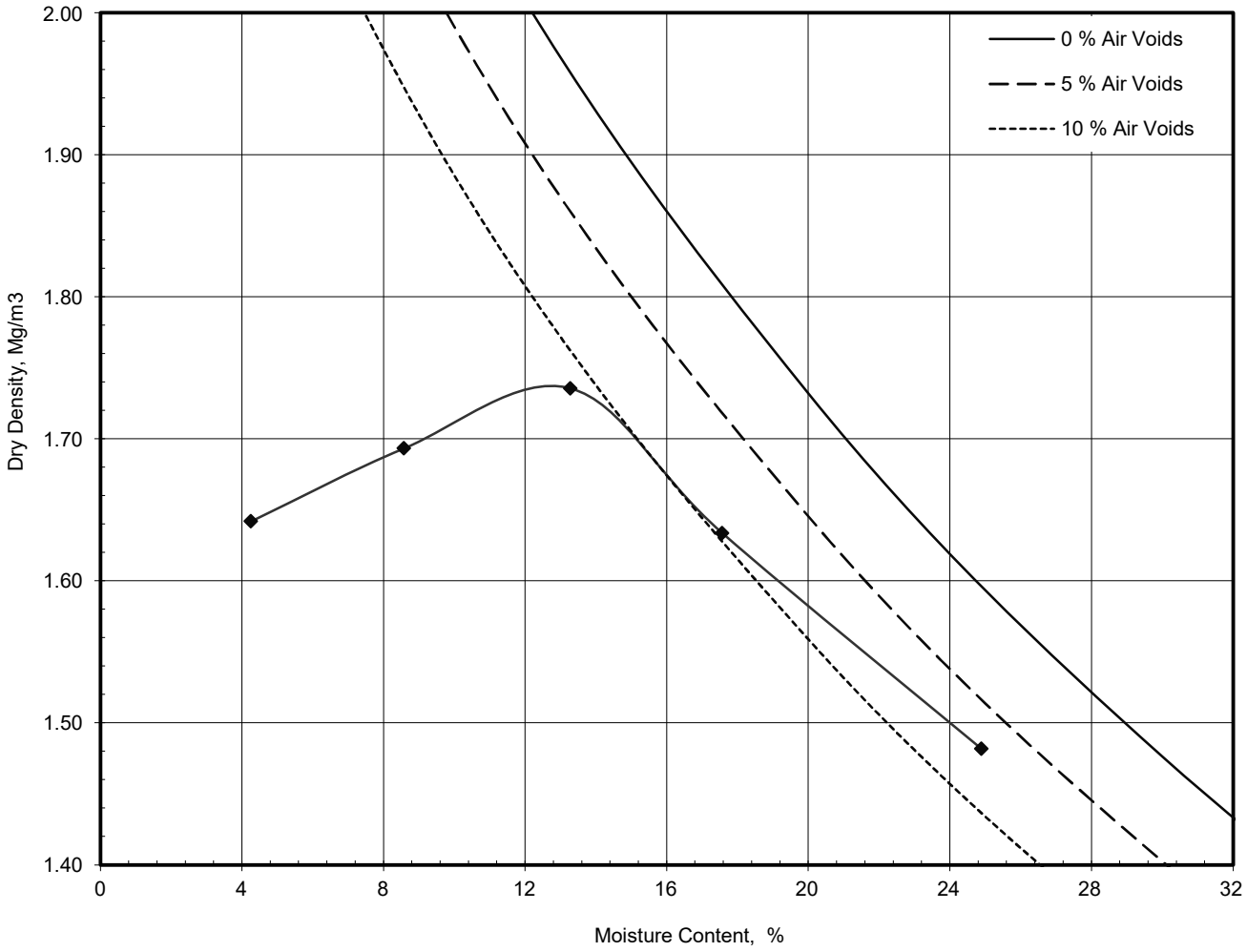
Maximum Dry Density	Mg/m³	**1.96**
Optimum Moisture Content	%	**13**

Comments	Date	Checked	Approved	
			N. O'Brien	UKAS Accredited Laboratory No. 20632
	17/10/2022 10:27	N. Hodson	[redacted]	

EXPLORATION & TESTING ASSOCIATES	**Dry Density / Moisture Content Relationship Heavy Compaction**	Job Ref	**C10172_2**
		Borehole / Pit No	TP186

Site Name	**Oxfordshire**			Sample No	1
Soil Description	Brown sandy gravelly CLAY with rootlets (topsoil)			Depth	0.40 m
Specimen Ref.		Specimen Depth	m	Sample Type	B
Test Method	BS1377:Part 4:1990, clause 3.5, 4.5kg rammer			Keylab ID	EAT_2022102420

Compaction Test Reference/No.



Preparation		Material used was air dried
Mould Type		One Litre
Samples Used		Separate specimens tested
Material Retained on 37.5 mm Sieve	%	4
Material Retained on 20.0 mm Sieve	%	3
Particle Density - Assumed	Mg/m³	2.65

Maximum Dry Density	Mg/m³	**1.74**
Optimum Moisture Content	%	**13**

Comments	Date	Checked	Approved	
			N. O'Brien	UKAS Accredited Laboratory No. 20632
	25/10/2022 11:17	N. Hodson	[redacted]	

EXPLORATION & TESTING ASSOCIATES

Particle Density by Gas Jar - Summary of Results

Project No.	Project Name
C10172_2	Oxfordshire

Hole No.	Sample				Soil Description at test horizon	Particle Density Mg/m^3	Remarks
	Ref	Top	Base	Type			
TP175	B	0.60		1	Yellow / Brown, Very Sandy GRAVEL with COBBLES	2.68	
TP167	D	0.80		3	Brown, Sandy, Gravelly CLAY	2.55	

Notes
Tests performed in accordance with BS 1377 unless annotated otherwise.
Gas Jar tests to BS1377: Part 2 : 1990, clause 8.2

Comments

Date: 17/10/2022 10:29

Approved: N.Hodson [redacted]

UKAS Accredited Laboratory No. 20632

EXPLORATION
& TESTING ASSOCIATES

APPENDIX 4: CHEMICAL LABORATORY TESTING

Results

Exploration & Testing Associates Limited
3 Siskin Drive
Middlemarch Business Park
Coventry
CV3 4FJ

e: results@explorationtesting.uk

i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

t: 01923 225404
f: 01923 237404
e: reception@i2analytical.com

Analytical Report Number : 22-86042

Project / Site name:	Oxfordshire	**Samples received on:**	16/09/2022
Your job number:	C10172	**Samples instructed on/ Analysis started on:**	26/09/2022
Your order number:	PO 2989	**Analysis completed by:**	30/09/2022
Report Issue Number:	1	**Report issued on:**	30/09/2022
Samples Analysed:	7 leachate samples - 18 soil samples		

Signed [redacted]

[redacted]
Technical Reviewer
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

Excel copies of reports are only valid when accompanied by this PDF certificate.

Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.

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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 22-86042
Project / Site name: Oxfordshire
Your Order No: PO 2989

Lab Sample Number				2435575	2435576	2435577	2435578	2435579
Sample Reference				TP161	TP165	TP167	TP167	TP169
Sample Number				1	1	1	2	2
Depth (m)				0.10	0.10	0.10	0.50	0.41
Date Sampled				15/09/2022	15/09/2022	15/09/2022	15/09/2022	15/09/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	7.2	12	8.2	13	9
Total mass of sample received	kg	0.001	NONE	0.9	0.9	0.9	0.9	0.9
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	-	-	-	-
Asbestos Analyst ID	N/A	N/A	N/A	MJN	N/A	N/A	N/A	N/A
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	7.5	8.0	7.8	8.4	8.1
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Complex Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Free Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.0038	0.0032	0.0042	0.0026	< 0.0013
Total Sulphur	mg/kg	50	MCERTS	610	540	520	400	250
Organic Matter (automated)	%	0.1	MCERTS	4.9	3.9	3.9	2.9	1
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	0.23	< 0.05	< 0.05	< 0.05	< 0.05
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	0.67	< 0.05	< 0.05	< 0.05	< 0.05
Pyrene	mg/kg	0.05	MCERTS	0.69	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.4	< 0.05	< 0.05	< 0.05	< 0.05
Chrysene	mg/kg	0.05	MCERTS	0.37	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	0.39	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.21	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.37	< 0.05	< 0.05	< 0.05	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	3.33	< 0.80	< 0.80	< 0.80	< 0.80
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	12	11	12	11	11
Barium (aqua regia extractable)	mg/kg	1	MCERTS	54	53	56	51	37
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	1	1.3	1.6	1.4	1.2
Boron (water soluble)	mg/kg	0.2	MCERTS	3.1	3.6	2.7	2.5	1.6
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	0.4	0.6	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	25	31	39	32	30
Copper (aqua regia extractable)	mg/kg	1	MCERTS	14	13	28	11	8.6
Lead (aqua regia extractable)	mg/kg	1	MCERTS	25	22	32	18	11
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	18	20	24	23	20

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The results included within the report relate only to the sample(s) submitted for testing.

Analytical Report Number: 22-86042
Project / Site name: Oxfordshire
Your Order No: PO 2989

Lab Sample Number				2435575	2435576	2435577	2435578	2435579
Sample Reference				TP161	TP165	TP167	TP167	TP169
Sample Number				1	1	1	2	2
Depth (m)				0.10	0.10	0.10	0.50	0.41
Date Sampled				15/09/2022	15/09/2022	15/09/2022	15/09/2022	15/09/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	43	47	56	47	42
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	62	69	280	62	40

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The results included within the report relate only to the sample(s) submitted for testing.

Analytical Report Number: 22-86042
Project / Site name: Oxfordshire
Your Order No: PO 2989

Lab Sample Number				2435575	2435576	2435577	2435578	2435579
Sample Reference				TP161	TP165	TP167	TP167	TP169
Sample Number				1	1	1	2	2
Depth (m)				0.10	0.10	0.10	0.50	0.41
Date Sampled				15/09/2022	15/09/2022	15/09/2022	15/09/2022	15/09/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics & Oxygenates								
Benzene	µg/kg	1	MCERTS	-	-	-	-	-
Toluene	µg/kg	1	MCERTS	-	-	-	-	-
Ethylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
p & m-xylene	µg/kg	1	MCERTS	-	-	-	-	-
o-xylene	µg/kg	1	MCERTS	-	-	-	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	-	-	-
Petroleum Hydrocarbons								
TPH C10 - C40 $_{EH_CU_1D_TOTAL}$	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPH2 (C6 - C10) $_{HS_1D_TOTAL}$	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aliphatic >EC5 - EC6 $_{HS_1D_AL}$	mg/kg	0.001	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC6 - EC8 $_{HS_1D_AL}$	mg/kg	0.001	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC8 - EC10 $_{HS_1D_AL}$	mg/kg	0.001	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC10 - EC12 $_{EH_CU_1D_AL}$	mg/kg	1	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC12 - EC16 $_{EH_CU_1D_AL}$	mg/kg	2	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC16 - EC21 $_{EH_CU_1D_AL}$	mg/kg	8	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC21 - EC35 $_{EH_CU_1D_AL}$	mg/kg	8	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic (EC5 - EC35) $_{EH_CU+HS_1D_AL}$	mg/kg	10	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC5 - EC7 $_{HS_1D_AR}$	mg/kg	0.001	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC7 - EC8 $_{HS_1D_AR}$	mg/kg	0.001	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC8 - EC10 $_{HS_1D_AR}$	mg/kg	0.001	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC10 - EC12 $_{EH_CU_1D_AR}$	mg/kg	1	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC12 - EC16 $_{EH_CU_1D_AR}$	mg/kg	2	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC16 - EC21 $_{EH_CU_1D_AR}$	mg/kg	10	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC21 - EC35 $_{EH_CU_1D_AR}$	mg/kg	10	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic (EC5 - EC35) $_{EH_CU+HS_1D_AR}$	mg/kg	10	MCERTS	-	-	-	-	-
Pesticide and Herbicide Screen								
GCMS Pesticide Screen		N/A	NONE	-	-	None Detected	-	-
Herbicides								
Aldicarb	µg/kg	10	NONE	-	-	< 10	-	-
Aldicarb Sulfone	µg/kg	10	NONE	-	-	< 10	-	-
Aldicarb Sulfoxide	µg/kg	50	NONE	-	-	< 50	-	-
Atrazine	µg/kg	10	NONE	-	-	< 10	-	-
Carbaryl	µg/kg	10	NONE	-	-	< 10	-	-
Carbofuran	µg/kg	10	NONE	-	-	< 10	-	-
Carbofuran, 3-OH	µg/kg	20	NONE	-	-	< 20	-	-
Chlortoluron	µg/kg	10	NONE	-	-	< 10	-	-
Cyanazine	µg/kg	10	NONE	-	-	< 10	-	-
Diflubenzuron	µg/kg	50	NONE	-	-	< 50	-	-
Diuron	µg/kg	10	NONE	-	-	< 10	-	-
Fluometuron	µg/kg	10	NONE	-	-	< 10	-	-
Isoproturon	µg/kg	10	NONE	-	-	< 10	-	-
Linuron	µg/kg	20	NONE	-	-	< 20	-	-
Methiocarb	µg/kg	10	NONE	-	-	< 10	-	-
Methomyl	µg/kg	10	NONE	-	-	< 10	-	-
Oxamyl	µg/kg	10	NONE	-	-	< 10	-	-

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Analytical Report Number: 22-86042
Project / Site name: Oxfordshire
Your Order No: PO 2989

Lab Sample Number				2435575	2435576	2435577	2435578	2435579
Sample Reference				TP161	TP165	TP167	TP167	TP169
Sample Number				1	1	1	2	2
Depth (m)				0.10	0.10	0.10	0.50	0.41
Date Sampled				15/09/2022	15/09/2022	15/09/2022	15/09/2022	15/09/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Prometryn	µg/kg	10	NONE	-	-	< 10	-	-
Propazine	µg/kg	10	NONE	-	-	< 10	-	-
Propoxur	µg/kg	10	NONE	-	-	< 10	-	-
Siduron	µg/kg	10	NONE	-	-	< 10	-	-
Simazine	µg/kg	10	NONE	-	-	< 10	-	-
Tebuthiuron	µg/kg	10	NONE	-	-	< 10	-	-
Terbuthylazine	µg/kg	10	NONE	-	-	< 10	-	-
Terbutryn	µg/kg	10	NONE	-	-	< 10	-	-
Thiadiazuron	µg/kg	10	NONE	-	-	< 10	-	-
Trietazine	µg/kg	10	NONE	-	-	< 10	-	-

U/S = Unsuitable Sample I/S = Insufficient Sample

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Analytical Report Number: 22-86042
Project / Site name: Oxfordshire
Your Order No: PO 2989

Lab Sample Number				2435580	2435581	2435582	2435583	2435584
Sample Reference				TP170	TP173	TP176	TP176	TP180
Sample Number				1	2	1	2	1
Depth (m)				0.05	0.70	0.15	0.80	0.10
Date Sampled				15/09/2022	15/09/2022	15/09/2022	15/09/2022	15/09/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	32
Moisture Content	%	0.01	NONE	8.7	6.7	11	6.9	8.5
Total mass of sample received	kg	0.001	NONE	0.9	0.9	0.9	0.9	1.2
Asbestos in Soil	Type	N/A	ISO 17025	-	-	-	-	-
Asbestos Analyst ID	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	7.8	8.7	7.8	8.7	8.0
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Complex Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Free Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.0032	0.0026	0.0032	0.0021	0.012
Total Sulphur	mg/kg	50	MCERTS	500	420	530	430	640
Organic Matter (automated)	%	0.1	MCERTS	3.7	0.7	4.1	0.7	4.2
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	< 0.80	< 0.80	< 0.80	< 0.80
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	15	6.5	16	5.3	18
Barium (aqua regia extractable)	mg/kg	1	MCERTS	73	26	84	24	70
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	1.3	0.49	1.2	0.48	1
Boron (water soluble)	mg/kg	0.2	MCERTS	2.8	0.4	1.6	0.5	2.8
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	33	13	30	12	29
Copper (aqua regia extractable)	mg/kg	1	MCERTS	18	7.2	13	6.1	15
Lead (aqua regia extractable)	mg/kg	1	MCERTS	28	6.7	26	6.7	24
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	25	9.7	25	8.9	22

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Analytical Report Number: 22-86042
Project / Site name: Oxfordshire
Your Order No: PO 2989

Lab Sample Number				2435580	2435581	2435582	2435583	2435584
Sample Reference				TP170	TP173	TP176	TP176	TP180
Sample Number				1	2	1	2	1
Depth (m)				0.05	0.70	0.15	0.80	0.10
Date Sampled				15/09/2022	15/09/2022	15/09/2022	15/09/2022	15/09/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	54	24	52	23	51
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	70	28	68	26	74

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Project / Site name: Oxfordshire
Your Order No: PO 2989

Lab Sample Number				2435580	2435581	2435582	2435583	2435584
Sample Reference				TP170	TP173	TP176	TP176	TP180
Sample Number				1	2	1	2	1
Depth (m)				0.05	0.70	0.15	0.80	0.10
Date Sampled				15/09/2022	15/09/2022	15/09/2022	15/09/2022	15/09/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics & Oxygenates								
Benzene	µg/kg	1	MCERTS	-	-	-	-	-
Toluene	µg/kg	1	MCERTS	-	-	-	-	-
Ethylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
p & m-xylene	µg/kg	1	MCERTS	-	-	-	-	-
o-xylene	µg/kg	1	MCERTS	-	-	-	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	-	-	-
Petroleum Hydrocarbons								
TPH C10 - C40 $_{EH_CU_1D_TOTAL}$	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPH2 (C6 - C10) $_{HS_1D_TOTAL}$	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aliphatic >EC5 - EC6 $_{HS_1D_AL}$	mg/kg	0.001	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC6 - EC8 $_{HS_1D_AL}$	mg/kg	0.001	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC8 - EC10 $_{HS_1D_AL}$	mg/kg	0.001	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC10 - EC12 $_{EH_CU_1D_AL}$	mg/kg	1	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC12 - EC16 $_{EH_CU_1D_AL}$	mg/kg	2	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC16 - EC21 $_{EH_CU_1D_AL}$	mg/kg	8	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC21 - EC35 $_{EH_CU_1D_AL}$	mg/kg	8	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic (EC5 - EC35) $_{EH_CU+HS_1D_AL}$	mg/kg	10	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC5 - EC7 $_{HS_1D_AR}$	mg/kg	0.001	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC7 - EC8 $_{HS_1D_AR}$	mg/kg	0.001	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC8 - EC10 $_{HS_1D_AR}$	mg/kg	0.001	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC10 - EC12 $_{EH_CU_1D_AR}$	mg/kg	1	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC12 - EC16 $_{EH_CU_1D_AR}$	mg/kg	2	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC16 - EC21 $_{EH_CU_1D_AR}$	mg/kg	10	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC21 - EC35 $_{EH_CU_1D_AR}$	mg/kg	10	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic (EC5 - EC35) $_{EH_CU+HS_1D_AR}$	mg/kg	10	MCERTS	-	-	-	-	-
Pesticide and Herbicide Screen								
GCMS Pesticide Screen		N/A	NONE	None Detected	-	None Detected	-	None Detected
Herbicides								
Aldicarb	µg/kg	10	NONE	< 10	-	< 10	-	< 10
Aldicarb Sulfone	µg/kg	10	NONE	< 10	-	< 10	-	< 10
Aldicarb Sulfoxide	µg/kg	50	NONE	< 50	-	< 50	-	< 50
Atrazine	µg/kg	10	NONE	< 10	-	< 10	-	< 10
Carbaryl	µg/kg	10	NONE	< 10	-	< 10	-	< 10
Carbofuran	µg/kg	10	NONE	< 10	-	< 10	-	< 10
Carbofuran, 3-OH	µg/kg	20	NONE	< 20	-	< 20	-	< 20
Chlortoluron	µg/kg	10	NONE	< 10	-	< 10	-	< 10
Cyanazine	µg/kg	10	NONE	< 10	-	< 10	-	< 10
Diflubenzuron	µg/kg	50	NONE	< 50	-	< 50	-	< 50
Diuron	µg/kg	10	NONE	< 10	-	< 10	-	< 10
Fluometuron	µg/kg	10	NONE	< 10	-	< 10	-	< 10
Isoproturon	µg/kg	10	NONE	< 10	-	< 10	-	< 10
Linuron	µg/kg	20	NONE	< 20	-	< 20	-	< 20
Methiocarb	µg/kg	10	NONE	< 10	-	< 10	-	< 10
Methomyl	µg/kg	10	NONE	< 10	-	< 10	-	< 10
Oxamyl	µg/kg	10	NONE	< 10	-	< 10	-	< 10

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Analytical Report Number: 22-86042
Project / Site name: Oxfordshire
Your Order No: PO 2989

Lab Sample Number				2435580	2435581	2435582	2435583	2435584
Sample Reference				TP170	TP173	TP176	TP176	TP180
Sample Number				1	2	1	2	1
Depth (m)				0.05	0.70	0.15	0.80	0.10
Date Sampled				15/09/2022	15/09/2022	15/09/2022	15/09/2022	15/09/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Prometryn	µg/kg	10	NONE	< 10	-	< 10	-	< 10
Propazine	µg/kg	10	NONE	< 10	-	< 10	-	< 10
Propoxur	µg/kg	10	NONE	< 10	-	< 10	-	< 10
Siduron	µg/kg	10	NONE	< 10	-	< 10	-	< 10
Simazine	µg/kg	10	NONE	< 10	-	< 10	-	< 10
Tebuthiuron	µg/kg	10	NONE	< 10	-	< 10	-	< 10
Terbuthylazine	µg/kg	10	NONE	< 10	-	< 10	-	< 10
Terbutryn	µg/kg	10	NONE	< 10	-	< 10	-	< 10
Thiadiazuron	µg/kg	10	NONE	< 10	-	< 10	-	< 10
Trietazine	µg/kg	10	NONE	< 10	-	< 10	-	< 10

U/S = Unsuitable Sample I/S = Insufficient Sample

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Analytical Report Number: 22-86042
Project / Site name: Oxfordshire
Your Order No: PO 2989

Lab Sample Number				2435585	2435586	2435587	2435588	2435589
Sample Reference				TP180	TP181	TP183	TP183	TP185
Sample Number				2	1	1	2	2
Depth (m)				0.60	0.10	0.05	0.45	0.30
Date Sampled				15/09/2022	15/09/2022	15/09/2022	15/09/2022	15/09/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	-	38	< 0.1
Moisture Content	%	0.01	NONE	6.4	7.9	-	8.1	15
Total mass of sample received	kg	0.001	NONE	0.9	0.9	-	0.9	0.9
Asbestos in Soil	Type	N/A	ISO 17025	-	Not-detected	Not-detected	-	-
Asbestos Analyst ID	N/A	N/A	N/A	N/A	MJN	MJN	N/A	N/A
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	8.6	8.2	-	8.5	8.1
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	-	< 1.0	< 1.0
Complex Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	-	< 1.0	< 1.0
Free Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	-	< 1.0	< 1.0
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.0027	0.0034	-	0.0045	0.014
Total Sulphur	mg/kg	50	MCERTS	360	440	-	350	240
Organic Matter (automated)	%	0.1	MCERTS	0.8	2.9	-	1.2	1.3
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	-	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	< 0.05	< 0.05
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	< 0.05	< 0.05
Pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	< 0.05	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	< 0.05	< 0.05
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	< 0.05	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	< 0.05	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	< 0.05	< 0.05
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	< 0.80	-	< 0.80	< 0.80
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	12	19	-	8.7	6.3
Barium (aqua regia extractable)	mg/kg	1	MCERTS	23	57	-	46	41
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.42	1.1	-	1.3	1.7
Boron (water soluble)	mg/kg	0.2	MCERTS	0.8	1.5	-	0.8	1.2
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	-	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	-	< 1.8	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	12	29	-	29	33
Copper (aqua regia extractable)	mg/kg	1	MCERTS	11	12	-	21	60
Lead (aqua regia extractable)	mg/kg	1	MCERTS	11	19	-	19	42
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	-	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	11	21	-	22	30

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Analytical Report Number: 22-86042
Project / Site name: Oxfordshire
Your Order No: PO 2989

Lab Sample Number				2435585	2435586	2435587	2435588	2435589
Sample Reference				TP180	TP181	TP183	TP183	TP185
Sample Number				2	1	1	2	2
Depth (m)				0.60	0.10	0.05	0.45	0.30
Date Sampled				15/09/2022	15/09/2022	15/09/2022	15/09/2022	15/09/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	-	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	24	65	-	41	45
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	76	51	-	130	260

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Analytical Report Number: 22-86042
Project / Site name: Oxfordshire
Your Order No: PO 2989

Lab Sample Number				2435585	2435586	2435587	2435588	2435589
Sample Reference				TP180	TP181	TP183	TP183	TP185
Sample Number				2	1	1	2	2
Depth (m)				0.60	0.10	0.05	0.45	0.30
Date Sampled				15/09/2022	15/09/2022	15/09/2022	15/09/2022	15/09/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics & Oxygenates								
Benzene	µg/kg	1	MCERTS	-	-	-	< 1.0	-
Toluene	µg/kg	1	MCERTS	-	-	-	< 1.0	-
Ethylbenzene	µg/kg	1	MCERTS	-	-	-	< 1.0	-
p & m-xylene	µg/kg	1	MCERTS	-	-	-	< 1.0	-
o-xylene	µg/kg	1	MCERTS	-	-	-	< 1.0	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	-	< 1.0	-
Petroleum Hydrocarbons								
TPH C10 - C40 $_{EH_CU_1D_TOTAL}$	mg/kg	10	MCERTS	< 10	< 10	-	< 10	< 10
TPH2 (C6 - C10) $_{HS_1D_TOTAL}$	mg/kg	0.1	MCERTS	< 0.1	< 0.1	-	< 0.1	< 0.1
TPH-CWG - Aliphatic >EC5 - EC6 $_{HS_1D_AL}$	mg/kg	0.001	MCERTS	-	-	-	< 0.001	-
TPH-CWG - Aliphatic >EC6 - EC8 $_{HS_1D_AL}$	mg/kg	0.001	MCERTS	-	-	-	< 0.001	-
TPH-CWG - Aliphatic >EC8 - EC10 $_{HS_1D_AL}$	mg/kg	0.001	MCERTS	-	-	-	< 0.001	-
TPH-CWG - Aliphatic >EC10 - EC12 $_{EH_CU_1D_AL}$	mg/kg	1	MCERTS	-	-	-	< 1.0	-
TPH-CWG - Aliphatic >EC12 - EC16 $_{EH_CU_1D_AL}$	mg/kg	2	MCERTS	-	-	-	< 2.0	-
TPH-CWG - Aliphatic >EC16 - EC21 $_{EH_CU_1D_AL}$	mg/kg	8	MCERTS	-	-	-	< 8.0	-
TPH-CWG - Aliphatic >EC21 - EC35 $_{EH_CU_1D_AL}$	mg/kg	8	MCERTS	-	-	-	< 8.0	-
TPH-CWG - Aliphatic (EC5 - EC35) $_{EH_CU+HS_1D_AL}$	mg/kg	10	MCERTS	-	-	-	< 10	-
TPH-CWG - Aromatic >EC5 - EC7 $_{HS_1D_AR}$	mg/kg	0.001	MCERTS	-	-	-	< 0.001	-
TPH-CWG - Aromatic >EC7 - EC8 $_{HS_1D_AR}$	mg/kg	0.001	MCERTS	-	-	-	< 0.001	-
TPH-CWG - Aromatic >EC8 - EC10 $_{HS_1D_AR}$	mg/kg	0.001	MCERTS	-	-	-	< 0.001	-
TPH-CWG - Aromatic >EC10 - EC12 $_{EH_CU_1D_AR}$	mg/kg	1	MCERTS	-	-	-	< 1.0	-
TPH-CWG - Aromatic >EC12 - EC16 $_{EH_CU_1D_AR}$	mg/kg	2	MCERTS	-	-	-	< 2.0	-
TPH-CWG - Aromatic >EC16 - EC21 $_{EH_CU_1D_AR}$	mg/kg	10	MCERTS	-	-	-	< 10	-
TPH-CWG - Aromatic >EC21 - EC35 $_{EH_CU_1D_AR}$	mg/kg	10	MCERTS	-	-	-	< 10	-
TPH-CWG - Aromatic (EC5 - EC35) $_{EH_CU+HS_1D_AR}$	mg/kg	10	MCERTS	-	-	-	< 10	-
Pesticide and Herbicide Screen								
GCMS Pesticide Screen		N/A	NONE	-	None Detected	-	-	-
Herbicides								
Aldicarb	µg/kg	10	NONE	-	< 10	-	-	-
Aldicarb Sulfone	µg/kg	10	NONE	-	< 10	-	-	-
Aldicarb Sulfoxide	µg/kg	50	NONE	-	< 50	-	-	-
Atrazine	µg/kg	10	NONE	-	< 10	-	-	-
Carbaryl	µg/kg	10	NONE	-	< 10	-	-	-
Carbofuran	µg/kg	10	NONE	-	< 10	-	-	-
Carbofuran, 3-OH	µg/kg	20	NONE	-	< 20	-	-	-
Chlortoluron	µg/kg	10	NONE	-	< 10	-	-	-
Cyanazine	µg/kg	10	NONE	-	< 10	-	-	-
Diflubenzuron	µg/kg	50	NONE	-	< 50	-	-	-
Diuron	µg/kg	10	NONE	-	< 10	-	-	-
Fluometuron	µg/kg	10	NONE	-	< 10	-	-	-
Isoproturon	µg/kg	10	NONE	-	< 10	-	-	-
Linuron	µg/kg	20	NONE	-	< 20	-	-	-
Methiocarb	µg/kg	10	NONE	-	< 10	-	-	-
Methomyl	µg/kg	10	NONE	-	< 10	-	-	-
Oxamyl	µg/kg	10	NONE	-	< 10	-	-	-

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Analytical Report Number: 22-86042
Project / Site name: Oxfordshire
Your Order No: PO 2989

Lab Sample Number				2435585	2435586	2435587	2435588	2435589
Sample Reference				TP180	TP181	TP183	TP183	TP185
Sample Number				2	1	1	2	2
Depth (m)				0.60	0.10	0.05	0.45	0.30
Date Sampled				15/09/2022	15/09/2022	15/09/2022	15/09/2022	15/09/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Prometryn	µg/kg	10	NONE	-	< 10	-	-	-
Propazine	µg/kg	10	NONE	-	< 10	-	-	-
Propoxur	µg/kg	10	NONE	-	< 10	-	-	-
Siduron	µg/kg	10	NONE	-	< 10	-	-	-
Simazine	µg/kg	10	NONE	-	< 10	-	-	-
Tebuthiuron	µg/kg	10	NONE	-	< 10	-	-	-
Terbuthylazine	µg/kg	10	NONE	-	< 10	-	-	-
Terbutryn	µg/kg	10	NONE	-	< 10	-	-	-
Thiadiazuron	µg/kg	10	NONE	-	< 10	-	-	-
Trietazine	µg/kg	10	NONE	-	< 10	-	-	-

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Analytical Report Number: 22-86042
Project / Site name: Oxfordshire
Your Order No: PO 2989

Lab Sample Number				2435590	2435591	2435592
Sample Reference				TP187	TP187	TP189
Sample Number				1	2	1
Depth (m)				0.15	0.80	0.20
Date Sampled				15/09/2022	15/09/2022	15/09/2022
Time Taken				None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**			
Stone Content	%	0.1	NONE	< 0.1	< 0.1	18
Moisture Content	%	0.01	NONE	8.8	6.9	7.2
Total mass of sample received	kg	0.001	NONE	0.9	0.9	0.9
Asbestos in Soil	Type	N/A	ISO 17025	-	-	-
Asbestos Analyst ID	N/A	N/A	N/A	N/A	N/A	N/A
General Inorganics						
pH - Automated	pH Units	N/A	MCERTS	7.7	8.6	6.8
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
Complex Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
Free Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.0087	0.0038	0.011
Total Sulphur	mg/kg	50	MCERTS	570	440	340
Organic Matter (automated)	%	0.1	MCERTS	4	0.3	2.7
Total Phenols						
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
Speciated PAHs						
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05
Pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05
Total PAH						
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	< 0.80	< 0.80
Heavy Metals / Metalloids						
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	20	15	15
Barium (aqua regia extractable)	mg/kg	1	MCERTS	72	15	89
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	1.2	0.44	1.4
Boron (water soluble)	mg/kg	0.2	MCERTS	1	0.4	1.8
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	1
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	29	7.4	33
Copper (aqua regia extractable)	mg/kg	1	MCERTS	45	58	200
Lead (aqua regia extractable)	mg/kg	1	MCERTS	38	27	99
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	28	16	36

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Analytical Report Number: 22-86042
Project / Site name: Oxfordshire
Your Order No: PO 2989

Lab Sample Number				2435590	2435591	2435592
Sample Reference				TP187	TP187	TP189
Sample Number				1	2	1
Depth (m)				0.15	0.80	0.20
Date Sampled				15/09/2022	15/09/2022	15/09/2022
Time Taken				None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**			
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	50	16	52
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	240	290	1200

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Your Order No: PO 2989

Lab Sample Number				2435590	2435591	2435592
Sample Reference				TP187	TP187	TP189
Sample Number				1	2	1
Depth (m)				0.15	0.80	0.20
Date Sampled				15/09/2022	15/09/2022	15/09/2022
Time Taken				None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**			
Monoaromatics & Oxygenates						
Benzene	µg/kg	1	MCERTS	-	< 1.0	-
Toluene	µg/kg	1	MCERTS	-	< 1.0	-
Ethylbenzene	µg/kg	1	MCERTS	-	< 1.0	-
p & m-xylene	µg/kg	1	MCERTS	-	< 1.0	-
o-xylene	µg/kg	1	MCERTS	-	< 1.0	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	< 1.0	-
Petroleum Hydrocarbons						
TPH C10 - C40 EH_CU_1D_TOTAL	mg/kg	10	MCERTS	< 10	< 10	< 10
TPH2 (C6 - C10) HS_1D_TOTAL	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1
TPH-CWG - Aliphatic >EC5 - EC6 HS_1D_AL	mg/kg	0.001	MCERTS	-	< 0.001	-
TPH-CWG - Aliphatic >EC6 - EC8 HS_1D_AL	mg/kg	0.001	MCERTS	-	< 0.001	-
TPH-CWG - Aliphatic >EC8 - EC10 HS_1D_AL	mg/kg	0.001	MCERTS	-	< 0.001	-
TPH-CWG - Aliphatic >EC10 - EC12 EH_CU_1D_AL	mg/kg	1	MCERTS	-	< 1.0	-
TPH-CWG - Aliphatic >EC12 - EC16 EH_CU_1D_AL	mg/kg	2	MCERTS	-	< 2.0	-
TPH-CWG - Aliphatic >EC16 - EC21 EH_CU_1D_AL	mg/kg	8	MCERTS	-	< 8.0	-
TPH-CWG - Aliphatic >EC21 - EC35 EH_CU_1D_AL	mg/kg	8	MCERTS	-	< 8.0	-
TPH-CWG - Aliphatic (EC5 - EC35) EH_CU+HS_1D_AL	mg/kg	10	MCERTS	-	< 10	-
TPH-CWG - Aromatic >EC5 - EC7 HS_1D_AR	mg/kg	0.001	MCERTS	-	< 0.001	-
TPH-CWG - Aromatic >EC7 - EC8 HS_1D_AR	mg/kg	0.001	MCERTS	-	< 0.001	-
TPH-CWG - Aromatic >EC8 - EC10 HS_1D_AR	mg/kg	0.001	MCERTS	-	< 0.001	-
TPH-CWG - Aromatic >EC10 - EC12 EH_CU_1D_AR	mg/kg	1	MCERTS	-	< 1.0	-
TPH-CWG - Aromatic >EC12 - EC16 EH_CU_1D_AR	mg/kg	2	MCERTS	-	< 2.0	-
TPH-CWG - Aromatic >EC16 - EC21 EH_CU_1D_AR	mg/kg	10	MCERTS	-	< 10	-
TPH-CWG - Aromatic >EC21 - EC35 EH_CU_1D_AR	mg/kg	10	MCERTS	-	< 10	-
TPH-CWG - Aromatic (EC5 - EC35) EH_CU+HS_1D_AR	mg/kg	10	MCERTS	-	< 10	-
Pesticide and Herbicide Screen						
GCMS Pesticide Screen		N/A	NONE	-	-	None Detected
Herbicides						
Aldicarb	µg/kg	10	NONE	-	-	< 10
Aldicarb Sulfone	µg/kg	10	NONE	-	-	< 10
Aldicarb Sulfoxide	µg/kg	50	NONE	-	-	< 50
Atrazine	µg/kg	10	NONE	-	-	< 10
Carbaryl	µg/kg	10	NONE	-	-	< 10
Carbofuran	µg/kg	10	NONE	-	-	< 10
Carbofuran, 3-OH	µg/kg	20	NONE	-	-	< 20
Chlortoluron	µg/kg	10	NONE	-	-	< 10
Cyanazine	µg/kg	10	NONE	-	-	< 10
Diflubenzuron	µg/kg	50	NONE	-	-	< 50
Diuron	µg/kg	10	NONE	-	-	< 10
Fluometuron	µg/kg	10	NONE	-	-	< 10
Isoproturon	µg/kg	10	NONE	-	-	< 10
Linuron	µg/kg	20	NONE	-	-	< 20
Methiocarb	µg/kg	10	NONE	-	-	< 10
Methomyl	µg/kg	10	NONE	-	-	< 10
Oxamyl	µg/kg	10	NONE	-	-	< 10

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Analytical Report Number: 22-86042
Project / Site name: Oxfordshire
Your Order No: PO 2989

Lab Sample Number				2435590	2435591	2435592
Sample Reference				TP187	TP187	TP189
Sample Number				1	2	1
Depth (m)				0.15	0.80	0.20
Date Sampled				15/09/2022	15/09/2022	15/09/2022
Time Taken				None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**			
Prometryn	µg/kg	10	NONE	-	-	< 10
Propazine	µg/kg	10	NONE	-	-	< 10
Propoxur	µg/kg	10	NONE	-	-	< 10
Siduron	µg/kg	10	NONE	-	-	< 10
Simazine	µg/kg	10	NONE	-	-	< 10
Tebuthiuron	µg/kg	10	NONE	-	-	< 10
Terbuthylazine	µg/kg	10	NONE	-	-	< 10
Terbutryn	µg/kg	10	NONE	-	-	< 10
Thiadiazuron	µg/kg	10	NONE	-	-	< 10
Trietazine	µg/kg	10	NONE	-	-	< 10

U/S = Unsuitable Sample I/S = Insufficient Sample

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Analytical Report Number: 22-86042
Project / Site name: Oxfordshire

Your Order No: PO 2989

Lab Sample Number				2435593	2435594	2435595	2435596	2435597
Sample Reference				TP167	TP173	TP176	TP180	TP183
Sample Number				2	2	2	2	2
Depth (m)				0.50	0.70	0.80	0.60	0.45
Date Sampled				15/09/2022	15/09/2022	15/09/2022	15/09/2022	15/09/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Leachate Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
General Inorganics								
pH (automated)	pH Units	N/A	ISO 17025	8.0	8.1	8.1	8.3	8.3
Total Cyanide	µg/l	10	ISO 17025	< 10	< 10	< 10	< 10	< 10
Sulphate as SO_4	mg/l	0.1	ISO 17025	3.3	2.6	2.9	2.7	5.3
Heavy Metals / Metalloids								
Arsenic (dissolved)	µg/l	1	ISO 17025	< 1.0	< 1.0	1.3	< 1.0	< 1.0
Barium (dissolved)	µg/l	0.05	ISO 17025	10	9.1	11	11	9.1
Beryllium (dissolved)	µg/l	0.2	ISO 17025	0.3	0.2	0.3	0.3	0.3
Boron (dissolved)	µg/l	10	ISO 17025	44	19	21	17	39
Cadmium (dissolved)	µg/l	0.08	ISO 17025	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08
Chromium (dissolved)	µg/l	0.4	ISO 17025	1.2	1	1.4	1.6	1.6
Copper (dissolved)	µg/l	0.7	ISO 17025	11	9.2	9.6	9.7	13
Lead (dissolved)	µg/l	1	ISO 17025	3.4	4.5	4.4	3	4.7
Mercury (dissolved)	µg/l	0.5	ISO 17025	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Nickel (dissolved)	µg/l	0.3	ISO 17025	4.4	5.3	3.8	5.3	5.3
Selenium (dissolved)	µg/l	4	ISO 17025	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Vanadium (dissolved)	µg/l	1.7	ISO 17025	< 1.7	5.1	3.5	3.6	8
Zinc (dissolved)	µg/l	0.4	ISO 17025	12	8.2	8.3	6.7	13

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Analytical Report Number: 22-86042
Project / Site name: Oxfordshire

Your Order No: PO 2989

Lab Sample Number				2435598	2435599
Sample Reference				TP185	TP187
Sample Number				2	2
Depth (m)				0.30	0.80
Date Sampled				15/09/2022	15/09/2022
Time Taken				None Supplied	None Supplied
Analytical Parameter (Leachate Analysis)	**Units**	**Limit of detection**	**Accreditation Status**		
General Inorganics					
pH (automated)	pH Units	N/A	ISO 17025	8.1	8.3
Total Cyanide	µg/l	10	ISO 17025	< 10	< 10
Sulphate as SO_4	mg/l	0.1	ISO 17025	9.8	2.9
Heavy Metals / Metalloids					
Arsenic (dissolved)	µg/l	1	ISO 17025	< 1.0	< 1.0
Barium (dissolved)	µg/l	0.05	ISO 17025	9.3	7
Beryllium (dissolved)	µg/l	0.2	ISO 17025	0.3	0.3
Boron (dissolved)	µg/l	10	ISO 17025	24	17
Cadmium (dissolved)	µg/l	0.08	ISO 17025	< 0.08	< 0.08
Chromium (dissolved)	µg/l	0.4	ISO 17025	1.1	0.7
Copper (dissolved)	µg/l	0.7	ISO 17025	5	4.3
Lead (dissolved)	µg/l	1	ISO 17025	4.9	4.7
Mercury (dissolved)	µg/l	0.5	ISO 17025	< 0.5	< 0.5
Nickel (dissolved)	µg/l	0.3	ISO 17025	5.5	4.1
Selenium (dissolved)	µg/l	4	ISO 17025	< 4.0	< 4.0
Vanadium (dissolved)	µg/l	1.7	ISO 17025	2.7	2.2
Zinc (dissolved)	µg/l	0.4	ISO 17025	9.9	4.8

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Analytical Report Number : 22-86042
Project / Site name: Oxfordshire

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
2435575	TP161	1	0.1	Brown loam and clay with vegetation and gravel
2435576	TP165	1	0.1	Brown loam and clay with vegetation and gravel
2435577	TP167	1	0.1	Brown loam and clay with vegetation and gravel
2435578	TP167	2	0.5	Brown clay with vegetation and gravel
2435579	TP169	2	0.41	Light brown clay with gravel.
2435580	TP170	1	0.05	Brown loam and clay with vegetation and gravel
2435581	TP173	2	0.7	Light brown clay with gravel and vegetation.
2435582	TP176	1	0.15	Brown loam and clay with vegetation and gravel
2435583	TP176	2	0.8	Light brown clay with gravel.
2435584	TP180	1	0.1	Brown loam and clay with vegetation and stones.
2435585	TP180	2	0.6	Light brown clay with vegetation and gravel
2435586	TP181	1	0.1	Brown loam and clay with vegetation and gravel
2435588	TP183	2	0.45	Brown clay with stones and chalk.
2435589	TP185	2	0.3	Light brown clay with gravel and chalk.
2435590	TP187	1	0.15	Brown loam and clay with vegetation and gravel
2435591	TP187	2	0.8	Light brown clay.
2435592	TP189	1	0.2	Brown loam and clay with stones and vegetation.

Analytical Report Number : 22-86042
Project / Site name: Oxfordshire

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
BS EN 12457-1 (2:1) Leachate Prep	2:1 (as recieved, moisture adjusted) end over end extraction with water for 24 hours. Eluate filtered prior to analysis.	In-house method based on BSEN12457-1.	L043-PL	W	NONE
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with dispersion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Metals by ICP-OES in leachate	Determination of metals in leachate by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Boron in leachate	Determination of boron in leachate. Sample acidified and followed by ICP-OES.	In-house method based on MEWAM	L039-PL	W	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
Complex Cyanide in soil	Determination of complex cyanide by calculation.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Free cyanide in soil	Determination of free cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
pH at 20oC in leachate (automated)	Determination of pH in leachate by electrometric measurement.	In house method.	L099B	W	ISO 17025
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
TPH2 (Soil)	Determination of hydrocarbons C6-C10 by headspace GC-MS.	In-house method based on USEPA8260	L088-PL	W	MCERTS

Analytical Report Number : 22-86042
Project / Site name: Oxfordshire

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Total cyanide in leachate	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	ISO 17025
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L088/76-PL	W	MCERTS
Herbicides by LC-MS	Detemination of Herbicides in soil by LC MS	In-house method	L056B-PL	W	NONE
GC Pesticide Screen (TIC)	Analysis of unknown pesticides by GCMS	GC Pesticide Screen (TIC)	L064B	D	NONE
TPH Banding in Soil by FID	Determination of hexane extractable hydrocarbons in soil by GC-FID.	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	MCERTS
Sulphate in leachates	Determination of sulphate in leachate by acidification followed by ICP-OES.	In-house method based on MEWAM 1986 Methods for the Determination of Metals in Soil""	L039-PL	W	ISO 17025
Organic matter (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L009-PL	D	MCERTS
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in NaOH and addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Information in Support of Analytical Results

List of HWOL Acronyms and Operators

Acronym	Descriptions
HS	Headspace Analysis
MS	Mass spectrometry
FID	Flame Ionisation Detector
GC	Gas Chromatography
EH	Extractable Hydrocarbons (i.e. everything extracted by the solvent(s))
CU	Clean-up - e.g. by Florisil®, silica gel
1D	GC - Single coil/column gas chromatography
2D	GC-GC - Double coil/column gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics
AR	Aromatics

Analytical Report Number : 22-86042
Project / Site name: Oxfordshire

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
#1	EH_2D_Total but with humics mathematically subtracted				
#2	EH_2D_Total but with fatty acids mathematically subtracted				
_	Operator - understore to separate acronyms (exception for +)				
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total				

Sample Deviation Report

Analytical Report Number : 22-86042
Project / Site name: Oxfordshire

This deviation report indicates the sample and test deviations that apply to the samples submitted for analysis.Please note that the associated result(s) may be unreliable and should be interpreted with care.

Sample ID	Other ID	Sample Type	Lab Sample Number	Sample Deviation	Test Name	Test Ref	Test Deviation
TP161	1	S	2435575	c	Free cyanide in soil	L080-PL	c
TP161	1	S	2435575	c	Complex Cyanide in soil	L080-PL	c
TP161	1	S	2435575	c	Total cyanide in soil	L080-PL	c
TP165	1	S	2435576	c	Free cyanide in soil	L080-PL	c
TP165	1	S	2435576	c	Complex Cyanide in soil	L080-PL	c
TP165	1	S	2435576	c	Total cyanide in soil	L080-PL	c
TP167	1	S	2435577	c	Free cyanide in soil	L080-PL	c
TP167	1	S	2435577	c	Complex Cyanide in soil	L080-PL	c
TP167	1	S	2435577	c	Total cyanide in soil	L080-PL	c
TP167	2	S	2435578	c	Free cyanide in soil	L080-PL	c
TP167	2	S	2435578	c	Complex Cyanide in soil	L080-PL	c
TP167	2	S	2435578	c	Total cyanide in soil	L080-PL	c
TP169	2	S	2435579	c	Free cyanide in soil	L080-PL	c
TP169	2	S	2435579	c	Complex Cyanide in soil	L080-PL	c
TP169	2	S	2435579	c	Total cyanide in soil	L080-PL	c
TP170	1	S	2435580	c	Free cyanide in soil	L080-PL	c
TP170	1	S	2435580	c	Complex Cyanide in soil	L080-PL	c
TP170	1	S	2435580	c	Total cyanide in soil	L080-PL	c
TP173	2	S	2435581	c	Free cyanide in soil	L080-PL	c
TP173	2	S	2435581	c	Complex Cyanide in soil	L080-PL	c
TP173	2	S	2435581	c	Total cyanide in soil	L080-PL	c
TP176	1	S	2435582	c	Free cyanide in soil	L080-PL	c
TP176	1	S	2435582	c	Complex Cyanide in soil	L080-PL	c
TP176	1	S	2435582	c	Total cyanide in soil	L080-PL	c
TP176	2	S	2435583	c	Free cyanide in soil	L080-PL	c
TP176	2	S	2435583	c	Complex Cyanide in soil	L080-PL	c
TP176	2	S	2435583	c	Total cyanide in soil	L080-PL	c
TP180	1	S	2435584	c	Free cyanide in soil	L080-PL	c
TP180	1	S	2435584	c	Complex Cyanide in soil	L080-PL	c
TP180	1	S	2435584	c	Total cyanide in soil	L080-PL	c
TP180	2	S	2435585	c	Free cyanide in soil	L080-PL	c
TP180	2	S	2435585	c	Complex Cyanide in soil	L080-PL	c
TP180	2	S	2435585	c	Total cyanide in soil	L080-PL	c
TP181	1	S	2435586	c	Free cyanide in soil	L080-PL	c
TP181	1	S	2435586	c	Complex Cyanide in soil	L080-PL	c
TP181	1	S	2435586	c	Total cyanide in soil	L080-PL	c
TP183	2	S	2435588	c	Free cyanide in soil	L080-PL	c
TP183	2	S	2435588	c	Complex Cyanide in soil	L080-PL	c
TP183	2	S	2435588	c	Total cyanide in soil	L080-PL	c
TP185	2	S	2435589	c	Free cyanide in soil	L080-PL	c
TP185	2	S	2435589	c	Complex Cyanide in soil	L080-PL	c
TP185	2	S	2435589	c	Total cyanide in soil	L080-PL	c
TP187	1	S	2435590	c	Free cyanide in soil	L080-PL	c
TP187	1	S	2435590	c	Complex Cyanide in soil	L080-PL	c
TP187	1	S	2435590	c	Total cyanide in soil	L080-PL	c
TP187	2	S	2435591	c	Free cyanide in soil	L080-PL	c
TP187	2	S	2435591	c	Complex Cyanide in soil	L080-PL	c
TP187	2	S	2435591	c	Total cyanide in soil	L080-PL	c
TP189	1	S	2435592	c	Free cyanide in soil	L080-PL	c
TP189	1	S	2435592	c	Complex Cyanide in soil	L080-PL	c
TP189	1	S	2435592	c	Total cyanide in soil	L080-PL	c

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Analytical Report Number : 22-87268

Project / Site name:	Oxforshire	**Samples received on:**	29/09/2022
Your job number:	C10172	**Samples instructed on/ Analysis started on:**	29/09/2022
Your order number:	PO-2991	**Analysis completed by:**	06/10/2022
Report Issue Number:	1	**Report issued on:**	06/10/2022
Samples Analysed:	7 soil samples		

Signed [redacted]

[redacted]
Junior Reporting Specialist
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

Excel copies of reports are only valid when accompanied by this PDF certificate.

Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 22-87268
Project / Site name: Oxforshire
Your Order No: PO-2991

Lab Sample Number				2443322	2443323	2443324	2443325	2443326
Sample Reference				TP166	TP170	TP176	TP179	TP181
Sample Number				2	2	2	2	2
Depth (m)				0.40	0.35	0.25	0.40	0.30
Date Sampled				13/09/2022	15/09/2022	12/09/2022	15/09/2022	13/09/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	90	< 0.1	99	< 0.1
Moisture Content	%	0.01	NONE	5.1	7.1	9.5	4.3	8.5
Total mass of sample received	kg	0.001	NONE	0.8	0.8	0.8	0.8	0.8

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8.6	8.6	8	8.3	7.6
Total Sulphate as SO4	%	0.005	MCERTS	0.08	0.068	0.066	0.059	0.052
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.0027	0.0037	0.0059	0.0027	0.0034
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	2.7	3.7	5.9	2.7	3.4
Total Sulphur	%	0.005	MCERTS	0.036	0.035	0.051	0.031	0.041

U/S = Unsuitable Sample I/S = Insufficient Sample

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The results included within the report relate only to the sample(s) submitted for testing.

Analytical Report Number: 22-87268
Project / Site name: Oxforshire
Your Order No: PO-2991

Lab Sample Number				2443327	2443328
Sample Reference				TP183	TP185
Sample Number				2	2
Depth (m)				0.70	0.50
Date Sampled				14/09/2022	14/09/2022
Time Taken				None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**		
Stone Content	%	0.1	NONE	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	4.1	6.8
Total mass of sample received	kg	0.001	NONE	0.8	0.8

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8.4	8.6
Total Sulphate as SO4	%	0.005	MCERTS	0.054	0.09
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.0043	0.0064
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	4.3	6.4
Total Sulphur	%	0.005	MCERTS	0.025	0.037

U/S = Unsuitable Sample I/S = Insufficient Sample

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The results included within the report relate only to the sample(s) submitted for testing.

Analytical Report Number : 22-87268
Project / Site name: Oxforshire

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
2443322	TP166	2	0.4	Beige clay and sand with chalk and vegetation.
2443323	TP170	2	0.35	Brown clay and sand with concrete and stones.
2443324	TP176	2	0.25	Brown loam and clay with gravel and vegetation.
2443325	TP179	2	0.4	Brown clay and loam with gravel and stones.
2443326	TP181	2	0.3	Brown clay and loam with gravel and vegetation.
2443327	TP183	2	0.7	Brown clay and sand with chalk and vegetation.
2443328	TP185	2	0.5	Brown sandy clay with gravel.

Analytical Report Number : 22-87268
Project / Site name: Oxforshire

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Total Sulphate in soil as %	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
Total Sulphur in soil as %	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
Sulphate, water soluble, in soil	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

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Appendix 3 : Detailed UXO Risk Assessment

1ST LINE DEFENCE



Detailed Unexploded Ordnance (UXO) Risk Assessment

Project Name	RAF Heyford, Oxfordshire
Client	BWB Consulting Limited
Site Address	RAF Upper Heyford, Oxfordshire
Report Reference	DA13850-00
Date	24th August 2021
Originator	LG

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Executive Summary

Site Location and Description

The site is located approximately 4km west to 7.5km north-west of Bicester town centre and approximately 17.5km north of Oxford city centre. The villages of Ardley and Fewcott are located between the northern and western sections of the site, whilst the village of Middleton Stoney is located to the south-west of the site.

The site is bound to the north, east and south by large areas of areas of undeveloped agricultural land, farm access tracks, as well as several minor and some major roadways, including *Ardley Road*, *B4100*, B430, *A43*, *M4*0, to the west by the runway and structures of the former RAF/USAF Upper Heyford aerodrome, areas of agricultural land, woodland, several roadways including *Camp Road*, *Chilgrove Drive*, *Somerton Road*, and a section of the *Chiltern Railway line*.

The site is approximately centred on the OS grid reference: **SP 53884 26661**.

Proposed Works

Information provided by BWB Consulting Limited indicates that the nature of the proposed works will include the construction of a rail freight interchange and large distribution facilities which will include extensive earthworks, building sheds and new roads. Ground investigation work will include 120 exploratory holes across the site, consisting of trial pits, shallow dynamic samples holes and deeper rotary boreholes.

Geology and Bomb Penetration Depth

The British Geological Survey (BGS) map shows the site to be predominantly underlain by White Limestone Formation - Limestone, with no recorded superficial deposits. The site is also interspersed with smaller areas of Rutland Formation – Mudstone, with superficial deposits of Head - Clay, Silt, Sand and Gravel in the north-west section of the site, and areas of Forest Marble Formation – Limestone, with superficial deposits of Alluvium - Clay, Silt, Sand and Gravel throughout the southern and western sections of the site. The entire site area is underlain by Sedimentary Bedrock formed during the Jurassic Period.

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 the risk from items of UXO is not considered to be homogenous across the site. There is an assessed **Medium Risk** from items of German aerial delivered UXO, items of anti-aircraft UXO and items of Allied UXO within the north-western section of the site. Whereas there is an assessed **Low Risk** from items of German aerial delivered UXO, items of anti-aircraft UXO and items of Allied UXO across the remainder of the site. A risk map is presented in **Annex P**.

German Risk:

- During WWII the site was located within the Rural District of Ploughly, which was subject to an overall very low density of bombing according to Home Office bombing statistics, with an average of 3.5 items of ordnance per 1,000 acres. This was mainly due to the lack of strategic bombing targets and the large areas of agricultural land that predominantly occupied much of the rural districts.
- As the site comprised agricultural land during WWII, there is no particular reason to suspect that the site area itself would have been targeted or directly attacked. However, the presence of strategic targets in the surrounding vicinity; notably RAF Upper Heyford airfield immediately adjacent to the west of the site, RAF Weston-on-the-Green which was located approximately 2.5km south, RAF Croughton located approximately 2.5km north and RAF Bicester, located approximately 4.3km south-east of the site. These are known to have been subject to specific bombing raids, and their relative proximity is anticipated to cause a slight elevation of the bomb density across the site area in general. More than 62 HE bomb strikes are recorded to have fallen in the vicinity of Weston-on-the-Green parish to

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UXO Risk Assessment

the south of the site, 29 within the parish of Upper Heyford parish immediately to the west, 17 in Fritwell parish to the north-west, one HE bomb strike and several Incendiary bombs within Stoke Lyne parish.

- **Annex L** provides an overlay of bomb strikes with specified and approximate locations derived from local ARP Logbook records obtained from Oxfordshire History Centre and a bomb map obtained from Oxfordshire County Council. Although it should be noted that this map does not provide a comprehensive account of the bombing on site, nor does it denote exact bomb strike locations.
- It is evident that the closest bombing target would have been RAF Upper Heyford – various sources confirm that the airfield was attacked on several occasions, with bombs falling both on and close to the station. No bomb census mapping was available for the area, so it not clear exactly where all of the recorded bombs fell on and around the site. However, it might be argued that the risk of UXB contamination is elevated the closer the proximity to the airfield boundaries.
- Due to the size and largely rural nature of the site, it has not been possible to assess signs of damage across the entire area in detail. Although on the basis of OS mapping structures in the area surrounding the site appear intact post-war.
- As much of the site was occupied by open rural land, it is considered possible that UXBs could have gone undetected, as bomb entry holes may have been obscured or overlooked in vegetated areas or areas under crop. The entry hole for a 50kg UXB can be as small as 20cm in diameter. As such, the possibility that an item of UXO fell on site unnoticed and unrecorded cannot be confidently discounted. Equally, overall, it is not considered likely that any one area of the site would have been frequently accessed or specifically checked for evidence of German air-delivered ordnance, given its open, agricultural nature. It is therefore conceivable that UXBs could have gone unnoticed if they fell within the site boundary.
- In summary, given the various targets in the wider area, and the presence of RAF Upper Heyford to the west of the site, it has not been possible to entirely discount the risk of contamination from German aerial delivered ordnance within the bounds of the site. However, for the most part, the risk of contamination is not considered significantly elevated above the general 'background' level of risk for similar agricultural fields in the wider area. It has however been determined that the risk of contamination is likely to increase with closer proximity to the former airfield, which is known to have been attacked on a number of occasions. Although the site was not within the bounds of the airfield, the risk of contamination in the fields which immediately adjoin the airfield is assessed as elevated as a precaution. A risk map demonstrating this is presented in **Annex P1**.

Allied Risk:

- During WWII RAF Upper Heyford was used as an Operational Training Unit for Bomber Command which were involved in a number of bombing sorties over Germany. As such, bombs, fuses and ordnance of various types will have been stored within the bounds of the airfield in a dedicated bomb store area. This bomb store area has been identified on RAF site plans from 1942, presented within **Annex F1** and was located approximately 800m west of the site.
- After RAF Upper Heyford was leased to the USAF in 1950, the airfield underwent significant development and expansion. This included the construction of two additional bomb store areas; the northern bomb store and southern bomb store, presented on RAF site plans from 1994 within **Annex O**. The western section of the site was located approximately 180m from the northern bomb store area and immediately adjacent to the southern bomb store area.
- Information regarding the use of the bomb stores varies between sources, although as the airfield housed squadrons of Strategic Air Command (SAC) squadrons throughout the 1950's and 1960's, it is likely that one or both of these bomb stores were used to store nuclear weapons during this period, as well as a variety of conventional munitions throughout the USAF's tenure of the airfield.
- A geo-dataset held in-house indicated that the Middleton Stoney Camp was located approximately 250m – 1.2km west of the southern-most section of the site. Middleton Stoney and the surrounding area is known to have been occupied by the Lancashire Fusiliers, housing searchlight batteries and machine guns. The camp is also said to have been used to store equipment for Upper Heyford, included a firing range, stationed US Army troops prior to the D-Day landings and was used as a US military hospital.
- A press article from April 2019 reports that two 'unexploded bombs' were removed from Camp Road – within former RAF Heyford, to the west of the site. It is thought possible they these were practice bombs – possibly of the small 10/11lb variety. This would not be unexpected given the history of the airfield. Such items would usually be 'targeted' at a specific location within the bounds of an airfield. However, it was not unheard of for practice bombing to overshoot and affect the land surrounding an historic airfield.

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UXO Risk Assessment

- Consulted record sets indicates that no LAA or HAA batteries are known to have been located within or bordering the bounds of the site; the closest recorded was an LAA battery situated approximately 350m west of the site. Although it is possible that mobile LAA batteries could have come to be temporarily located within the site.
- No specific evidence of training or firing ranges could be found within the site area, although anecdotal evidence indicates the presence of a firing range within the vicinity of Brown's at Park Farm, located approximately 1.1km west of the southern section of the site.
- In summary, whilst the site was located outside the demarcated bounds of the Upper Heyford airfield, and these allied features were not located directly within the bounds of the site, as a precaution, the fields immediately adjoining the airfield have been ascribed a higher level of risk than those further away. It is not unheard of for contamination to have occurred both within and immediately adjacent to airfield perimeters – through burial, burning, improper disposal, exercises etc. As with bombing risk, the risk of contamination from Allied items of ordnance is considered to 'drop-off' with distance from the airfield, and is considered to be 'Low' for the majority of the site (see Risk Map, **Annex P2**.

Post-war development:

- OS mapping indicates that the site area has been subject to very limited development in the post-war era. The site largely retains its open and undeveloped agricultural outlay. The only discernible development took place within the northern and eastern sections of the site during the late-1960's and early 1970's, in which a segment of the M40 motorway and associated slip roads were constructed.
- 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 RAF Heyford, Oxfordshire – see Risk Map, **Annex P**:

All Works

- UXO Risk Management Plan
- Site Specific UXO Awareness Briefings to all personnel conducting intrusive works.

Medium Risk Areas

Open Intrusive Works (trial pits, service pits, open excavations, shallow foundations etc.)

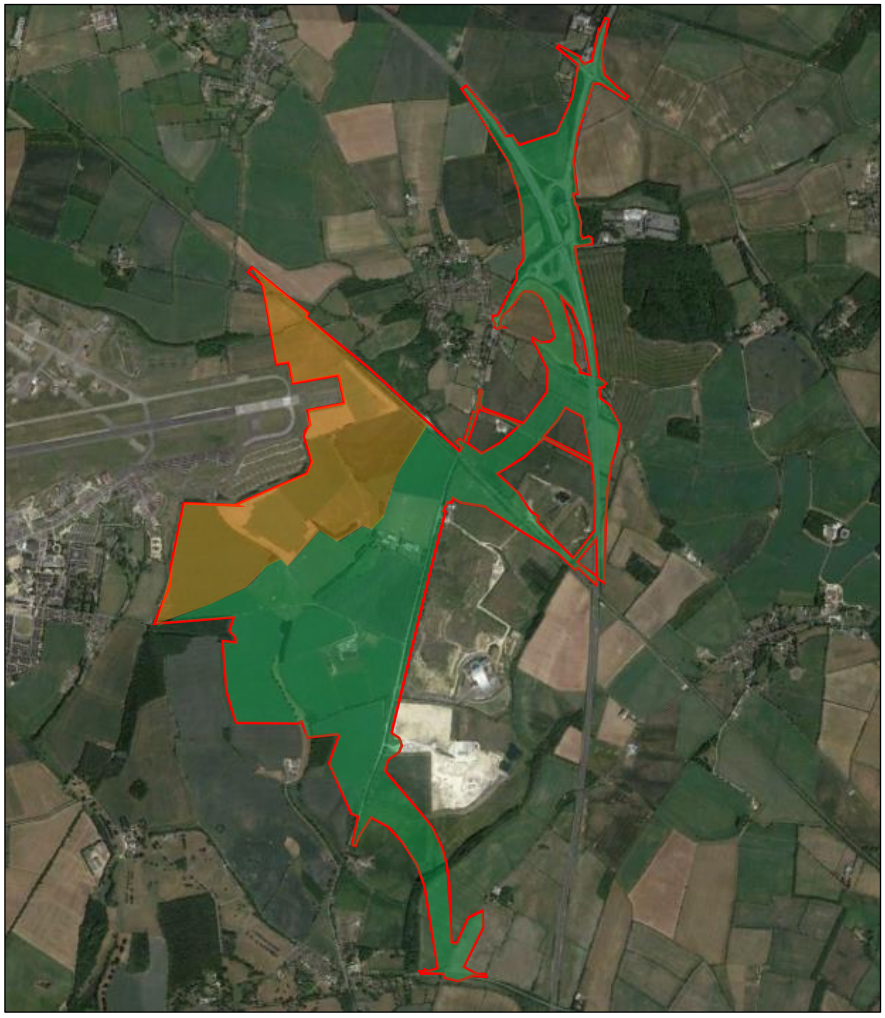
- Non-intrusive UXO Magnetometer Survey. If this is not viable/appropriate:
- UXO Specialist On-site Support

Boreholes and Piled Foundations

- Intrusive Magnetometer Survey of all borehole and pile locations/clusters down to maximum bomb penetration depth.

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German UXO and Allied UXO Risk Map



For indicative purposes – not to scale.
Please note that this assessed risk map may not take into account all post-war redevelopment/excavations on site.

Low Risk

Medium Risk

<u>1st Line Defence Risk Mitigation Services:</u>

All Areas of the Site:

- Site Specific Unexploded Ordnance Awareness Briefings – a service recommended to all personnel conducting intrusive works.
- UXO Risk Management Plan

Medium Risk Areas of the site:

- Non-Intrusive UXO Magnetometer Survey and Target Investigation (where appropriate.)
- Unexploded Ordnance Specialist - a service to support open intrusive works.
- Intrusive Magnetometer Survey – a service to support any borehole or pile locations/clusters down to an assessed maximum bomb penetration depth.

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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
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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Contents

Executive Summary ..... **II**

Glossary ..... **VI**

Contents ..... **VII**

Annexes ..... **X**

Appendices ..... **X**

1. Introduction **0**

1.1. Background *0*

2. Method Statement **1**

2.1. Report Objectives *1*

2.2. Risk Assessment Process *1*

2.3. Sources of Information *1*

3. Background to Bombing Records **2**

3.1. General Considerations of Historical Research *2*

3.2. German Bombing Records *2*

3.3. Allied Records *2*

4. UK Regulatory Environment and Guidelines **3**

4.1. General *3*

4.2. CDM Regulations 2015 ..... *3*

4.3. The 1974 Health and Safety at Work etc. Act *3*

4.4. CIRIA C681 ..... *4*

4.5. Additional Legislation *4*

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

5.1. Commercial UXO Specialists *5*

5.2. The Authorities *5*

6. The Site **6**

6.1. Site Location *6*

6.2. Site Description *6*

7. Scope of the Proposed Works **6**

7.1. General *6*

8. Ground Conditions **7**

8.1. General Geology *7*

8.2. Site Specific Geology *7*

9. Site History **8**

9.1. Introduction *8*

9.2. Summary of the Historical Background of the Site *8*

9.3. Ordnance Survey Historical Maps *8*

9.4. WWII-era RAF Site Plans *9*

10. Introduction to German Aerial Delivered Ordnance **10**

10.1. General *10*

10.2. Generic Types of WWII German Aerial Delivered Ordnance *10*

10.3. Failure Rate of German Aerial Delivered Ordnance *11*

10.4. UXB Ground Penetration *11*

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10.4.1. The J-Curve Effect Principle 11
10.4.2. WWII UXB Ground Penetration Studies 11
10.4.3. Site Specific Bomb Penetration Considerations 12
10.5. V-Weapons 12
11. The Likelihood of Contamination from German Aerial Delivered UXBs 13
11.1. World War I 13
11.2. World War II Bombing of the Rural District of Ploughly 13
11.3. WWII Home Office Bombing Statistics 14
11.4. Oxfordshire Bomb Map 15
11.5. Oxfordshire ARP Logbook 16
11.6. Online/Anecdotal References to the Bombing of RAF Upper Heyford 18
11.7. Published Literature Referring to the Bombing of RAF Upper Heyford 19
11.8. Post-WWII Era Aerial Photography 20
11.9. Introduction to WWII-era Bombing Decoy Sites 21
11.10. Abandoned Bombs 22
11.11. Bomb Disposal Tasks 22
11.12. Evaluation of German Aerial Delivered UXO Records 23
12. Introduction to Allied Ordnance 25
12.1. General 25
12.2. Nuclear Weaponry 25
12.3. Land Service Ammunition 25
12.4. Small Arms Ammunition 25
12.5. Defending the UK From Aerial Attack 26
12.5.1. Anti-Aircraft Artillery (AAA) 26
13. The Likelihood of Contamination from Allied Ordnance 28
13.1. Introduction 28
13.2. Military History of the Site of Proposed Works 29
13.2.1. WWI-era 29
13.2.2. Interwar Period 29
13.2.3. WWII-era 29
13.2.4. Post-WWI era 30
13.3. Online/Anecdotal References to the Allied/Military Activity Within the Site Locality 31
13.4. Evaluation of Contamination Risk from Allied UXO 32
14. The Likelihood of UXO Contamination Summary 34
15. The Likelihood that UXO Remains 37
15.1. Introduction 37
15.2. UXO Clearance 37
15.3. Post-War Redevelopment 37
16. The Likelihood of UXO Encounter 38
16.1. Introduction 38
16.2. Encountering Aerial Delivered Ordnance 38
16.3. Land Service/Small Arms Ammunition Encounter 38
17. The Likelihood of UXO Initiation 39
17.1. Introduction 39
17.2. Initiating Aerial Delivered Ordnance 39

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17.3. Land Service /Small Arms Ammunition Initiation 40
18. Consequences of Initiation/Encounter 41
18.1. Introduction 41
18.2. Consequences of Detonation 41
19. 1st Line Defence Risk Assessment 42
19.1. Risk Assessment Stages 42
19.2. Assessed Risk Level Within Western Section of the Site 42
19.3. Assessed Risk Level Within Remainder of the Site 43
20. Proposed Risk Mitigation Methodology 44
20.1. General 44
Bibliography 46

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Annexes

List of Report Annexes	
Annex A	Site Location Maps
Annex B	Recent Aerial Photography
Annex C	Client Provided Site Plan
Annex D	Site History
Annex E	Pre and Post-WWII Historical Maps
Annex F	WWII-era RAF Site Plans
Annex G	Example of UXO Entry Hole / The 'J-curve' Effect Principle
Annex H	Examples of UXO Incidents
Annex I	WWI Map of Air Raids and Naval Bombardments
Annex J	Oxfordshire Bomb Map
Annex K	Vision of Britain Map – Oxfordshire Bomb Map Overlay
Annex L	Oxfordshire History Centre ARP Logbook
Annex M	Post-WWII era RAF Aerial Photography 16th April 1947
Annex N	Post-WWII era RAF Aerial Photography 31st August 1954
Annex O	Post-WWII era Site Plans 1994
Annex P	Risk Mapping of the Site Area

Appendices

List of Report Appendices	
Appendix i-iii	Examples of German Air-Delivered Ordnance
Appendix iv-vi	Examples of Land Service Ammunition
Appendix vii	Examples of Small Arms Ammunition
Appendix viii	Examples of Anti-Aircraft Projectiles

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Detailed Unexploded Ordnance (UXO) Risk Assessment

Site: RAF Heyford, Oxfordshire
Client: BWB Consulting Limited

1. Introduction

1.1. Background

1st Line Defence has been commissioned by BWB Consulting Limited to conduct a Detailed Unexploded Ordnance (UXO) Risk Assessment for the works proposed at RAF Heyford, Oxfordshire.

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.'

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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 RAF Heyford, Oxfordshire. 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 aerial 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 Oxfordshire History Centre.
- Historical mapping datasets.
- Historic England National Monuments Record.
- Relevant information supplied by BWB Consulting Limited.
- Available material from 33 Engineer Regiment (EOD) Archive (part of 29 Explosive Ordnance 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.

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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.'[1]

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.

[1] http://www.nationalarchives.gov.uk/help-with-your-research/research-guides/bomb-census-survey-records-1940-1945/.

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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 co-ordinators, 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.

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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 aerial 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.

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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.

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6. The Site

6.1. Site Location

The site is located approximately 4km west to 7.5km north-west of Bicester town centre and approximately 17.5km north of Oxford city centre. The villages of Ardley and Fewcott are located between the northern and western sections of the site, whilst the village of Middleton Stoney is located to the south-west of the site.

The site is bound to the north, east and south by large areas of areas of undeveloped agricultural land, farm access tracks, as well as several minor and some major roadways, including *Ardley Road*, *B4100*, B430, *A43*, *M4*0, to the west by the runway and structures of the former RAF/USAF Upper Heyford aerodrome, areas of agricultural land, woodland, several roadways including *Camp Road*, *Chilgrove Drive*, *Somerton Road*, and a section of the *Chiltern Railway line*.

The site is approximately centred on the OS grid reference: **SP 53884 26661**.

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

6.2. Site Description

Recent aerial imagery dated May 2020 indicates that the site predominantly comprises large areas of undeveloped land, interspersed with areas of vegetation, farm access tracks, a section of the *Chiltern Railway line,* and several sections of roadway throughout; including the Ardley Road, *M40 motorway*, *A43 and B430.*

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 BWB Consulting Limited indicates that the nature of the proposed works will include the construction of a rail freight interchange and large distribution facilities which will include extensive earthworks, building sheds and new roads. Ground investigation work will include 120 exploratory holes across the site, consisting of trial pits, shallow dynamic samples holes and deeper rotary boreholes.

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8. Ground Conditions

8.1. General Geology

The British Geological Survey (BGS) map shows the site to be predominantly underlain by White Limestone Formation - Limestone, with no recorded superficial deposits. The site is also interspersed with smaller areas of Rutland Formation – Mudstone, with superficial deposits of Head - Clay, Silt, Sand and Gravel in the north-west section of the site, and areas of Forest Marble Formation – Limestone, with superficial deposits of Alluvium - Clay, Silt, Sand and Gravel throughout the southern and western sections of the site. The entire site area is underlain by Sedimentary Bedrock formed during the Jurassic Period.

8.2. Site Specific Geology

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

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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. Summary of the Historical Background of the Site

The site was located adjacent to the WWI and WWII-era airfield RAF Upper Heyford which was predominantly used as a training station throughout this period in order to develop the skills of novice aircrews. Upper Heyford was also used to develop and familiarise pilots with new avionics such as long-range navigational equipment.

With the advent of WWII the airfield, RAF Bomber Command squadrons were stationed there and subsequently posted to the continent upon the outbreak of hostilities. Following the retreat from Dunkirk in June 1940, a number of Operational Training Unit (OTU) squadrons were established across the county, and 16 OTU took up residence of Upper Heyford. Equipped with Handley-Page Hampden, Avro Anson and later Wellington bombers, the unit was tasked with training air crews before they were assigned to active Bomber Command units. However, 16 OTU regularly took part in bombing missions over occupied Europe.

In the post-WWII era, the base was leased to the USAF, which used Upper Heyford and other bases in Western England as bases for Strategic Air Command (SAC) until the mid-1960's. SAC was a quick reaction force designated to undertake a retaliatory or pre-emptive nuclear strike against the USSR and Eastern Bloc countries in the event of a nuclear war. In the latter stages of the cold war, the nuclear deterrent role was superseded by Intercontinental Ballistic Missiles (ICBM) launched from static silos and Polaris missiles launched from submarines. As such, the need for an aerial delivered nuclear bomb was diminished and the 20th Tactical Fighter Wing (TFW) took up primary residence of Upper Heyford, which remained until the base closed in 1994. See **Annex D** for details and imagery of the airfield.

9.3. Ordnance Survey Historical Maps

Relevant historical maps were obtained for this report and are presented in **Annex E.** See below for a summary of the site history shown on acquired mapping.

Pre-WWII		
Date	**Scale**	**Description**
1923	1:10,560	This pre-WWII OS mapping edition dated 1923 indicates that the site area predominantly occupies open areas of undeveloped land, as well as numerous roadways. A section of the Great Western Railways can be seen to bisect the north-eastern and south-western sections of the site. The site is shown to be void of structural development however, some small unidentified structures can be seen within the southern area of the site. Several villages can be seen in the surrounding area, Fewcott and Ardley are shown to occupy an area between the north-western section and north-eastern sections of the site, Bucknell to the south-east, Middleton Stoney to the south and south-west, Fritwell to the north and north-west.

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Post-WWII		
Date	**Scale**	**Description**
1955	1:10,560	No major discernible changes have occurred within the bounds of the site. One structure previously adjacent to the northern most section of the site is no longer depicted. Some mapping changes have occurred within previously agricultural fields to the west of the site.
1979 – 1993	1:10,560	No major discernible changes have occurred within the bounds of the site. The runway, hardstanding taxiways, aircraft hardstandings and perimeter fence of the *Upper Heyford Airfield* can be seen immediately adjacent to the western section of the site.

9.4. WWII-era RAF Site Plans

WWII-era RAF site plans of RAF Upper Heyford have been obtained from the RAF Museum at Hendon and Airfield Focus: Upper Heyford. This imagery provides a view of the airfield in 1942 and 1945. (see **Annex F**). See below for a description:

Title of Photograph	**Comments**
Upper Heyford, 1942 (Airfield Focus)	This RAF plan of the site dated 1942 shows the site to comprise a large, mostly unpaved landing ground, surrounded by a hardstanding taxiways. The airfield is shown to comprise 33 aircraft dispersal pans, four of which are shown to be situated outside the bounds of the airfield perimeter fence to the north. Several features are marked on the site plans including the *Flying Control* (tower), *Machine Gun Range*, *Bulk Fuel tanks* and *Bomb dump.* Six hangers and several unidentified structures are also shown to be within the south-eastern section of the airfield. The western most section of the site is shown to be located immediately adjacent to five aircraft dispersal pans and the eastern-most segment of the airfield perimeter fence.
Upper Heyford, June 1945 (RAF Hendon)	This RAF plan of the site date June 1945 indicates that the airfield has been subject to considerable development. An 'A-Frame' consisting of three tarmac airstrips can now be seen to occupy the majority of the airfield, surrounded on all sides by hardstanding taxiways and aircraft dispersal pans. The airfield perimeter has also been expanded to the north and north-east. The western most section of the site is shown to be located immediately adjacent to five aircraft dispersal pans, four 'Gun Pit Huts', the eastern-most segment of the airfield perimeter fence as well as the gymnasium and chapel.

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10. Introduction to German Aerial Delivered Ordnance

10.1. General

During WWI and WWII, the UK was subjected to bombing which often resulted in extensive damage to city centres, docks, rail infrastructure and industrial areas. The poor accuracy of WWII targeting technology and the nature of bombing techniques often resulted in neighbouring areas to targets sustaining collateral damage.

In addition to raids which concentrated on specific targets, indiscriminate bombing of large areas also took place. This occurred most prominently in the London 'Blitz', though affected many other towns and cities. As discussed in the following sections, a proportion of the bombs dropped on the UK did not detonate as designed. Although extensive efforts were made to locate and deal with these UXBs at the time, many still remain buried and can present a potential risk to construction projects.

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

10.2. Generic Types of WWII German Aerial 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 aerial 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 i-iii**.

Generic Types of WWII German Aerial 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 **Annex G**). 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.

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10.3. Failure Rate of German Aerial Delivered Ordnance

It has been estimated that 10% of WWII German aerial 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 H**.

10.4. 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.

10.4.1. The J-Curve Effect Principle

J-curve is the term used to describe the characteristic curve commonly followed by an aerial 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 G**).

10.4.2. 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.

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10.4.3. Site Specific Bomb Penetration Considerations

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

- WWII geology – White Limestone Formation – Limestone, smaller areas of Rutland Formation – Mudstone, areas of Forest Marble Formation – Limestone. Sedimentary bedrock. Superficial deposits include Head - Clay, Silt, Sand and Gravel and Alluvium – Clay, Silt, Sand and Gravel.
- 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 lack 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.

10.5. 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 within the Rural District of Ploughly 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.

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11. The Likelihood of Contamination from German Aerial Delivered UXBs

11.1. 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 I**. This source does not record any WWI bombing incidents to have affected the site area or the town of Bicester.

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.

11.2. World War II Bombing of the Rural District of Ploughly

The Luftwaffe's main objective for the attacks on Britain was to inhibit the country's economic and military capability. To achieve this they targeted airfields, depots, docks, warehouses, wharves, railway lines, factories, and power stations. As the war progressed the Luftwaffe bombing campaign expanded to include the indiscriminate bombing of civilian areas in an attempt to subvert public morale.

During WWII the site was located within the Rural District of Ploughly, which sustained an overall very low density of bombing, as represented by bomb density data figures presented in **Section 11.3.** This was mainly due to the composition of the area in which the site was located; within a large rural area, away from the main industrial targets and residential areas. As such, the Rural District of Ploughly did not offer the same number of strategic targets as other more densely populated areas of Britain. Despite this, the Oxfordshire are was subject to numerous Luftwaffe bombing raids owing to the large number of airfields situated within the county.

RAF Upper Heyford, which was located adjacent to the west of the site, was operational during WWI, the inter-war period and WWII. Prior to the outbreak of WWII, German intelligence had identified the RAF as one of the greatest obstacles to an invasion of Britain, and so plans were made to cripple the RAF by means of cratering runways, destroying aircraft and airfield facilities. As RAF Upper Heyford, was occupied by units of RAF Bomber Command at the outbreak of hostilities, the airfield presented a key strategic Luftwaffe bombing target that was subject specific raids on several occasions.

Other RAF aerodromes and satellite airfields were also situated within the wider vicinity; notably RAF Croughton, RAF Weston-on-the-green and RAF Bicester located approximately 2.2km north-east 2.6km south and 3.8km south-east of the site respectively.

Records of bombing incidents in the civilian areas of the Rural District of Ploughly 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.

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11.3. WWII Home Office Bombing Statistics

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

Record of German Ordnance Dropped on the Rural District of Ploughly		
Area Acreage		**79,910**
Weapons	High Explosive bombs (all types)	275
	Parachute mines	0
	Oil bombs	3
	Phosphorus bombs	0
	Fire pots	0
	Pilotless aircraft (V-1)	0
	Long range rocket bombs (V-2)	0
Total		**278**
Number of Items per 1,000 acres		**3.5**

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.

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11.4. Oxfordshire Bomb Map

A local bomb map compiled by the Centre for Oxfordshire Studies showing HE bomb, incendiary bomb and aerial delivered strikes on the county was obtained from Oxfordshire County Council.

The section showing the area of the site is described in the table below and presented in **Annex J**. Although it should be noted that this bomb map only records the date, number and types of bombs that fell within the vicinity of a civil parish, and does not plot the exact locations of each strike.

Oxfordshire Bomb Map	
Date Range	**Comments**
26th June 1940 – 1945	27 HE bomb strikes and two HE UXB strikes were recorded within the vicinity of Upper Heyford. 16 HE bomb strikes and one HE UXB strike was recorded within the vicinity of Fritwell. One HE bomb strike and several Incendiary bomb strikes were recorded within the vicinity of Stoke Lyne. Three HE bomb strikes and one HE UXB was recorded within the vicinity of Bigwell Park.
27th July 1940	Fritwell. 14 HE bomb strikes and one HE UXB strike.
26th – 27th August 1940	Bignell Park. Three HE bomb strikes and one HE UXB strike.
21st October 1940	Upper Heyford. 10 HE bomb strikes.
13th November 1940	Upper Heyford. Two HE bomb strikes.
15th – 16th November 1940	Stoke Lyne. One HE bomb strike.
16th – 17th November 1940	Fritwell. Two HE bomb strikes.
20th – 21st November 1940	Upper Heyford. 13 HE bomb strikes.
27th March 1941	Upper Heyford. Two HE bomb strikes and two HE UXB strikes.
10th – 11th April 1941	Stoke Lyne. Several Incendiary bomb strikes.

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11.5. Oxfordshire ARP Logbook

Written bomb incident records for the county of Oxfordshire were obtained from Oxfordshire History Centre. This record was compiled by local Air Raid Precaution (ARP) personnel and volunteers during the war and records the location, date and time of bombing raids, as well as the types of bomb used and the damage caused.

A transcript of the associated written records of bomb incidents in the site locality are presented in the table below. Only those recorded incidents on or in close proximity to the site have been highlighted. An example of this record is presented in **Annex K**.

Oxfordshire ARP Logbook		
Date	**Type of bomb**	**Comments**
26th June 1940	Unknown Number of HE	Bombs dropped in the vicinity of the emergency landing ground at Weston-on-the-Green. Ground lights were reported to have been in evidence during the raid. The majority of bombs dropped were of small calibre.
9th August 1940	16 x HE	5 bombs dropped on aerodrome emergency landing ground and 11 in a straight line between Weston-on-the-Green and Chesterton. All bombs were of small calibre forming small craters. Explosions were heard at a considerable distance. Bicester A.R.P. personnel mobilised on hearing bombs dropped.
25th/26th August 1940	5 x HE	Weston-on-the-Green (5 H.E.) According to Mr Stenning, it is estimated that a large number (100) of Incendiary Bombs were dropped over the Bicester Area, but the correct number cannot be ascertained. A great number of these Incendiary Bombs were dropped in the Weston-on-the-Green district. Whilst they were still flaring on the ground another plane dropped H.E. Bombs amongst them.
26th/27th August 1940	10 x HE	At Weston-on-the-Green the bombs dropped in a field, the target in this instance presumably being the Weston-on-the-green R.A.F. landing ground. The bombs dropped at Chesterton also fell in a field.
29th/30th August 1940	5 x HE	4 HE bombs at Weston-on-the-Green landing ground and 1 HE bomb in a field.
4th/5th September 1940	Unknown Number of UXB's	East side of Weston-on-the-Green landing ground as these bombs fell on R.A.F. property they were exploded by them.
3rd/4th October 1940	3 x HE 1 x HE DAB 100 I.B.	3 HE were dropped on the right hand side of Akemen Street in Kirklingotn Parish, two exploded on impact, the other being a (DAB) which exploded at 7:45am on 4th October 1940. The fourth HE fell on the left hand side of Akeman Street in Weston-on-the-Green Parish, and exploded on impact. All bombs fell on open ground. The 100 I.B. fell between Weston Village and Weston Park Farm, and hedge fires were quickly extinguished.
21st October 1940	**10 x HE**	**Heyford Aerodrome. 8 HE were dropped on the flying ground and 2 in a field adjoining. The line of bombs was from north to south.**

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6th/7th November 1940	11 HE	Islip and Lower Heyford. These bombs dropped in a direct line between Islip and Lower Heyford in ploughed and grass fields. One of these was a camouflet.
13th November 1940	**Unknown Number of Bombs**	**Heyford. These bombs were dropped on the R.A.F. Station, Upper Heyford, near the bomb dump. Flying debris caused slight damage to two Hampden Bombers and a concrete mixer.**
16th/17th November 1940	2 x HE	Fritwell. 1 HE fell in an allotment between Fritwell Course and Fritwell Cross Roads, the other 300 yards north-east of Fritwell School. 3 plate glass windows of Mr. Dew's shop were smashed and windows in Fritwell School.
20th/21st November 1940	**12 x HE** **1 x HE DAB** **Large Number of I.B.s**	**Upper Heyford. These bombs were dropped in two lines running from north to south, separated by about half a mile of open country. The last bomb made a direct hit on a house, but the occupant had a miraculous escape, crawling from under debris uninjured. Three of the I.B.s fell on the thatched roof of a barn setting fire to the thatch, but this was soon extinguished by local people. The DAB later exploded.** **Cottage demolished and next door cottage badly cracked.**
27th February 1941	**2 x HE** **2 x HE UXB**	**Heyford, These bombs fell on the R.A.F. landing ground at Upper Heyford, one causing a crater 15' wide and the other causing gorund eruption. The 2 UXB's were also dropped at the same time.** **Considerable number of windows broken in Aerodrome buildings.** **Wellington aircraft destroyed.**
23rd/24th May 1941	4 x HE	These four bombs were dropped on the R.A.F. landing ground half-a-mile east of Brackley-Oxford Main road.

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11.6. Online/Anecdotal References to the Bombing of RAF Upper Heyford

Anecdotal references referring to the Bristol Whitchurch Airport and Luftwaffe bombing raids in the vicinity of the site and RAF Upper Heyford were obtained from a variety of online sources including official documentation, first hand anecdotal accounts from people who worked at the airport and locals who lived in the surrounding environs. Some examples of the references relating to the vicinity are transcribed below and those believed to be located in proximity to the site are highlighted in boldface.

Online/Anecdotal References to the Bombing of RAF Upper Heyford	
Extracts from Bicester Local History Society[2]	
Date Range	**Comments**
13th October 1940	"Although few bombs fell on the area, Weston-on-the-Green airfield became the most heavily bombed location in Oxfordshire as a number of German aircraft dropped their deadly cargo on the airfield when returning from raids on other targets. Bicester airfield was attacked by an enemy aircraft on 13th October 1940. Anti-aircraft defences damaged the attacking aircraft which eventually crashed in the south of the county." Weston-on-the-Green was located approximately 2.5km south of the site.
14th November 1940	"Local residents living in the town at the time still recall the vivid memory of the drone of enemy bombers flying towards Coventry on 14 November 1940."

[2] *https://www.blhs.org.uk/index.php/head_military/world-war-ii*

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11.7. Published Literature Referring to the Bombing of RAF Upper Heyford

Published literature referring to the Bristol Whitchurch Airport and Luftwaffe bombing raids in the vicinity of the site and RAF Upper Heyford were obtained. These include compiled information from official accounts and records, as well as first-hand anecdotal accounts from people who worked at the Bristol Whitchurch Airport. Some examples of the references relating to the site are transcribed below.

Published Literature Referring to the Bombing of RAF Upper Heyford	
Extracts from Airfield Focus: Upper Heyford[3]	
Date Range	**Comments**
25th August 1940	"11 bombs on 'Q' decoy site Otmoor." 'Q' decoy site in Otmoor was located approximately 10km south of the site.
13th November 1940	**"Two bombs on Upper Heyford."** **"Damaged a Hampden and blew open a steel door on a bomb store."** **Located immediately west of the site or up to approximately 2km west of the site.**
20th November 1940	**"Some bombs fell near the airfield boundary."** **Located immediately on site or up to approximately 2km west of the site.**
27th February 1941	**"Four bombs dropped by JU88, two of which did not explode damaging five aircraft and injuring two airmen."** **Located immediately west of the site or up to approximately 2km west of the site.**

[3] *Davis, P., Airfield Focus: Upper Heyford., GMS Enterprises., 2001*

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11.8. Post-WWII Era Aerial Photography

Post-WWII era aerial photography for the site area was obtained from the National Monuments Record Office (Historic England). This photography provides a record of the potential composition of the site during the war, as well as its condition immediately following the war. (**See Annex M & N**).

WWII-Era Aerial Photography	
Date	**Description**
16th April 1947 (Historic England)	This post-WWII era aerial image date 1947 gives a good account of the RAF Upper Heyford airfield in the immediate post-war era. Presenting the composition and structural outlay of the airfield as it would have been during the latter stages of WWII. Six hangers, an aircraft technical area and several administrative structures can be seen within the south-east. The remainder of the airfield is comprised of an 'A-Frame' set of three tarmac runways, surrounded on all sides by a hardstanding taxiway interspersed with several aircraft dispersal pans. Some remaining sections of old perimeter track can be seen within the northern areas of the airfield, giving an idea as to the extent of the expansion which occurred in 1943.
31st August 1954 (Historic England)	This post-WWII era aerial image dated 1954 gives a good account of Upper Heyford after its lease to the USAF and expansion to support large bombers of Strategic Air Command (SAC). The airfield runway is shown to be in the process of expansion at the time this photograph was taken, as well as other facilities across the airbase, including new aircraft hardstandings and new bomb store areas. See **Annex N2** for an overlay of the aerial image.

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11.9. Introduction to WWII-era Bombing Decoy Sites

The decoy principal – drawing German bombers away from their designated targets onto dummy sites five or six miles away – began in WWI to protect RAF stations. In 1939, a new department was set up to investigate and coordinate the concept of defence by deception. A whole range of decoy sites were developed – some of them became very elaborate and covered large areas.

Common WWII Decoy Site Variants	
Decoy Type	**Description**
K-site	Daytime dummy airfield. Dummy aircraft and infrastructure.
Q-site	Night time dummy airfield. Intended to represent the working lights of an airfield after dark.
QL	Night time dummy infrastructure. Replicating the lights and workings of marshalling yards, naval installations, armament factories etc.
QF	Fire based decoy. Initially for aircraft factories, RAF maintenance units and ordnance works to simulate them on fire following bombing.
Oil QF	Simulation of burning oil tanks.
Starfish	Replicating a city under incendiary attack.

By June 1944, decoy sites had been attacked on 730 occasions. Attacks ranged from a single night-time bomber dropping its load onto a "Q" site, to the mass attacks on Starfish sites. In misleading air attacks away from intended targets, they were responsible for protecting cities, key Allied installations and saved the lives of thousands of people.

As WWII decoys were specifically designed to be bombed, proposed works planned in the vicinity of such installations can be at an elevated risk from German aerial delivered UXBs. It was not uncommon for evidence of UXBs at a decoy site to be overlooked following an air raid. Given that such installations were on open ground, sometimes agricultural fields, UXB entry holes were not always evident.

The closest recorded decoy site was located approximately 10.2km south-east of the site, in the vicinity of Otmoor. This was an RAF Airfield Decoy site of Q and K type, which was specifically intended to draw Luftwaffe attention away from RAF Upper Heyford and the other satellite airfields within the locality.

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11.10. 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.

11.11. 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) is currently facing considerable delay. 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 does not make reference to such instances occurring within the site of proposed works. If any relevant information is received at a later date, BWB Consulting Limited will be advised.

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11.12. Evaluation of German Aerial Delivered UXO Records

Factors	Conclusion
Density of Bombing *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.*	During WWII the site was located within the Rural District of Ploughly, which was subject to an overall very low density of bombing according to Home Office bombing statistics, with an average of 3.5 items of ordnance per 1,000 acres. This was mainly due to the lack of strategic bombing targets and the large areas of agricultural land that predominantly occupied much of the rural districts. As the site comprised agricultural land during WWII, there is no particular reason to suspect that the site area itself would have been targeted or directly attacked. However, the presence of strategic targets in the wider vicinity; notably RAF Upper Heyford airfield immediately adjacent to the west of the site, RAF Weston-on-the-Green which was located approximately 2.5km south, RAF Croughton located approximately 2.5km north and RAF Bicester, located approximately 4.3km south-east of the site. These are known to have been subject to specific bombing raids, and their relative proximity is anticipated to cause a slight elevation of the bomb density across the site area. More than 62 HE bomb strikes are recorded to have fallen in the vicinity of Weston-on-the-Green parish to the south of the site, 29 within the parish of Upper Heyford parish immediately to the west, 17 in Fritwell parish to the north-west, one HE bomb strike and several Incendiary bombs within Stoke Lyne parish. **Annex L** provides an overlay of bomb strikes with specified and approximate locations derived from local ARP Logbook records obtained from Oxfordshire History Centre and a bomb map obtained from Oxfordshire County Council. Although it should be noted that this map does not provide a comprehensive account of the bombing on site, nor does it denote exact bomb strike locations.
Damage *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.*	Due to the size and largely rural nature of the site, it has not been possible to assess signs of damage across the entire area in detail. Although on the basis of OS mapping structures in the area surrounding the site appear intact in the post-war era. It may be noted that evidence of damage at the locations of the site which consist of open ground would likely be difficult to discern. The absence of visible damage throughout the site is therefore not necessarily indicative of a lack of bombing on site.
Ground Cover *The nature of the ground cover present during WWII would have a substantial influence on any visual indication that may indicate UXO being present.*	As much of the site was occupied by open rural land, it is considered possible that UXBs could have gone undetected, as bomb entry holes may have been obscured or overlooked. For example, the entry hole for a 50kg UXB can be as small as 20cm in diameter. As such, the possibility that an item of UXO fell on site unnoticed and unrecorded cannot be confidently discounted. Areas that were occupied by structures, roadways and other infrastructure are considered to have been more conducive to observation of evidence of UXO.

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Access Frequency *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.*	Access and general monitor within sections of the site which were located in a close proximity to structures and roadways is considered to have been broadly frequent. As such, any incidents in such areas are likely to have been noticed and recorded, although this cannot be completely guaranteed. Large sections of the site were occupied by open agricultural land which was likely to have been subject to only seasonal access by farmers, and therefore the possibility that items of UXO may have gone missing in such areas is considered more likely.
Bomb Failure Rate	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.
Abandoned Bombs	1st Line Defence holds no records of abandoned bombs at or within the site vicinity.
Bombing Decoy sites	1st Line Defence could find no evidence of bombing decoy sites within the site vicinity. A geo-dataset held in-house indicates that the closest recorded decoy site was located approximately 10.2km south-east of the site, intended to draw Luftwaffe attention away from RAF Upper Heyford.
Bomb Disposal Tasks	1st Line Defence could find no evidence of bomb disposal tasks within the site boundary and immediate area.

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12. Introduction to Allied Ordnance

12.1. General

Many areas across the UK may be at risk from Allied UXO because of both wartime and peacetime military use. Typical military activities and uses that may have led to a legacy of military UXO at a site include former minefields, home guard positions, anti-aircraft emplacements, training and firing ranges, military camps, as well as weapons manufacture and storage areas.

Although land formerly used by the military was usually subject to clearance before returned to civilian use, items of UXO are sometimes discovered and can present a potential risk to construction projects.

This section of the report discusses the generic types of Allied ordnance typically encountered on areas associated with former military activity.

12.2. Nuclear Weaponry

The western section of the site is known to have been located immediately adjacent to a bomb store area associated with USAF Upper Heyford. This feature has been identified as the South Nuclear Bomb Store, as presented within **Annex O**. The consideration of risk from any nuclear weaponry or associated components is beyond the remit of this report and should be separately assessed, if deemed necessary.

12.3. Land Service Ammunition

Owing to the sites location adjacent to RAF/USAF Upper Heyford, its associated bomb storage area, the sites close proximity to the Middleton Stoney Camp, in which US Army troops are known to have been stationed prior to the invasion of Europe, as well as anecdotal accounts of training exercises in the surrounding countryside; the risk from items of Land Service Ammunition (LSA) must be considered.

The term 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:

In the UK unexploded or partially exploded mortars and grenades are the most common items of LSA encountered, as they could be transported and utilised anywhere. They are mostly encountered in areas used for military training and are often found discarded on or near historical military bases. Images of the most commonly found items of LSA are presented in **Appendices iv - vi.**

12.4. Small Arms Ammunition

Owing to the above mentioned reasons presented within **Section 12.2**, notably the presence of US Army Troops in the site locality and anecdotal accounts of military training exercises in the vicinity, the risk from items of Small Arms ammunition (SAA) must be considered.

The most common type of ordnance encountered on land used by the military are items of Small Arms Ammunition (SAA). 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 images of the most SAA are presented in **Appendix vii.**

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12.5. Defending the UK From Aerial Attack

During WWII the War Office employed a number of defence tactics against the Luftwaffe from bombing major towns, cities, manufacturing areas, ports and airfields. These can be divided into passive and active defences (examples are provided in the table below).

Active Defences	Passive Defences
• Anti-aircraft gun emplacements to engage enemy aircraft. • Fighter aircraft to act as interceptors. • Rockets and missiles were used later during WWII.	• Blackouts and camouflaging to hinder the identification of Luftwaffe targets. • Decoy sites were located away from targets and used dummy buildings and lighting to replicate urban, military, or industrial areas. • Barrage balloons forced enemy aircraft to greater altitudes. • Searchlights were often used to track and divert adversary bomber crews during night raids.

Active defences such as anti-aircraft artillery present a greater risk of UXO contamination than passive defences. Unexploded ordnance resulting from dogfights and fighter interceptors is rarely encountered and difficult to accurately qualify.

12.5.1. Anti-Aircraft Artillery (AAA)

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 LSA 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	The three inch unrotated rocket/projectile known as the UP-3 had initially been developed for the Royal Navy. The UP-3 was also used in ground-based single and 128-round launchers known as ''Z'' batteries. The rocket, containing a high explosive warhead was often propelled by cordite.			

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The conditions in which anti-aircraft projectiles may have fallen unnoticed within a site area are analogous to those regarding aerial delivered ordnance. Unexploded anti-aircraft projectiles could essentially have fallen indiscriminately anywhere within range of the guns. The chance of such items being observed, reported and removed during the war depends on factors such as land use, ground cover, damage and frequency of access – the same factors that govern whether evidence of a UXB is likely to have been noted. More information about these factors with regards to this particular site can be found in the German Aerial Delivered Ordnance section of this report.

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

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13. The Likelihood of Contamination from Allied Ordnance

13.1. 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 ago 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, aerial 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 a site with a history of military usage. Such factors are typically dependent upon the proximity of the proposed area of works to training activities, munition productions and storage, as well as its function across the years.

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

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13.2. Military History of the Site of Proposed Works

13.2.1. WWI-era

RAF Upper Heyford was conceived during the days of the Royal Flying Corps in World War I. In 1916, Canadian engineers began laying out a landing field on the plateau above the Cherwell valley, west of Bicester, where airmen could train before going to the front. The 257 acre airfield opened in 1918, comprising six hangars, a tarmac apron, as well as a technical area within the south-east corner of the airfield. Upper Heyford was home to three squadrons of the new Royal Air Force and their Sopwith Dolphins and Salamander aircraft. From August 1918, the first two squadrons of the infant Canadian Royal Air Force were also established on the base, though the war ended before they became active.[4]

13.2.2. Interwar Period

During the interwar period RAF Upper Heyford was redeveloped into a bomber station, and in 1927 was occupied by Hyderabads of 10 and 99 Squadrons. In 1936 and with the advent of the rearmament programme, Upper Heyford became part of Number 1 Bomber Group of the new Bomber Command. Its Long Range Development flight of Vickers Wellesleys helped develop the navigation and endurance skills that made long-range bombing missions possible. The station also played a role in research into radar, when one of its planes became the first one ever to be tracked by radio waves, via the BBC transmitter at Daventry in Northamptonshire.

13.2.3. WWII-era

With war imminent 70 Bomber Wing was reformed at Upper Heyford on 1st September 1939. This was an aerial component for the British Expeditionary force which undertook strategic aerial reconnaissance for the army in France. After their departure to the continent, Upper Heyford was placed under 6 group in a pilot training role with use of Handley Page Hampdens and Avro Anson medium bombers. The need for skilled bomber crews increased exponentially as many were lost during the first year of the war. As such 16 Operational Training Unit (OTU), one of 22 such units that were formed to train crews for their operational role in mid-1940. The Hampdens of OTU 16 saw their first action in July – October 1940 tasked with dropping leaflets over occupied territory in France, in which they were also armed with 2 x 250lb bombs.

As the Battle of Britain approached a 'Q' site decoy airfield was set up near Otmoor in anticipation of German aerial attacks on RAF airfields. Both the decoy site and airfield received several bomb strikes throughout the main period of bombing.

During mid-1941, 16 OTU at Upper Heyford started to be reequipped with Vickers Wellington bombers and they were involved in their first 1,000 bomber raid against Cologne on 30th/31st May 1941, also the first in which 16 OTU were used to bomb targets within Germany. The unit subsequently took part in large scale bomb raids on Essen on 1st/2nd June 1941 and Bremen on 25th/26th June 1941. Subsequent attacks on Dusseldorf, Bremen and Essen were undertaken in September.

During March to September 1944, Upper Heyford's grass and wire-mesh runways were replaced by three new tarmac runways, complete with concrete taxiways, 22 aircraft dispersal pans and seven loop hardstandings. At this late stage in the war, bomber squadrons were well equipped with trained crews and bomber Operational Training Units (OTU), including 16 OTU at Upper Heyford, were disbanded. 1655 Training Unit then took up residence at the airfield, tasked with training crews on De Havilland Mosquitos, a twin-engine multirole fighter bomber. This remained until the end of WWII.[5]

[4] *http://www.bbc.co.uk/oxford/content/articles/2009/02/16/raf_upper_heyford.shtml*
[5] *Davis, P., Airfield Focus: Upper Heyford., GMS Enterprises., 2001*

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During WWII, the Middleton Stoney Camp, which was located approximately 250m – 1.2km west of the southern-most section of the site, is known to have been occupied by the Lancashire Fusiliers, housing searchlight batteries and machine guns. Part of the camp was used to station Italian and German prisoners of war, organising them into work parties for use on farms and quarries in the surrounding area.[6] Middleton Stoney is also reported to have been used to store equipment for Upper Heyford, included a firing range, stationed US Army troops prior to the D-Day landings and comprised a US military hospital.

13.2.4. Post-WWI era

As WWII ended and the Cold war began, the USAF leased the airfield from the Ministry of Defence as part of the NATO (North Atlantic Treaty Organization) alliance in 1952, as well as three other airfields in the west of England; Brize Norton, Fairford and Greenham Common. Upper Heyford was given new runways, aprons and hard standings, as well as 170 new buildings such as the innovative nose-docking sheds that allowed maintenance of the new generation of US bombers, high off the ground.

The USAF's Strategic Air Command (SAC) stationed B-47 bombers at Upper Heyford, which remained until 1965. Upper Heyford was also used by reconnaissance aircraft that gathered intelligence on Soviet radar and communications, and helped monitor Soviet nuclear tests. Air sampling was undertaken at very high altitudes over test sites to see what could be learned about the latest Soviet weapons. [7]

The 66th Tactical Reconnaissance Wing (TRW) took up residence with the RF-101C "Voodoo" until 1969. By the mid-1970's, the F-100's of the 20th Tactical Fighter Wing (TFW) arrived, but were replaced soon after by the F-111E, "Aardvark". Subsequent squadrons of EF-111A “Raven” were stationed at Upper Heyford and used in conjunction with their strike aircraft counterparts on bombing raids on Libya in 1986 and Iraq in 1991 as part of Operation Desert Storm.[8]

The collapse of the USSR led to a US demobilisation of several airbases within the UK, and brought US occupancy and operations at Upper Heyford to a close in 1994.

[6] *http://smhccg.org/village-history/prisoner-of-war-camp/*
[7] *https://www.forces-war-records.co.uk/units/712/raf-upper-heyford*
[8] *https://military.wikia.org/wiki/RAF_Upper_Heyford*

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13.3. Online/Anecdotal References to the Allied/Military Activity Within the Site Locality

Anecdotal references referring to the RAF/USAF Upper Heyford and Allied/military related activity that took place throughout WWII in site locality were obtained from a variety of online sources including official documentation, first hand anecdotal accounts from people who worked at the airbase and locals who lived in the surrounding environs. Some examples of the references relating to the vicinity are transcribed below and those believed to be located in proximity to the site are highlighted in boldface.

Online/Anecdotal References to the Allied/Military Activity Within the Site Locality	
Extracts from Browns at Park Farm[9]	
Date Range	**Comments**
1939 – 1945	In the Second World War the farms park land was used as a base, for storing aeroplanes, as a firing range and there was also a camp hospital for treating injured soldiers.
Extracts from Stoney Middleton Heritage[10]	
1939 – 1945	The camp was originally established as a military encampment at the beginning of the war, manned, by the Lancashire Fusiliers. The camp housed powerful searchlights and machine guns, placed to protect the production of essential materials from the quarries, searching out and shooting down any attempted German bomb attack. The camp was built on land between Middleton Hall and Calver, now the Meadow Close development.
Extracts from Bicester Local History Society[11]	
1939 – 1945	As the war progressed military forces built up in the area and training exercises became a regular feature in the surrounding countryside. Army camps were built on the outskirts of the town off the Bucknell Road and at Ambrosden. American troops were based at Middleton Stoney and Kirtlington Park prior to the invasion of Europe.
Extracts from Ex Utopia RAF Upper Heyford[12]	
1950 – 1994	'There had been two main bomb storage areas at Upper Heyford. One in the south, I was told, where the conventional weapons had been stored. The northern area meanwhile was designated 'other weapons.'
1991	'Later, the fighter wing at Upper Heyford participated in Operation Desert Storm. Commencing in January 1991, the F-111Es of the 20th TFW joined the conflict in Iraq. They launched combat missions from Turkey and Saudi Arabia, evading Iraqi anti-aircraft artillery to target power plants, electronics sites, oil refineries and nuclear-biological-chemical processing facilities.' 'By the end of Desert Storm the wing had flown 1,798 sorties without a loss, dropping more than 4,700 tons of ordnance on its targets.'

[9] *https://brownsatparkfarm.co.uk/our-history/*
[10] *http://smhccg.org/village-history/prisoner-of-war-camp/*
[11] *https://www.blhs.org.uk/index.php/head_military/world-war-ii*
[12] *https://www.exutopia.com/usaf-upper-heyford-chasing-cold-war-ghosts-in-rural-oxfordshire/*

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13.4. Evaluation of Contamination Risk from Allied UXO

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

Sources of Allied UXO Contamination	Conclusion
Military Camps *Military camps present an elevated risk from ordnance simply due to the large military presence and likelihood of associated live ordnance training.*	1st Line Defence could find no evidence of a military camp within the site. A geo-dataset held in-house indicated that the Middleton Stoney Camp was located approximately 250m – 1.2km west of the southern-most section of the site. Middleton Stoney and the surrounding area is known to have been occupied by the Lancashire Fusiliers, housing searchlight batteries and machine guns. Part of the camp was used to station Italian and later, German prisoners of war, organising them into work parties for use on farms and quarries in the surrounding area.[13] Also during WWII, Middleton Stoney is said to have been used to store equipment for Upper Heyford, included a firing range, stationed US Army troops prior to the D-Day landings and was used as a US military hospital. [14][15]
Anti-Aircraft Defences *Anti-Aircraft defences were employed across the country. Proximity to anti-aircraft defences increases the chance of encountering AA projectiles.*	1st Line Defence could find no evidence of Anti-Aircraft defences such as a HAA or LAA gun emplacement occupying or bordering the site. The closest HAA was located approximately 7.7km north of the site, to the west of RAF Hinton-in-the-Hedges airfield. Despite this distance the maximum effective range of an AA projectile can be up to 15km. A geo-dataset held in-house indicates that several LAA batteries are known to have been located within the bounds of the RAF Upper Heyford airfield to the west of the site, the closest being located approximately 350m west of the western-most extent of the site. Although it is possible that additional mobile LAA batteries could have come to be located within or close to the site area for periods. The conditions in which HAA or LAA projectiles may have fallen unnoticed within a site footprint are analogous to those regarding German aerial delivered ordnance.
Home Guard Activity *The Home Guard regularly undertook training and ordnance practice in open areas, as well as burying ordnance as part of anti-invasion defences.*	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. As such, no positive evidence could be found to confirm the presence of HG units within proximity to the site.
Defensive Positions *Defensive positions suggest the presence of military activity, which is often indicative of ordnance storage, usage or disposal.*	There is no evidence of any pillbox, emplacement or other defensive features formerly located on or bordering the site footprint.

[13] *http://smhccg.org/village-history/prisoner-of-war-camp/*
[14] *https://brownsatparkfarm.co.uk/our-history/*
[15] *https://www.blhs.org.uk/index.php/head_military/world-war-ii*

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Training or firing ranges *Areas of ordnance training saw historical ordnance usage in large numbers, often with inadequate disposal of expended and live items. The presence of these ranges significantly impact on the risk of encountering items of ordnance in their vicinity.*	No evidence of training or firing ranges could be found within the site area, although anecdotal evidence indicates the presence of a firing range within the vicinity of Brown's at Park Farm, located approximately 1.1km west of the southern section of the site. RAF site plans obtained from the RAF Museum at Hendon indicates that and Machine Gun (MG) range was located within the bounds of RAF Upper Heyford approximately 615m west of the site.
Defensive Minefields *Minefields were placed in strategic areas to defend the country in the event of a German invasion. Minefields were not always cleared with an appropriate level of vigilance.*	There is no evidence of defensive minefields affecting the site.
Ordnance Manufacture/Storage *Ordnance manufacture indicates an increased chance that items of ordnance were stored, or disposed of, within a location.*	During WWII RAF Upper Heyford was used as an Operation Training Unit for Bomber Command which were involved in a number of bombing sorties over Germany. As such, bombs, fuses and ordnance of various types will have been stored within the bounds of the airfield in a dedicated bomb store area. This bomb store area has been identified on RAF site plans from 1942, presented within **Annex F1** and was located approximately 800m west of the site. After RAF Upper Heyford was leased to the USAF in 1950, the airfield underwent significant development and expansion. This included the construction of two additional bomb store areas; the northern bomb store and southern bomb store, presented within **Annex O**. the western section of the site was located approximately 180m from the northern bomb store area and immediately adjacent to the southern bomb store area. Information regarding the use of the bomb stores varies between sources, although as the airfield housed squadrons of Strategic Air Command (SAC) squadrons throughout the 1950's and 1960's, it is likely that one or both of these bomb stores were used to store nuclear weapons during this period, as well as a variety of conventional munitions throughout the USAF's tenure of the airfield.
Military Related Airfields *Military airfields present an elevated risk from ordnance simply due to the large military presence and likelihood of associated live ordnance training or bombing practice.*	The site was situated immediately bordering the perimeter boundary of RAF Upper Heyford which later became USAF Upper Heyford; a military airfield active during WWI, WWII and the cold war, from 1918 until 1993.

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14. The Likelihood of UXO Contamination Summary

The following table assesses the likelihood that the site was contaminated by items of German aerial 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	The research has evaluated pre- and post-WWII Ordnance Survey maps, Home Office bombing statistics, WWII-era site plans of RAF Upper Heyford, a local bomb map obtained from Oxfordshire County Council, local ARP Logbook records obtained from Oxfordshire History Centre, post-WWII era aerial imagery of the site, a geo-dataset held in-house, as well as anecdotal, published and online record sets. The record set is of generally satisfactory quality. WWII-era RAF site plans and published literature regarding RAF Upper Heyford gave a good insight into the composition and use of the airfield throughout its operational history. However, whilst the date, number and type of bombs resulting from bombing raids within the site locality and surrounding environs were able to be corroborated between a local bomb map and local written records, the exact locations of these incidents were unable to be ascertained. As such only approximate locations of these strikes were able to be derived from the available record sets. Furthermore, owing to the development of the airfield during and in the post-war era, damage and potential ground disturbances as a result of bombing was not able to be distinguished within post-war aerial imagery.
German Aerial Delivered Ordnance	• During WWII the site was located within the Rural District of Ploughly, which was subject to an overall very low density of bombing according to Home Office bombing statistics, with an average of 3.5 items of ordnance per 1,000 acres. This was mainly due to the lack of strategic bombing targets and the large areas of agricultural land that predominantly occupied much of the rural districts. • As the site comprised agricultural land during WWII, there is no particular reason to suspect that the site area itself would have been targeted or directly attacked. However, the presence of strategic targets in the surrounding vicinity; notably RAF Upper Heyford airfield immediately adjacent to the west of the site, RAF Weston-on-the-Green which was located approximately 2.5km south, RAF Croughton located approximately 2.5km north and RAF Bicester, located approximately 4.3km south-east of the site. These are known to have been subject to specific bombing raids, and their relative proximity is anticipated to cause a slight elevation of the bomb density across the site area in general. More than 62 HE bomb strikes are recorded to have fallen in the vicinity of Weston-on-the-Green parish to the south of the site, 29 within the parish of Upper Heyford parish immediately to the west, 17 in Fritwell parish to the north-west, one HE bomb strike and several Incendiary bombs within Stoke Lyne parish. • **Annex L** provides an overlay of bomb strikes with specified and approximate locations derived from local ARP Logbook records obtained from Oxfordshire History Centre and a bomb map obtained from Oxfordshire County Council. Although it should be noted that this map does not provide a comprehensive account of the bombing on site, nor does it denote exact bomb strike locations. • It is evident that the closest bombing target would have been RAF Upper Heyford – various sources confirm that the airfield was attacked on several occasions, with bombs falling both on and close to the station. No bomb census mapping was available for the area, so it not clear exactly where all of the recorded bombs fell on and around the site. However, it might be argued that the risk of UXB contamination is elevated the closer the proximity to the airfield boundaries. • Due to the size and largely rural nature of the site, it has not been possible to assess signs of damage across the entire area in detail. Although on the basis of OS mapping structures in the area surrounding the site appear intact post-war.

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	• As much of the site was occupied by open rural land, it is considered possible that UXBs could have gone undetected, as bomb entry holes may have been obscured or overlooked in vegetated areas or areas under crop. The entry hole for a 50kg UXB can be as small as 20cm in diameter. As such, the possibility that an item of UXO fell on site unnoticed and unrecorded cannot be confidently discounted. Equally, overall, it is not considered likely that any one area of the site would have been frequently accessed or specifically checked for evidence of German air-delivered ordnance, given its open, agricultural nature. It is therefore conceivable that UXBs could have gone unnoticed if they fell within the site boundary. • In summary, given the various targets in the wider area, and the presence of RAF Upper Heyford to the west of the site, it has not been possible to entirely discount the risk of contamination from German aerial delivered ordnance within the bounds of the site. However, for the most part, the risk of contamination is not considered significantly elevated above the general 'background' level of risk for similar agricultural fields in the wider area. It has however been determined that the risk of contamination is likely to increase with closer proximity to the former airfield, which is known to have been attacked on a number of occasions. Although the site was not within the bounds of the airfield, the risk of contamination in the fields which immediately adjoin the airfield is assessed as elevated as a precaution. A risk map demonstrating this is presented in **Annex P1**.
Allied Ordnance	• During WWII RAF Upper Heyford was used as an Operational Training Unit for Bomber Command which were involved in a number of bombing sorties over Germany. As such, bombs, fuses and ordnance of various types will have been stored within the bounds of the airfield in a dedicated bomb store area. This bomb store area has been identified on RAF site plans from 1942, presented within **Annex F1** and was located approximately 800m west of the site. • After RAF Upper Heyford was leased to the USAF in 1950, the airfield underwent significant development and expansion. This included the construction of two additional bomb store areas; the northern bomb store and southern bomb store, presented on RAF site plans from 1994 within **Annex O**. The western section of the site was located approximately 180m from the northern bomb store area and immediately adjacent to the southern bomb store area. • Information regarding the use of the bomb stores varies between sources, although as the airfield housed squadrons of Strategic Air Command (SAC) squadrons throughout the 1950's and 1960's, it is likely that one or both of these bomb stores were used to store nuclear weapons during this period, as well as a variety of conventional munitions throughout the USAF's tenure of the airfield. • A geo-dataset held in-house indicated that the Middleton Stoney Camp was located approximately 250m – 1.2km west of the southern-most section of the site. Middleton Stoney and the surrounding area is known to have been occupied by the Lancashire Fusiliers, housing searchlight batteries and machine guns. The camp is also said to have been used to store equipment for Upper Heyford, included a firing range, stationed US Army troops prior to the D-Day landings and was used as a US military hospital. • A press article from April 2019 reports that two 'unexploded bombs' were removed from Camp Road – within former RAF Heyford, to the west of the site. It is thought possible they these were practice bombs – possibly of the small 10/11lb variety. This would not be unexpected given the history of the airfield. Such items would usually be 'targeted' at a specific location within the bounds of an airfield. However, it was not unheard of for practice bombing to overshoot and affect the land surrounding an historic airfield. • Consulted record sets indicates that no LAA or HAA batteries are known to have been located within or bordering the bounds of the site; the closest recorded was an LAA battery situated approximately 350m west of the site. Although it is possible that mobile LAA batteries could have come to be temporarily located within the site.

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	• No specific evidence of training or firing ranges could be found within the site area, although anecdotal evidence indicates the presence of a firing range within the vicinity of Brown's at Park Farm, located approximately 1.1km west of the southern section of the site. • In summary, whilst the site was located outside the demarcated bounds of the Upper Heyford airfield, and these allied features were not located directly within the bounds of the site, as a precaution, the fields immediately adjoining the airfield have been ascribed a higher level of risk than those further away. It is not unheard of for contamination to have occurred both within and immediately adjacent to airfield perimeters – through burial, burning, improper disposal, exercises etc. As with bombing risk, the risk of contamination from Allied items of ordnance is considered to 'drop-off' with distance from the airfield, and is considered to be 'Low' for the majority of the site (see Risk Map, **Annex P2**.

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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.).[16] 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

OS mapping indicates that the site area has been subject to very limited development in the post-war era. The site largely retains its open and undeveloped agricultural outlay. The only discernible development took place within the northern and eastern sections of the site during the late-1960's and early 1970's, in which a segment of the M40 motorway and associated slip roads were constructed.

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] *CIRIA C681*

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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 Aerial Delivered Ordnance

Since an aerial 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.

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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 Aerial 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	
Direct Impact	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.
Re- starting the Clock	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.
Friction Impact	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.

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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.

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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.

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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 Within the North-Western Section of the Site

1st Line Defence has assessed that there is a **Medium Risk** from German and anti-aircraft unexploded ordnance, as well as a **Medium Risk** from Allied unexploded ordnance within the north-western section of the site. See a risk map of the site area presented within **Annex P3.**

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

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19.3. Assessed Risk Level Within the Remainder of the Site

1st Line Defence has assessed that there is a **Low Risk** from German and anti-aircraft unexploded ordnance as well as a **Low Risk** from Allied unexploded ordnance within the remainder of the site proposed works. See a risk map of the site area presented within **Annex P3.**

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

Please note – although the risk from unexploded ordnance within certain areas of the site has been assessed as 'Low', this does not mean there is 'no' risk of encountering UXO. 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.

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20. Proposed Risk Mitigation Methodology

20.1. General

The following risk mitigation measures are recommended to support the proposed works at RAF Heyford, Oxfordshire:

Type of Work	Recommended Mitigation Measure
All Works	• **UXO Risk Management Plan** 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 1st Line Defence for help/more information. • **Site Specific UXO Awareness Briefings to all personnel conducting intrusive works.** 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.
Shallow Intrusive Works/Open Excavations in Medium Risk Areas	• **A Non-Intrusive UXO Magnetometer Survey** 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 recommended. • **Unexploded Ordnance (UXO) Specialist Presence on Site to support shallow intrusive works** When on site the role of the UXO Specialist would include: • 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. • 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. • To aid incident management which would involve liaison with the local authorities and police should ordnance be identified and present an explosive hazard.
Borehole/Piles in Medium Risk Areas	• **Intrusive Magnetometer Survey of all borehole and pile locations down to a maximum bomb penetration depth:** 1st Line Defence can deploy a range of intrusive magnetometer techniques to clear pile locations. The appropriate technique is influenced by a number of factors, but most importantly the site's ground conditions. The appropriate survey methodology would be confirmed once the enabling works have been completed.

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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 **24/08/2021**

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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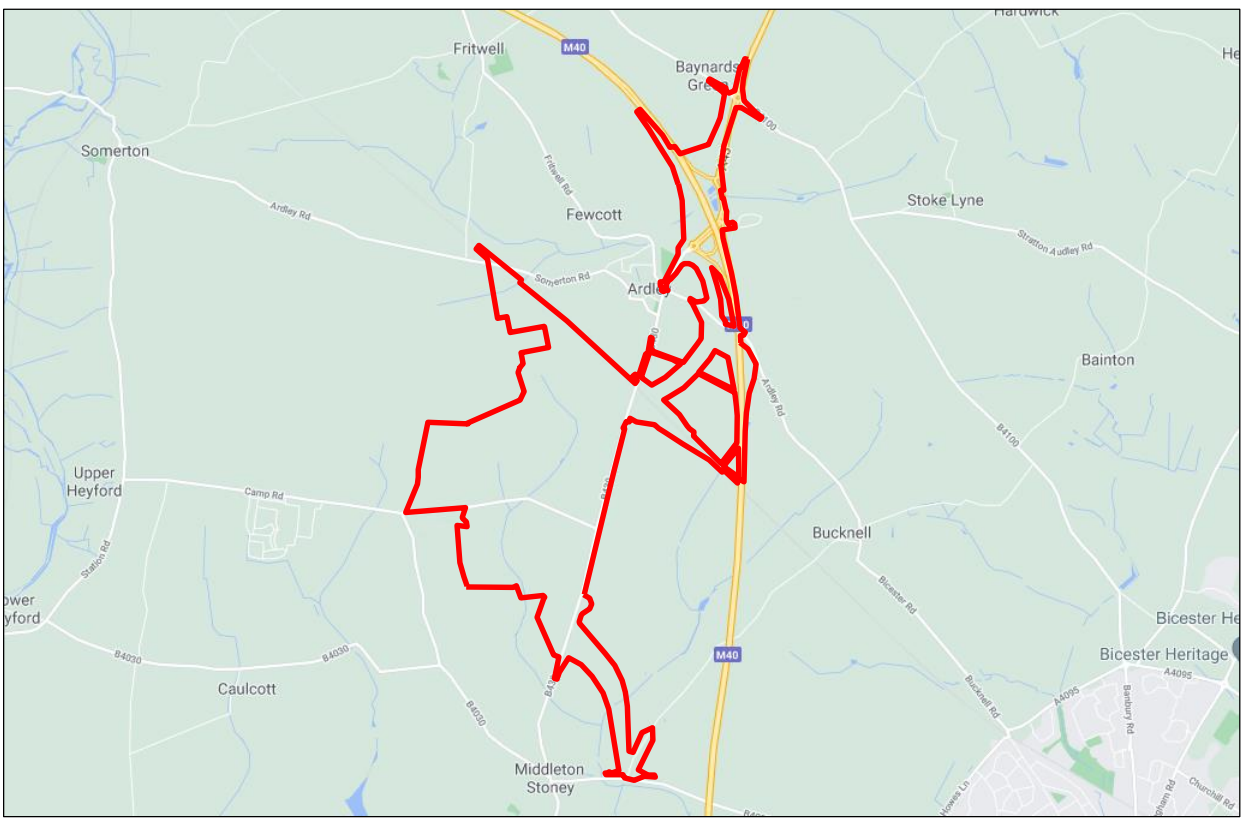
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Site Location Maps

Annex: **A**





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Client: **BWB Consulting Limited**

Approximate site boundary

N

Project: **RAF Heyford**

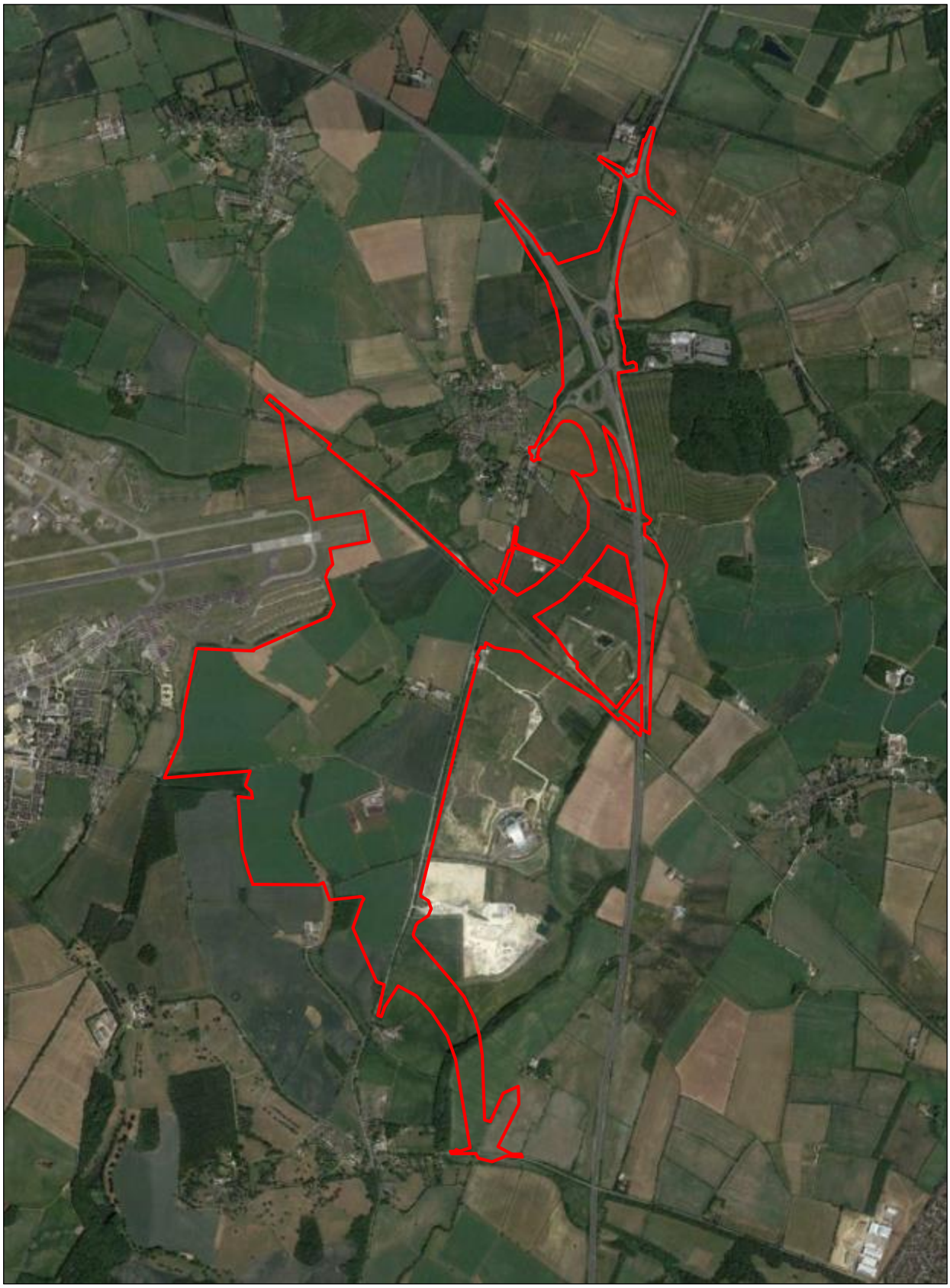
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Recent Aerial Photography

Annex: **B**



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Approximate site boundary

Project: **RAF Heyford**

N

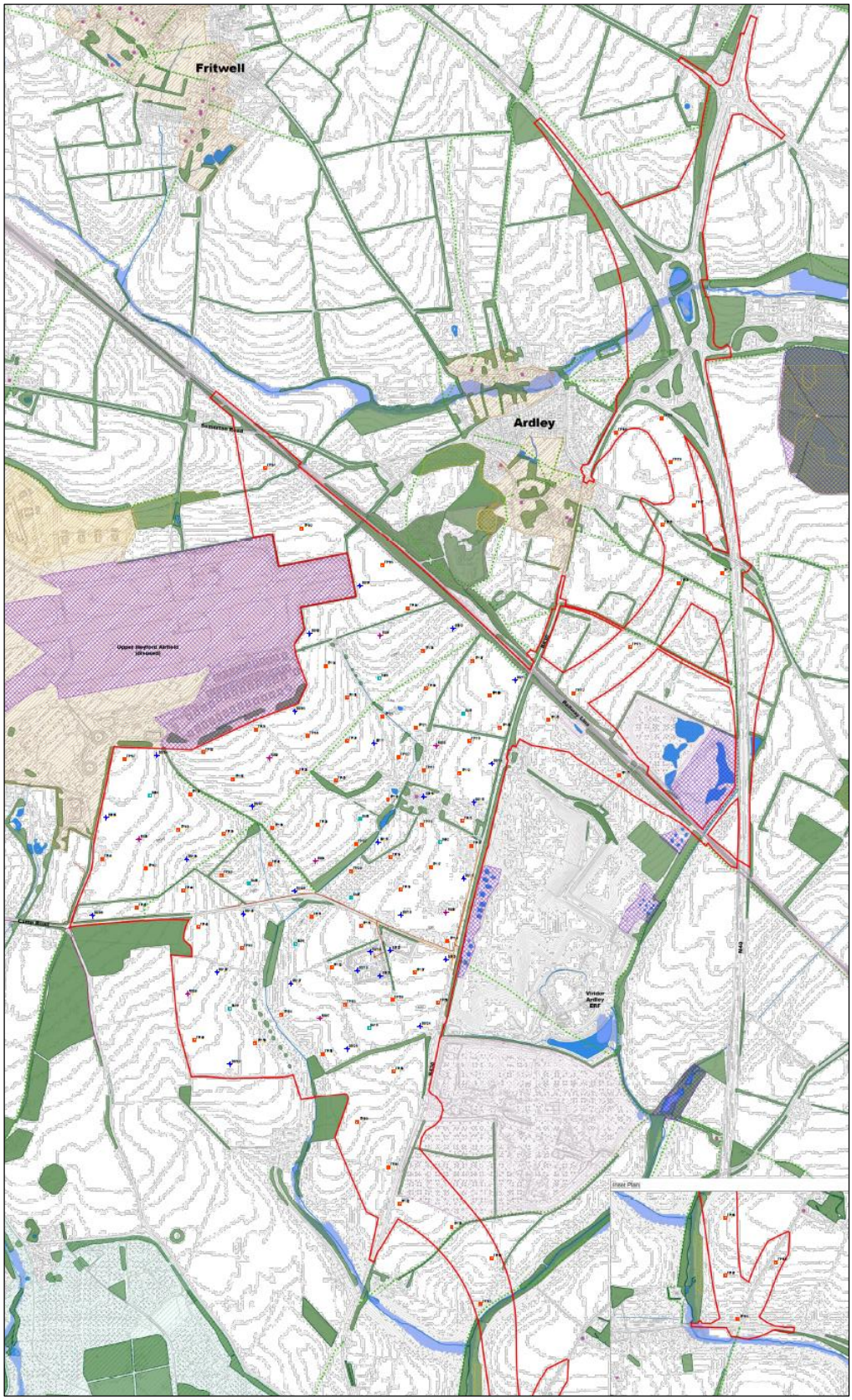
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Client Provided Site Plan

Annex: **C**

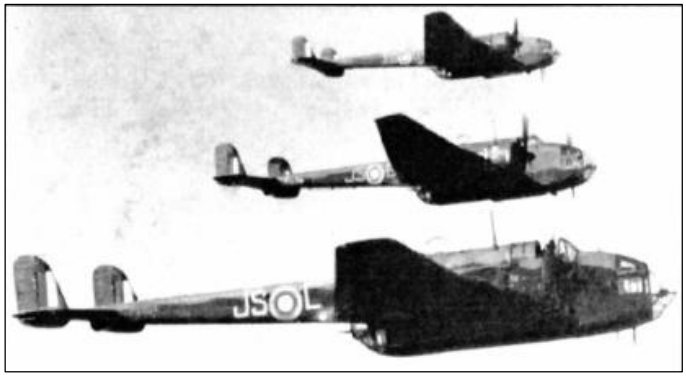


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Client:	**BWB Consulting Limited**	**Approximate site boundary**	N
Project:	**RAF Heyford**		
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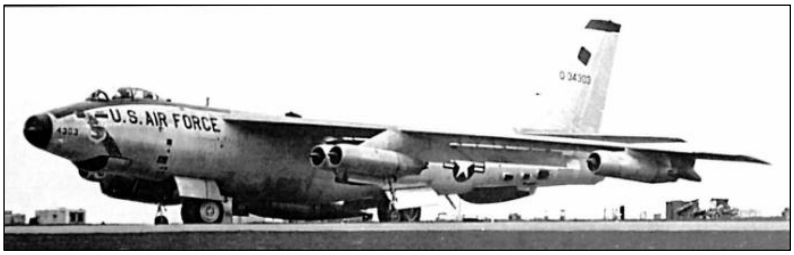


(Above) Handley-Page Hampden Mk.1's of 16 OTU Squadron, the nearest aircraft P5304 was later converted to a torpedo bomber.

RAF Upper Heyford was conceived during WWI and used as a base to train bomber crews before being assigned to their respective units. The airfield was also used throughout the inter-war period to develop new long-range navigational equipment for aircraft, and its aircraft were used to test the effectiveness of the new radar stations.

With the outbreak of WWII the 70 Bomber Wing was formed at the airfield being equipped with Handley-Page Hampdens, Avro Ansons and later Vickers Wellingtons. Upper Heyford was mostly used as an Operational Training Unit of Bomber Command, which was tasked with training bomber crews whilst also participating in major raids over occupied Europe.

As WWII ended and the Cold war began, the USAF leased the airfield from the Ministry of Defence as part of the NATO (North Atlantic Treaty Organization) alliance in 1952, as well as three other airfields in the west of England; Brize Norton, Fairford and Greenham Common. Upper Heyford was given new runways, aprons and hard standings, as well as 170 new buildings such as the innovative nose-docking sheds that allowed maintenance of the new generation of US bombers, high off the ground.



(Above) A USAF B47 bomber 0-34303 of USAF Strategic Air Command based at Upper Heyford.



(Above) A USAF RF-101C interceptor of the 20th Tactical Fighter Wing being refuelled at Upper Heyford.

The USAF's Strategic Air Command (SAC) stationed B-47 bombers at Upper Heyford, which remained until 1965. Upper Heyford was also used by reconnaissance aircraft that gathered intelligence on Soviet radar and communications, and helped monitor Soviet nuclear tests. Air sampling was undertaken at very high altitudes over test sites to see what could be learned about the latest Soviet weapons.

The 66th Tactical Reconnaissance Wing (TRW) took up residence with the RF-101C "Voodoo" until 1969. By the mid-1970's, the F-100's of the 20th Tactical Fighter Wing (TFW) arrived, but were replaced soon after by the F-111E, "Aardvark". Subsequent squadrons of EF-111A "Raven" were stationed at Upper Heyford and used in conjunction with their strike aircraft counterparts on bombing raids on Libya in 1986 and Iraq in 1991 as part of Operation Desert Storm.



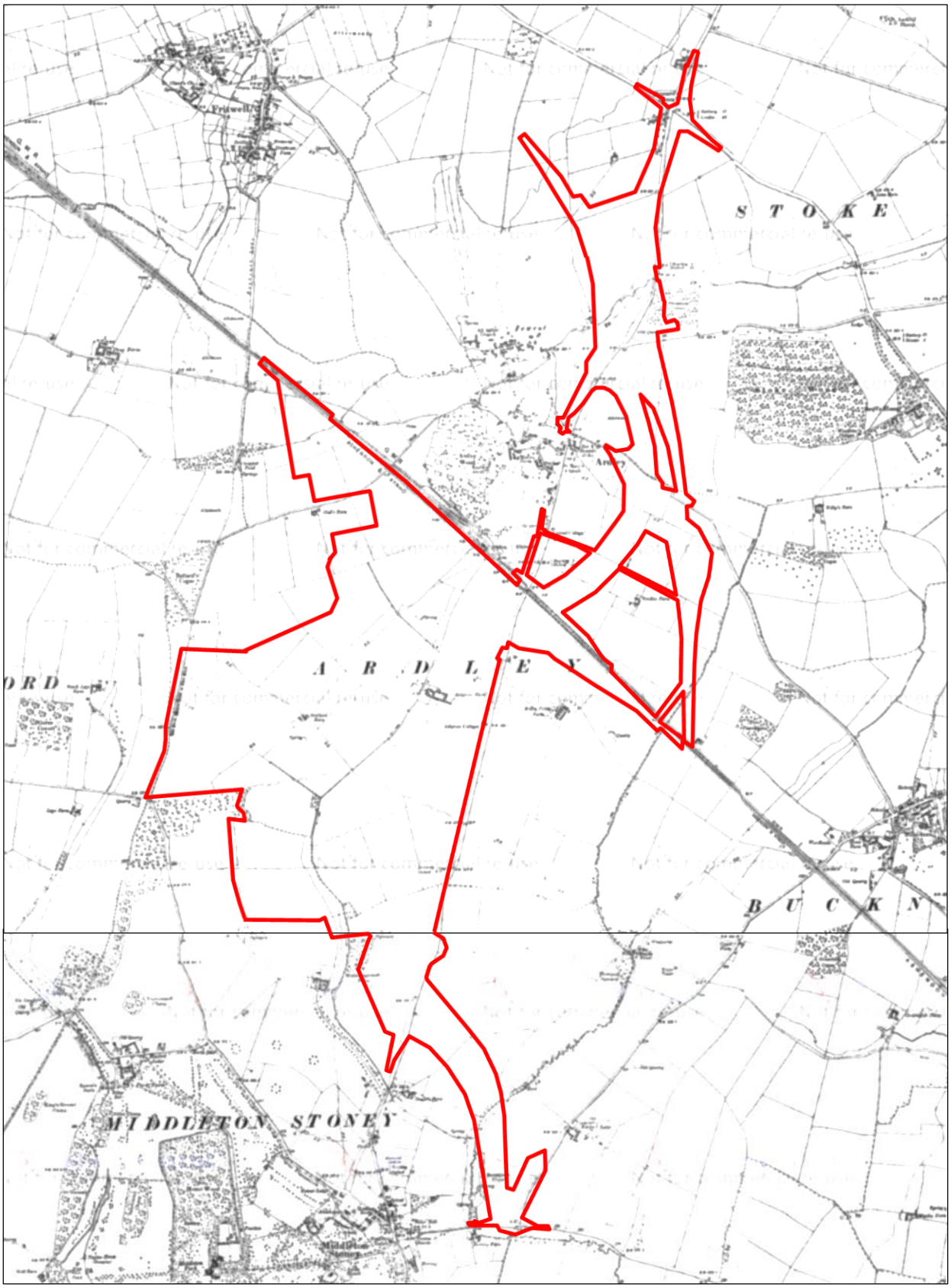
(Above) A line of USAF F-111E 'Aardvark' multirole strike aircraft of the 20th Tactical Fighter Wing carrying the UH tail code for Upper Heyford.

The collapse of the USSR led to a US demobilisation of several airbases within the UK, and brought US occupancy and operations at Upper Heyford to a close in 1994.

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Pre-WWII Historical Map 1923

Annex: **E1**



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Approximate site boundary

Project: **RAF Heyford**

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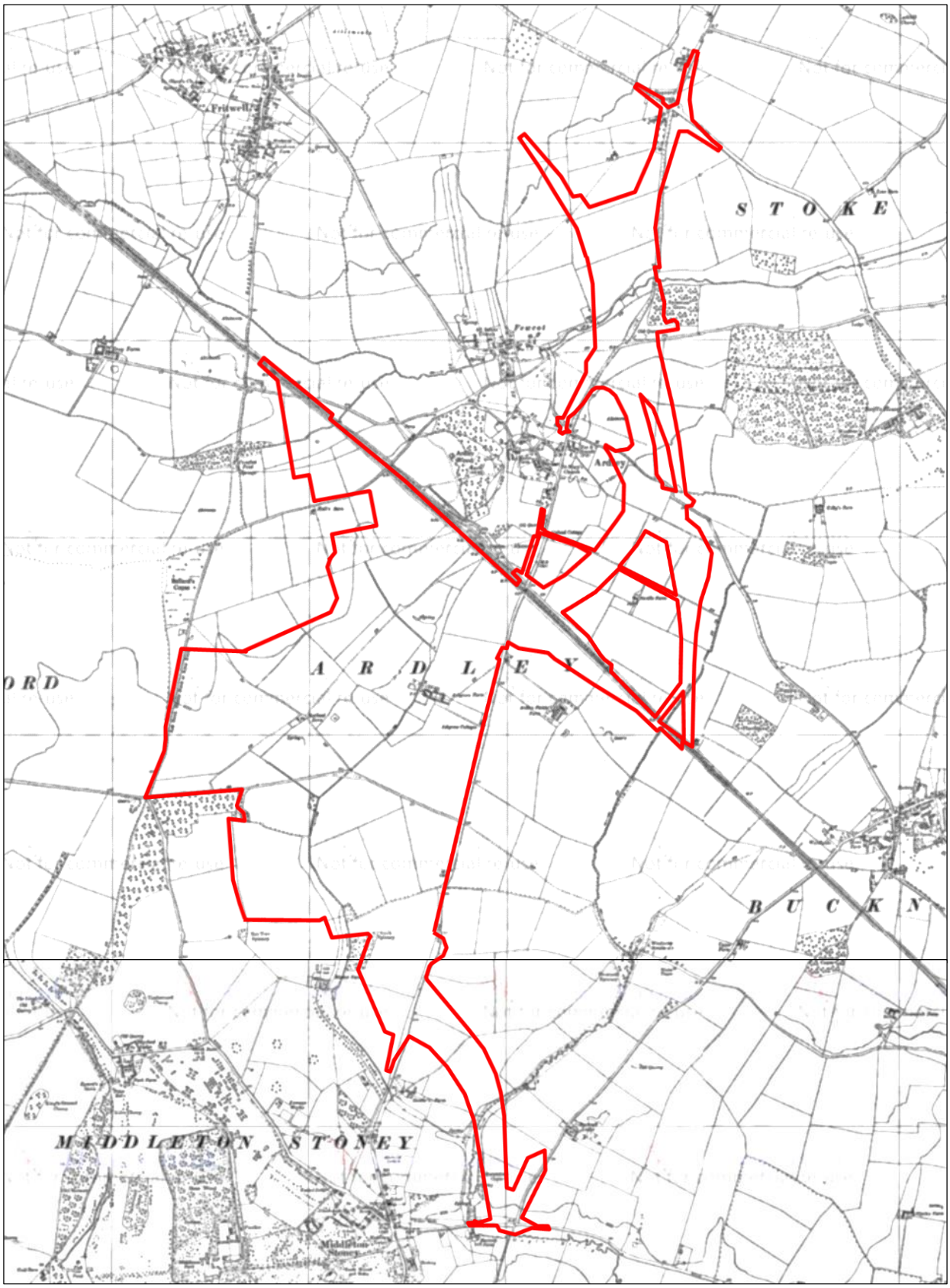
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Post-WWII Historical Map 1955

Annex: **E2**



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Approximate site boundary

Project: **RAF Heyford**

N

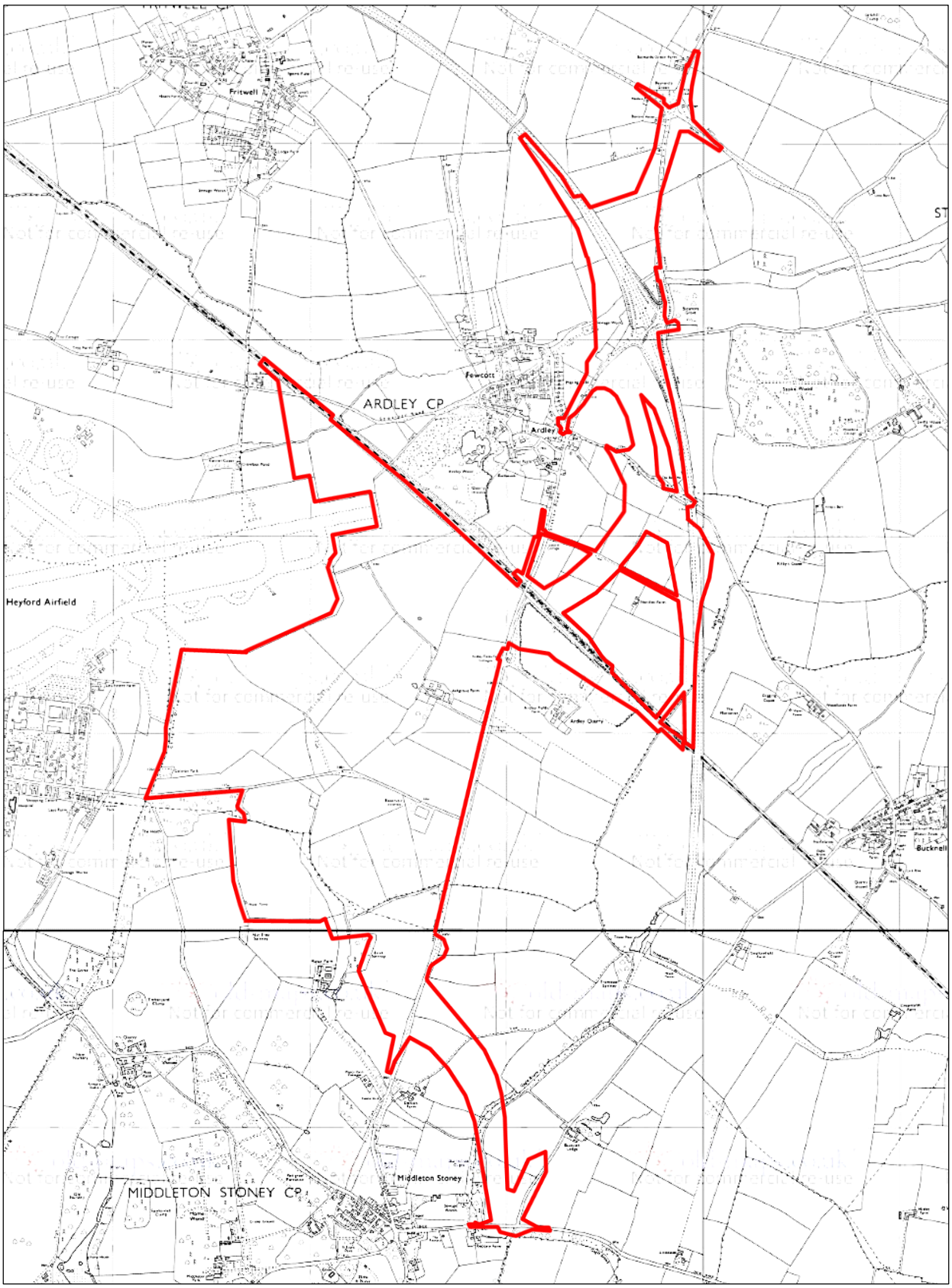
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Source: Landmark Maps

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Post-WWII Historical Map 1979 - 1993

Annex: **E3**



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Essex Road, Hoddesdon,
Hertfordshire. EN11 0EX
Email: info@1stlinedefence.co.uk
Tel: +44 (0)1992 245 020

Client: **BWB Consulting Limited**

Project: **RAF Heyford**

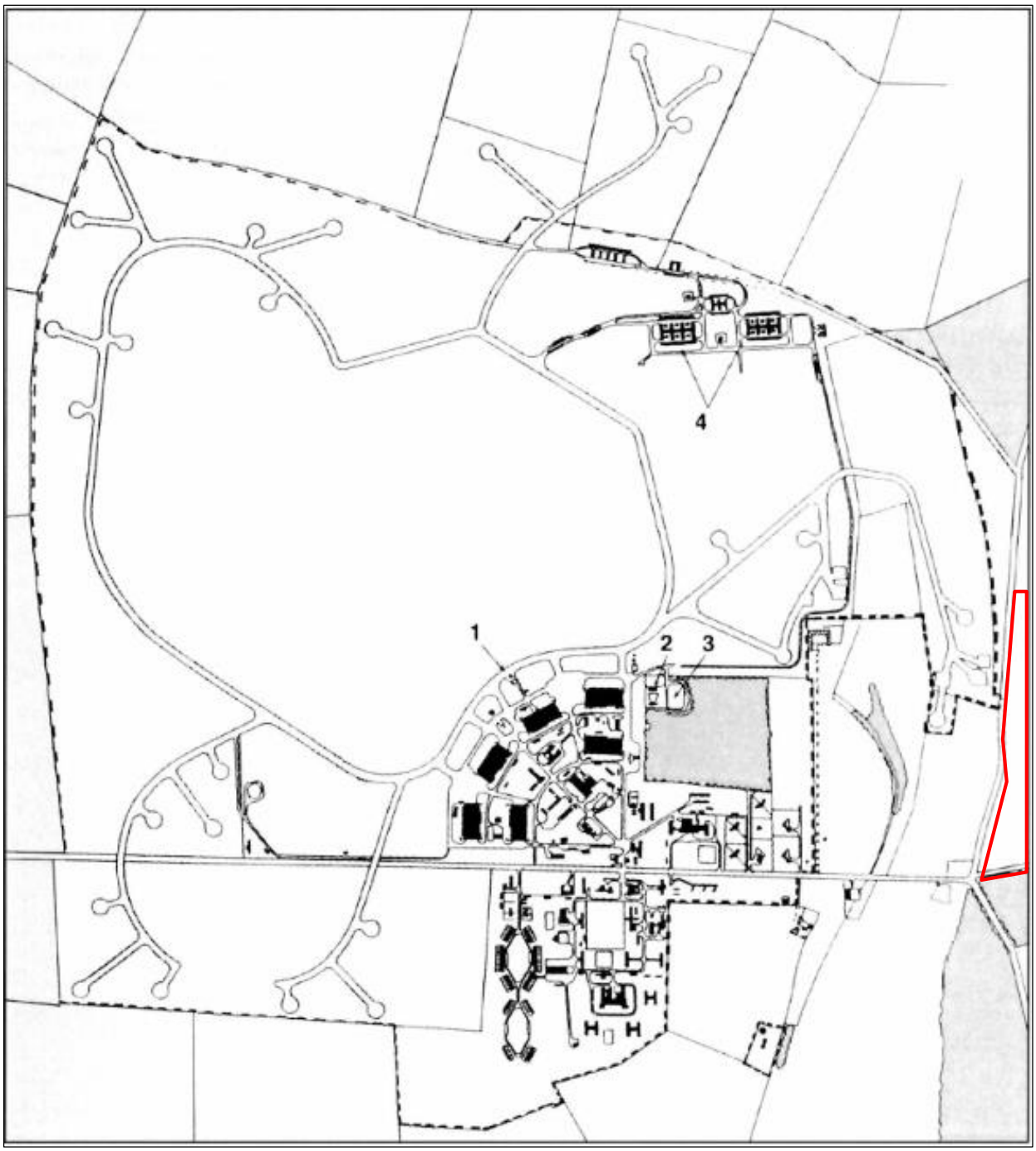
Ref: **DA13850-00**

Source: Landmark Maps

Approximate site boundary

N

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Upper Heyford 1942 – Showing the perimeter track and early 'frying pan' dispersals.

1. Flying Control
2. Machine Gun Range
3. Bulk Fuel Tanks
4. Bomb Dump

1ST LINE DEFENCE

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Hertfordshire. EN11 0EX
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Tel: +44 (0)1992 245 020

Client: **BWB Consulting Limited**

Project: **RAF Heyford**

Ref: **DA13850-00**

Source: Airfield Focus: Upper Heyford

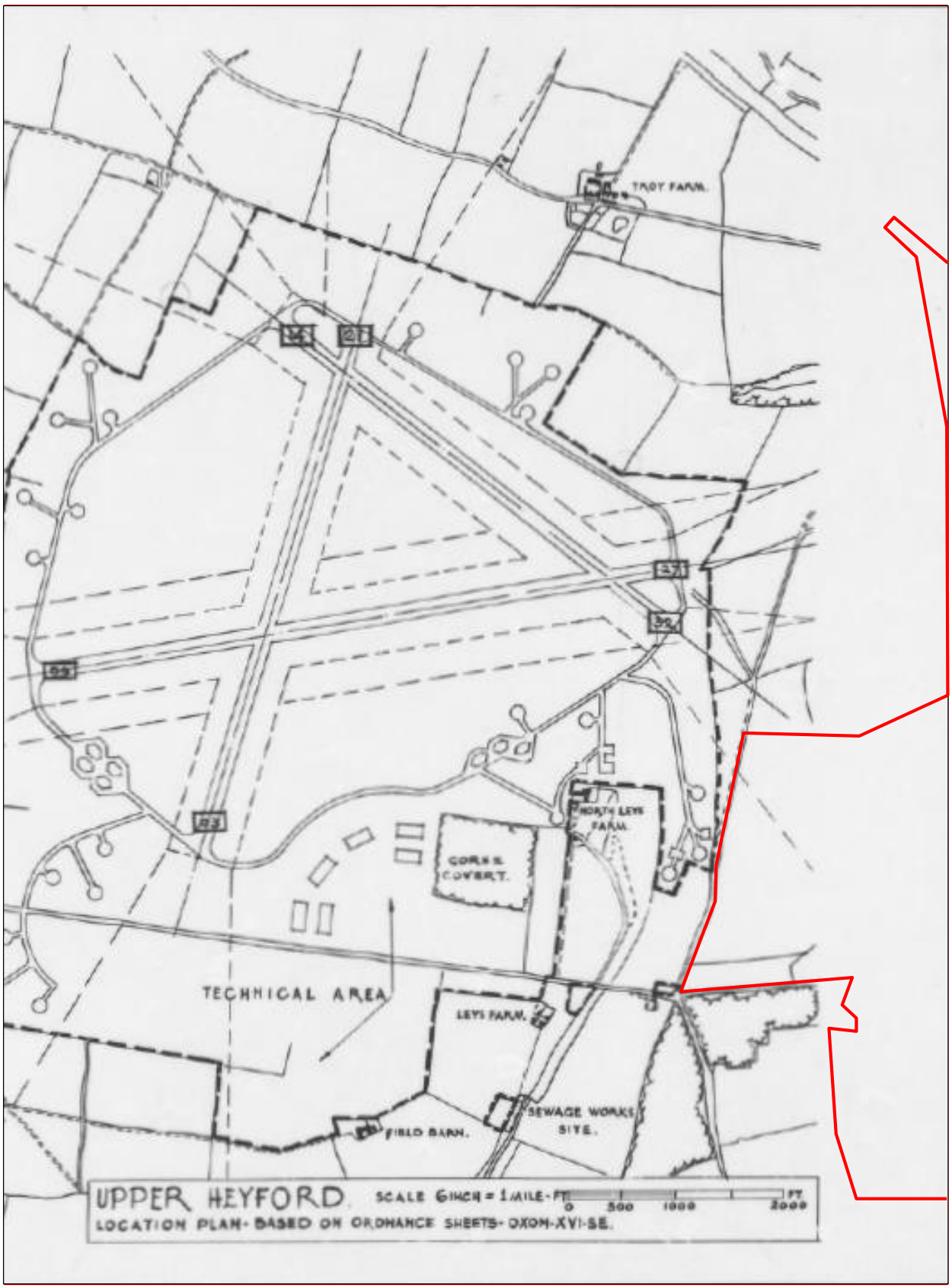
Approximate site boundary

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WWII-era RAF Site Plans 1945

Annex: **F2**



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Client: **BWB Consulting Limited**

Approximate site boundary

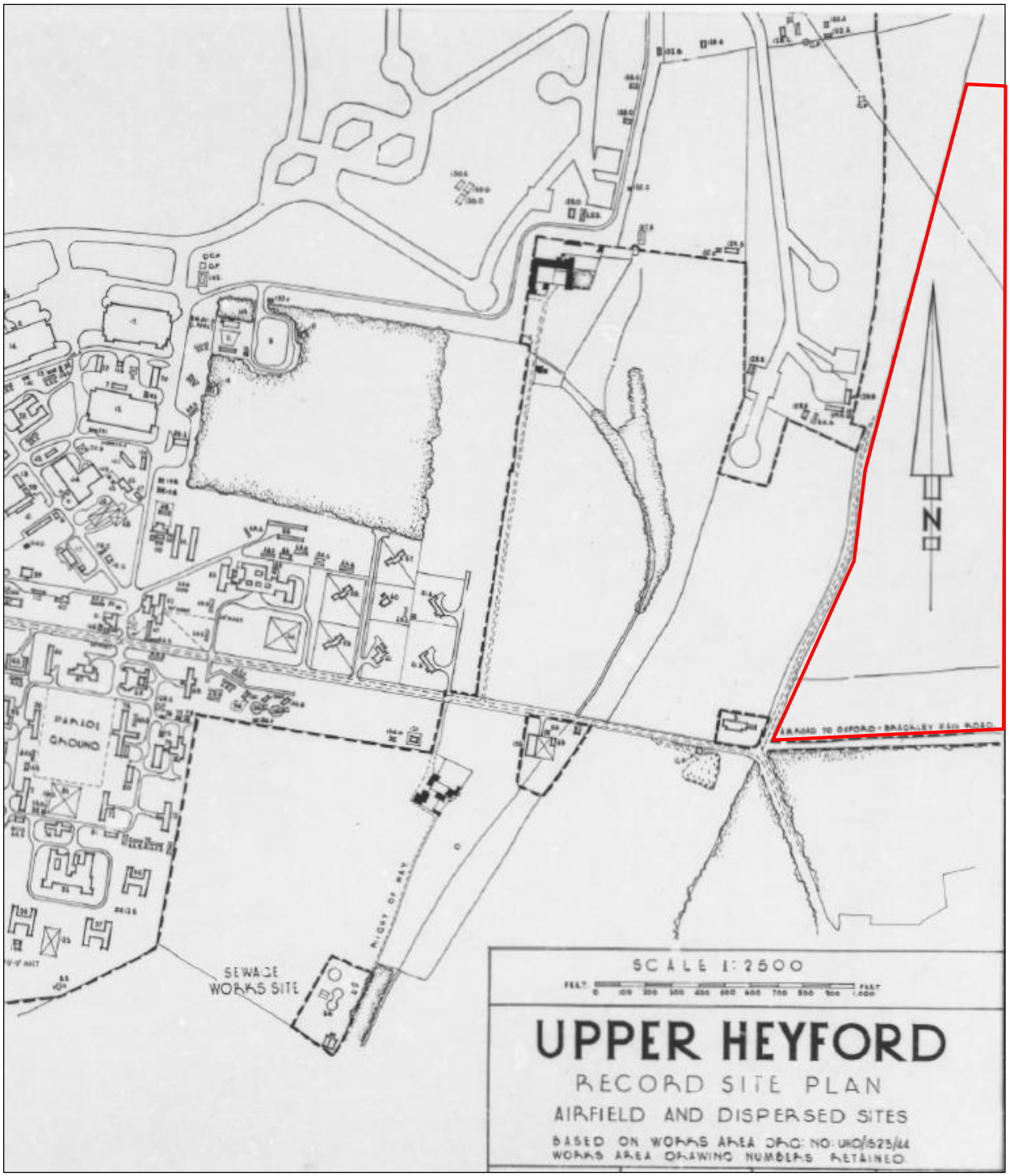
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Project: **RAF Heyford**

Ref: **DA13850-00**

Source: RAF Hendon

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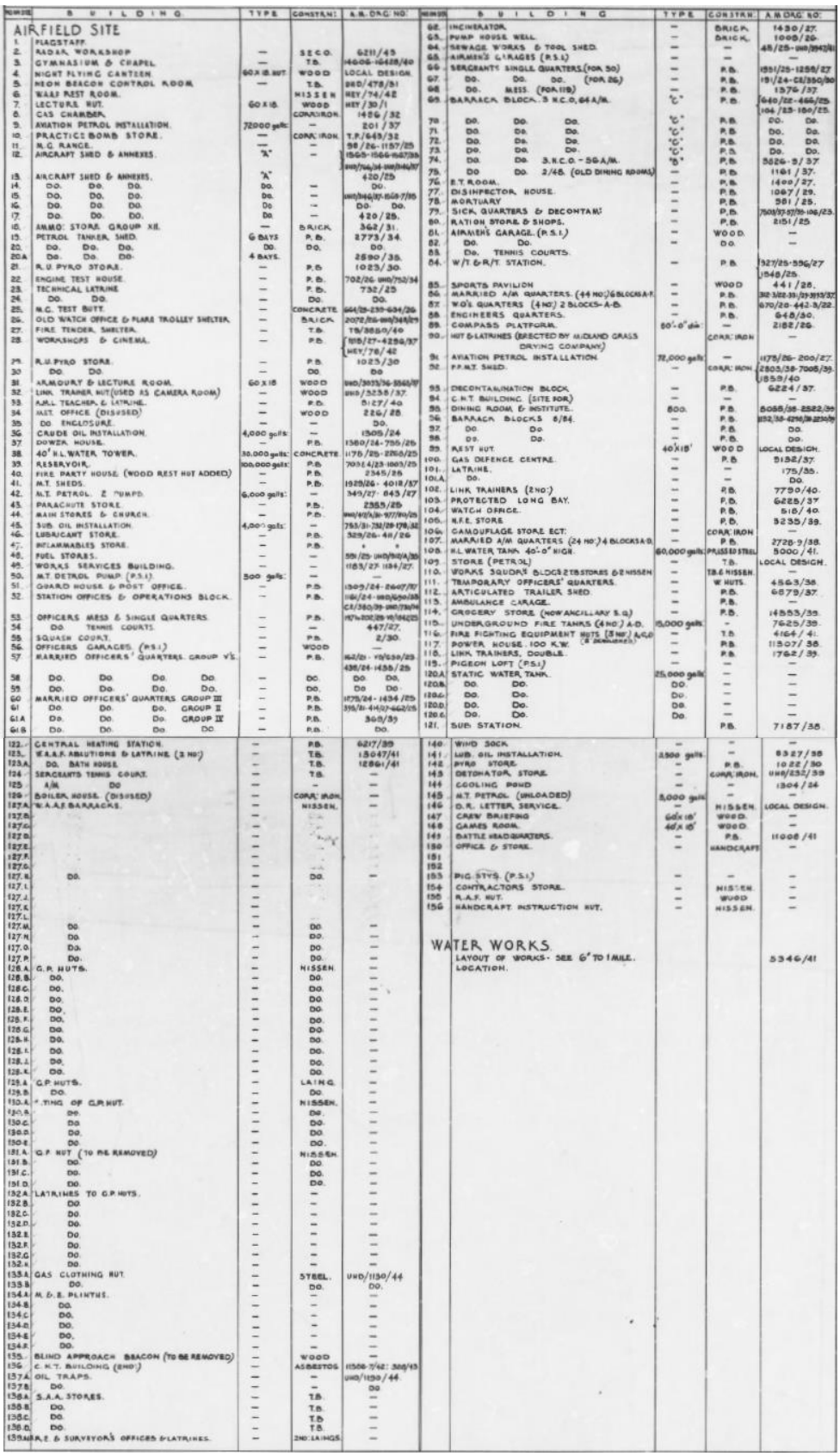
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Project: **RAF Heyford**

Ref: **DA13850-00**

Source: RAF Hendon

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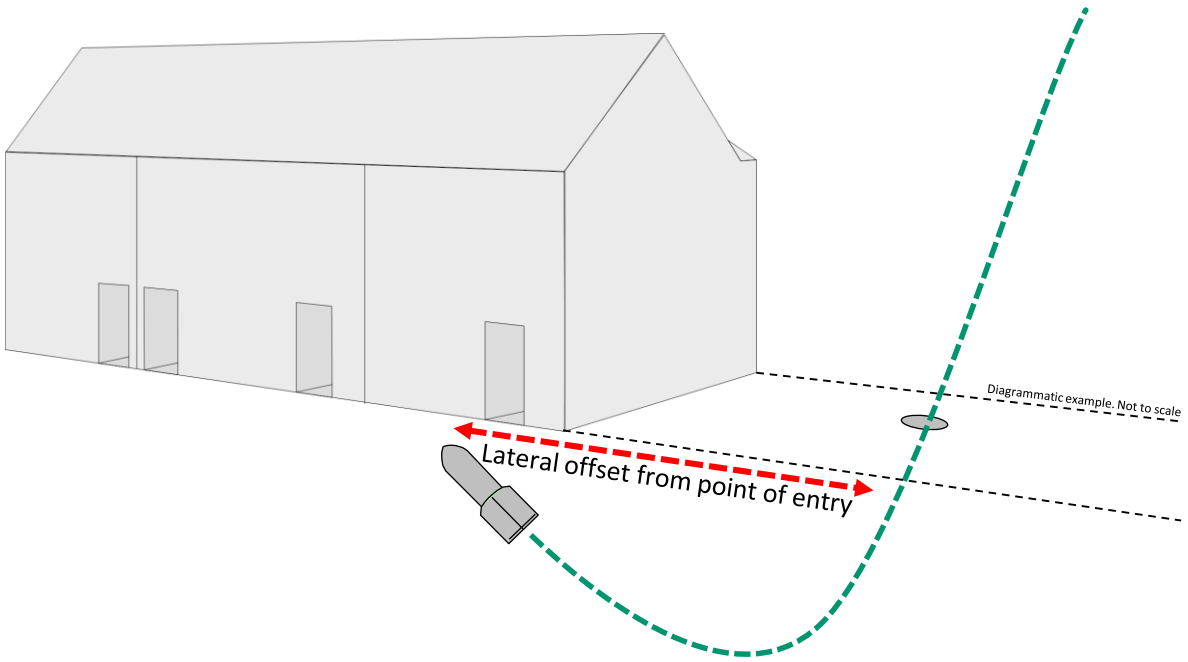


NUMBER	BUILDING	TYPE	CONSTRN.	A.M. DRG. NO.
	AIRFIELD SITE			
1.	FLAGSTAFF.			
2.	RADAR WORKSHOP	—	S.E.C.O.	9211/43
3.	GYMNASIUM & CHAPEL	—	T.B.	14006-10428/40
4.	NIGHT FLYING CANTEEN	60'X 18' HUT	WOOD	LOCAL DESIGN.
5.	HIGH BEACON CONTROL ROOM	—	T.B.	980/478/31
6.	WAAF REST ROOM.		HISSEN	HEY/74/42
7.	LECTURE HUT.	60 X 18.	WOOD	HEY/30/1
8.	GAS CHAMBER.		CORRUGATED IRON	1426/32
9.	AVIATION PETROL INSTALLATION.	72000 gals:	—	201/37
10.	PRACTICE BOMB STORE.	—	CORR. IRON	T.P./643/32
11.	M.G. RANGE.	—	—	98/26-1157/25
12.	AIRCRAFT SHED & ANNEXES.	"A"	—	1565-1566-1567/36
13.	AIRCRAFT SHED & ANNEXES.	"A"		420/25
14.	DO. DO. DO.	DO.	—	DO.
15.	DO. DO. DO.	DO.	—	
16.	DO. DO. DO.	DO	—	DO. DO.
17.	DO. DO. DO.	DO	—	420/25.
18.	AMMO: STORE. GROUP XII.	—	BRICK.	362/31.
19.	PETROL TANKER. SHED.	6 BAYS	P.B.	2773/34.
20.	DO. DO. DO.	DO.	DO.	DO.
20A	DO. DO. DO.	4 BAYS.		2890/35.
21.	R.U. PYRO STORE.	—	P.B.	1023/30.
22.	ENGINE TEST HOUSE.	—	P.B.	702/26
23.	TECHNICAL LATRINE.	—	P.B.	732/25
24.	DO. DO.	—	DO.	DO.
25.	M.G. TEST BUTT.	—	CONCRETE	
26.	OLD WATCH OFFICE & FLARE TROLLEY SHELTER.	—	BRICK.	
27.	FIRE TENDER. SHELTER.	—	T.B.	19/3850/40
28.	WORKSHOPS & CINEMA.	—	P.B.	
29.	R.U. PYRO STORE.	—	P.B.	1023/30
30	DO. DO.	—	DO.	DO
31.	ARMOURY & LECTURE ROOM.	60 X 18	WOOD	
32.	LINK TRAINER HUT (USED AS CAMERA ROOM)	—	WOOD	
33.	A.M.L. TEACHER & LATRINE.	—	P.B.	5127/40
34.	M.T. OFFICE. (DISUSED)	—	WOOD	226/28.
35.	DO. ENCLOSURE.	—	—	DO.
36.	CRUDE OIL INSTALLATION.	4,000 gals:	—	1500B/24
37.	DOWZIL HOUSE.	—	P.B.	1380/24-755/25
38.	40' H.L. WATER TOWER.	30,000 gals:	CONCRETE	1176/25-2260/25
39.	RESERVOIR.	100,000 gals:	P.B.	
40.	FIRE PARTY HOUSE. (WOOD REST HUT ADDED)	—	P.B.	2545/25
41.	M.T. SHEDS.	—	P.B.	1925/26 - 4018/37
42.	M.T. PETROL. & "PUMPS.	6,000 gals:	—	349/27 - 643/37
43.	PARACHUTE STORE.	—	P.B.	2355/25
44.	MAIN STORES & CHURCH.	—	P.B.	
45.	SUB. OIL INSTALLATION.	4,000 gals:	—	755/31-752/29-178/32
46.	LUBRICANT STORE.	—	P.B.	329/26-48/26
47.	INFLAMMABLES STORE.	—	P.B.	" "
48.	FUEL STORES.	—	—	551/25-1140/39/A/35
49.	WORKS SERVICES BUILDING.	—	—	1183/27-1184/27.
50.	M.T. DETROL PUMP. (P.S.I.)	500 gals:	—	—
51.	GUARD HOUSE & POST OFFICE.	—	P.B.	1309/24-2607/37
52.	STATION OFFICES & OPERATIONS BLOCK.	—	P.B.	
53.	OFFICERS MESS & SINGLE QUARTERS.	—	P.B.	
54.	DO TENNIS COURTS.	—	—	447/27.
55.	SQUASH COURT.	—	P.B.	2/30.
56.	OFFICERS GARAGES. (P.S.I.)	—	WOOD	—
57.	MARRIED OFFICERS' QUARTERS. GROUP V'S	—	P.B.	
58	DO. DO. DO. DO.	—	DO.	DO. DO.
59	DO. DO. DO. DO.	—	DO.	DO DO
60	MARRIED OFFICERS' QUARTERS. GROUP III	—	P.B.	1275/24 - 1434/25
61	DO. DO. DO. GROUP II	—	P.B.	
61A	DO. DO. DO. GROUP IV	—	P.B.	360/35
61B	DO. DO. DO. DO.	—	P.B.	DO.
122.	CENTRAL HEATING STATION.	—	P.B.	6217/39
123.	W.A.A.F. ABLUTIONS & LATRINE. (3 NO)	—	T.B.	13047/41
123A.	DO. BATH HOUSE.	—	T.B.	12861/41
124	SERGEANTS TENNIS COURT.	—	T.B.	—
125	A.M. DO	—	—	—
126	BOILER HOUSE. (DISUSED)	—	CORR. IRON.	—
127A	W.A.A.F. BARRACKS.	—	NISSEN.	—
127B.		—		
127C.		—		
127D.		—		
127E.		—		
127F.		—		
127G.		—		
127.H.	DO.	—	DO.	—
127.I.		—		
127.J.		—		
127.K.		—		
127.L.		—		
127.M.	DO.	—	DO.	—
127.N.	DO.	—	DO.	—
127.O.	DO.	—	DO.	—
127.P.	DO.	—	DO.	—
128.A.	G.P. HUTS.	—	NISSEN.	—
128.B.	DO.	—	DO.	—
128.C.	DO.	—	DO.	—
128.D.	DO.	—	DO.	—
128.E.	DO.	—	DO.	—
128.F.	DO.	—	DO.	—
128.G.	DO.	—	DO.	—
128.H.	DO.	—	DO.	—
128.I.	DO.	—	DO.	—
128.J.	DO.	—	DO.	—
128.K.	DO.	—	DO.	—
128.A.	G.P. HUTS.	—	LAING.	—
129.B.	DO.	—	DO.	—
130.A.	SITING OF G.P. HUT.	—	NISSEN.	—
130.B.	DO.	—	DO.	—
130.C.	DO.	—	DO.	—
130.D.	DO.	—	DO.	—
130.E.	DO.	—	DO.	—
131.A.	G.P. HUT (TO BE REMOVED)	—	NISSEN.	—
131.B.	DO.	—	DO.	—
131.C.	DO.	—	DO.	—
131.D.	DO.	—	DO.	—
132.A.	LATRINES TO G.P. HUTS.	—	—	—
132.B.	DO.	—	—	—
132.C.	DO.	—	—	—
132.D.	DO.	—	—	—
132.E.	DO.	—	—	—
132.F.	DO.	—	—	—
132.G.	DO.	—	—	—
132.H.	DO.	—	—	—
133.A.	GAS CLOTHING HUT.	—	STEEL.	UHD/1130/44
133.B.	DO.	—	DO.	DO.
134.A.	M.D.E. PLINTHS.	—	—	—
134.B.	DO.	—	—	—
134.C.	DO.	—	—	—
134.D.	DO.	—	—	—
134.E.	DO.	—	—	—
134.F.	DO.	—	—	—
135.	BLIND APPROACH BEACON (TO BE REMOVED)	—	WOOD	—
136.	C.H.T. BUILDING (END)	—	ASBESTOS	11508-7/42: 360/43
137.A.	OIL TRAPS.	—	—	UHD/1130/44
137.B.	DO.	—	—	DO
138.A.	S.A.A. STORES.	—	T.B.	—
138.B.	DO.	—	T.B.	—
138.C.	DO.	—	T.B.	—
138.D.	DO.	—	T.B.	—
139.	A.R.P. & SURVEYOR'S OFFICES & LATRINES.	—	2ND. LAING'S.	—

NUMBER	BUILDING	TYPE	CONSTRN.	A.M. DRG. NO.
68.	INCINERATOR.	—	BRICK.	1430/37.
69.	PUMP HOUSE. WELL.	—	BRICK.	1005/39.
84.	SEWAGE WORKS & TOOL SHED.	—	—	48/25-998/39
65.	AIRMEN'S GARAGES (P.S.I.)	—	—	—
66.	SERGEANTS SINGLE QUARTERS (FOR 50)	—	P.B.	1551/25-1258/27
67.	DO. DO. DO. (FOR 26)	—	P.B.	19/24-CE/350/30
68.	DO. MESS. (FOR 119)	—	P.B.	1376/37
69.	BARRACK BLOCK. 3 N.C.O. 64 A/M.	'C'	P.B.	640/22-466/25
70.	DO. DO. DO.	'C'	P.B.	DO. DO.
71.	DO. DO. DO.	'C'	P.B.	DO. DO.
72.	DO. DO. DO.	'C'	P.B.	DO. DO.
73.	DO. DO. DO.	'C'	P.B.	DO. DO.
74.	DO. DO. 3 N.C.O. - 56 A/M.	'D'	P.B.	3826-3/37
75.	DO DO 2/45. (OLD DINING ROOMS)	—	P.B.	1101/37.
76.	E.T. ROOM.	—	P.B.	1400/27.
77.	DISINFECTOR HOUSE.	—	P.B.	1067/29.
78.	MORTUARY	—	P.B.	581/25.
79.	SICK QUARTERS & DECONTAM:	—	P.B.	
80.	RATION STORE & SHOPS.	—	P.B.	2151/25
81.	AIRMEN'S GARAGE. (P.S.I.)	—	WOOD.	—
82.	DO. DO.	—	DO.	—
83.	DO. TENNIS COURTS.			
84.	W/T & R/T. STATION.	—	P.B.	
85.	SPORTS PAVILION	—	WOOD	441/28.
86.	MARRIED A/M QUARTERS. (44 NO:) 6 BLOCKS A-F.	—	P.B.	
87.	W.O.'S QUARTERS (4 NO:) 2 BLOCKS- A-B.	—	P.B.	
88.	ENGINEERS QUARTERS.	—	P.B.	648/30.
89.	COMPASS PLATFORM.	50'-0" dia	—	2182/26.
90.	HUT & LATRINES (ERECTED BY MIDLAND GRASS DRYING COMPANY)		CORR. IRON	—
91.	AVIATION PETROL INSTALLATION.	72,000 gals	—	
92.	P.P.M.T. SHED.	—	CORR. IRON	
93.	DECONTAMINATION BLOCK.	—	P.B.	6224/37.
94.	C.H.T. BUILDING. (SITE FOR)	—	—	—
95.	DINING ROOM & INSTITUTE.	800.	P.B.	
96.	BARRACK BLOCKS 8/84.	—	P.B.	
97.	DO. DO.	—	P.B.	DO.
98.	DO. DO.	—	P.B.	DO.
99.	REST HUT.	40'X18'	WOOD	LOCAL DESIGN.
100.	GAS DEFENCE CENTRE.	—	P.B.	5132/37.
101.	LATRINE.	—	—	175/35.
101A	DO.	—	—	DO.
102.	LINK TRAINERS (2 NO:)	—	P.B.	7790/40.
103.	PROTECTED LONG BAY.	—	P.B.	6225/37
104.	WATCH OFFICE.	—	P.B.	518/40.
105.	H.F.F. STORE.	—	P.B.	5235/39.
106.	CAMOUFLAGE STORE ECT:	—	CORR. IRON	—
107.	MARRIED A/M QUARTERS (24 NO:) 4 BLOCKS A-D.	—	P.B.	2728-9/38.
108.	H.L. WATER TANK 40'-0" HIGH.	60,000 gals	PRESSED STEEL	5000/41.
109.	STORE (PETROL)	—	T.B.	LOCAL DESIGN.
110.	WORKS SQUADS BLOCKS 2 & 3 STORES & 2 NISSEN	—	T.B. & NISSEN.	—
111.	TEMPORARY OFFICERS' QUARTERS.	—	W. HUTS.	4563/38.
112.	ARTICULATED TRAILER SHED	—	P.B.	6879/37.
113.	AMBULANCE GARAGE.	—	P.B.	—
114.	GROCERY STORE (NOW ANCILLARY S.Q.)	—	P.B.	14553/39.
115.	UNDERGROUND FIRE TANKS (4 NO:) A.D.	15,000 gals	—	7625/39.
116.	FIRE FIGHTING EQUIPMENT HUTS (3 NO:) A.C.D. (2 DEMOLISHED)	—	T.B.	4164/41.
117.	POWER HOUSE. 100 K.W.	—	P.B.	11307/38.
118.	LINK TRAINERS. DOUBLE.	—	P.B.	1762/39.
119.	PIGEON LOFT (P.S.I.)	—	—	—
120.A	STATIC WATER TANK.	25,000 gals	—	—
120.B.	DO. DO.	DO.	—	—
120.C.	DO. DO.	DO.	—	—
120.D.	DO. DO.	DO.	—	—
120.E.	DO. DO.	DO.	—	—
121.	SUB STATION.		P.B.	7187/38.
140.	WIND SOCK	—	—	—
141.	SUB. OIL INSTALLATION.	2500 gals.	—	8327/38
142.	PYRO STORE.	—	P.B.	1022/30
143.	DETONATOR STORE.	—	CORR. IRON.	UHD/232/39
144.	COOLING POND	—	—	1304/24
145.	M.T. PETROL (UNLOADED)	3,000 gals	—	—
146.	D.R. LETTER SERVICE.	—	NISSEN.	LOCAL DESIGN.
147.	CREW BRIEFING	60'X 18'	WOOD.	—
148.	GAMES ROOM.	60'X 18'	WOOD.	—
149.	BATTLE HEADQUARTERS.	—	P.B.	11008/41
150.	OFFICE & STORE.	—	HANDCRAFT	—
151.				
152.				
153.	PIG. STYS. (P.S.I.)	—	—	—
154.	CONTRACTORS STORE.	—	NISSEN.	—
155.	R.A.F. HUT.	—	WOOD	—
156.	HANDCRAFT INSTRUCTION HUT.	—	NISSEN.	—
	WATER WORKS.			
	LAYOUT OF WORKS - SEE 6" TO 1 MILE.			5346/41
	LOCATION.			

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Example of UXO Entry Hole / The 'J-curve' Effect Principle









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 250kg bomb found in Bermondsey 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**).

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Client: **BWB Consulting Limited**

Project: **RAF Heyford**

Ref: **DA13850-00**

Source: Various sources

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BBC NEWS

Bermondsey bomb: World War Two device safely removed



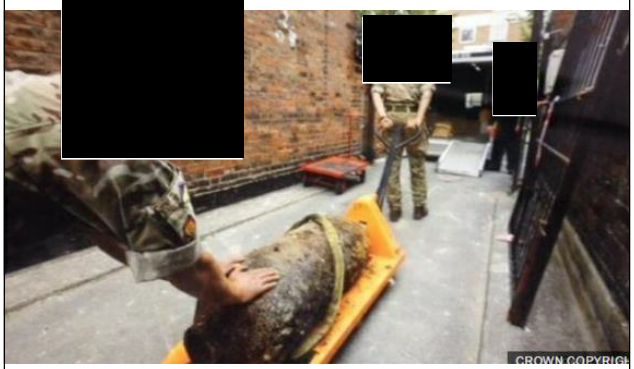
An unexploded World War Two bomb found in south London has been driven away safely under police and Army escort.

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

March 2015

BBC NEWS

Bethnal Green WW2 bomb: Experts remove unexploded device



An unexploded World War Two bomb that prompted the evacuation of 700 people in east London has been made safe and removed by the military.

Families spent the night in a school hall after the 500lb bomb was found in the basement of a building site on Temple Street, in Bethnal Green, on Monday afternoon.

A 200m (650ft) exclusion zone was set up around the device.

August 2016

BBC NEWS

Bath WW2 bomb scare: Device defused, police say



A 500lb World War Two bomb found on the site of a former school in Bath has been defused and made safe.

The discovery of the bomb on Thursday **led to the evacuation of hundreds of homes** and many road closures in the Lansdown area of the city.

A cordon around the site was lifted on Friday evening, more than 24 hours after residents were asked to leave their homes.

May 2016

BBC NEWS

London City Airport reopens after WW2 bomb moved



London City Airport has reopened after an unexploded 500kg World War Two bomb was safely moved from the area.

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

All flights were cancelled on Monday after an exclusion zone was put in place, **with the closure affecting up to 16,000 passengers and nearby residents being evacuated from their homes.**

May 2015

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Examples of Unexpected Detonation of WWII Bombs

Annex: **H2**

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, [redacted] 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."

1st March 2013

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," [redacted] 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."

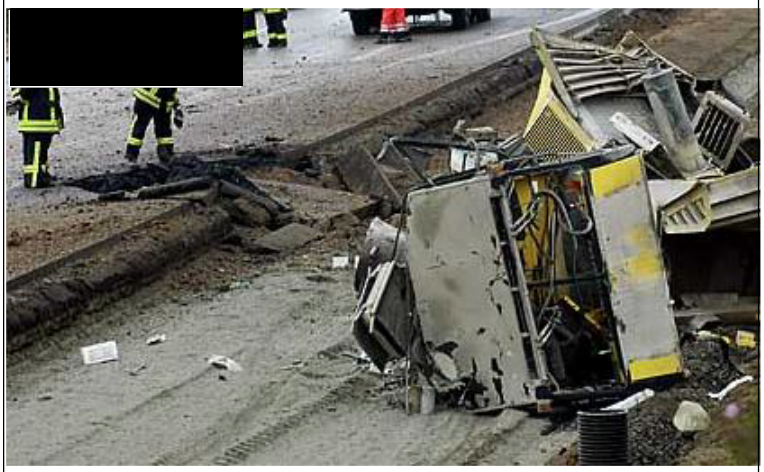
19th September 2013

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.

23rd October 2006

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 [redacted] eports 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.

2nd June 2010



June 2006

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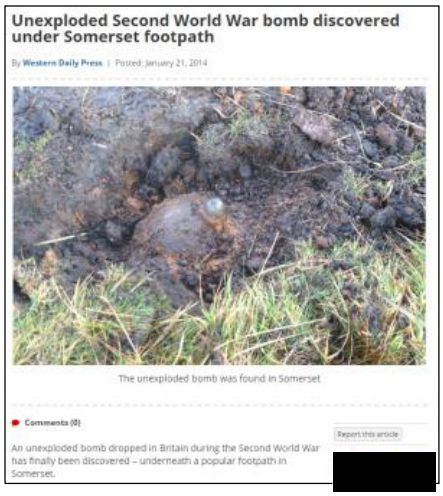
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Project:	**RAF Heyford**		
Ref:	**DA13850-00**	Source:	Various news sources

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Examples of Land Service Ammunition finds in the UK

Annex: H3



Unexploded Second World War bomb discovered under Somerset footpath

By Western Daily Press | Posted: January 21, 2014

The unexploded bomb was found in Somerset

Comments (0)

An unexploded bomb dropped in Britain during the Second World War has finally been discovered – underneath a popular footpath in Somerset.



23 August 2014 Last updated at 15:01

Unexploded WW2 bomb found at Kenfig Pool, Bridgend

Dean Smith believes the shell was made in Germany

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.

[redacted], of Pyle, was walking near Kenfig Pool on Saturday when [redacted] 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.

Related Stories

'Panic' as dog nearly thrown grenade

WW2 bomb found at wind farm exploded

WWII bomb found in kitchen cupboard



Mortar thought to be from WWII found on Oshawa's Camp-X grounds

August 24, 2016 | 5:42 am

What is believed to be a World War II mortar has been discovered in south Oshawa. A man out in Intrepid Park, the site of the Camp-X Second World War training grounds, discovered the round with his metal detector on Tuesday evening. Durham police are held the scene overnight awaiting military officials from Trenton to come and properly detonate the mortar.



Unexploded bomb found in farmer's field

17 May 2010

A live Second World War mortar shell was blown up by Army experts after a farmer found it in his field.

The discovery was made in the field alongside the A20 between Folkestone and Dover.

The mortar shell, which was around a foot long and 3in in diameter, was around 50ft from the main road.

The farmer alerted police and [redacted] sent to the field.

[redacted] contacted the Army who sent in a bomb disposal unit.

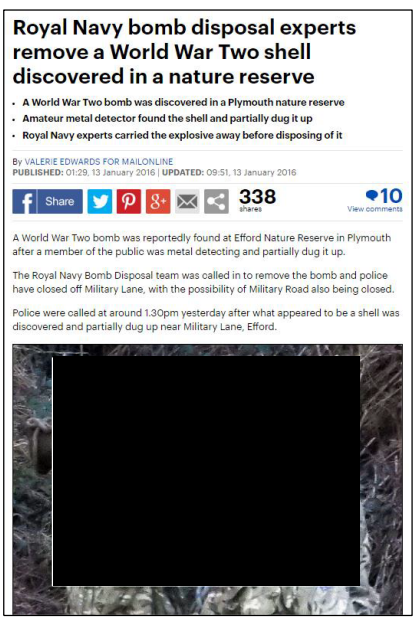
An Army officer confirmed the live shell was from the Second World War and was packed with high explosives.

They moved it a safe distance away from the A20 and carried out a controlled explosion.

[redacted] said: "Given that we live in an area that saw much action during the Second World War, it is not uncommon for us to be alerted about unexploded bombs."

The incident was on Thursday.

Click here for more news from Kent.



Royal Navy bomb disposal experts remove a World War Two shell discovered in a nature reserve

- A World War Two bomb was discovered in a Plymouth nature reserve
- Amateur metal detector found the shell and partially dug it up
- Royal Navy experts carried the explosive away before disposing of it

By VALERIE EDWARDS FOR MAILONLINE
PUBLISHED: 01:29, 13 January 2016 | **UPDATED:** 09:51, 13 January 2016

Share 338 shares 10 View comments

A World War Two bomb was reportedly found at Efford Nature Reserve in Plymouth after a member of the public was metal detecting and partially dug it up.

The Royal Navy Bomb Disposal team was called in to remove the bomb and police have closed off Military Lane, with the possibility of Military Road also being closed.

Police were called at around 1.30pm yesterday after what appeared to be a shell was discovered and partially dug up near Military Lane, Efford.



Holiday beach cordoned off after landslip sends more than a THOUSAND Second World War bombs and rockets tumbling onto the sands

- Bad weather led to ground movement which exposed the huge arsenal at Mappleton, East Riding
- A dog walker stumbled across the deadly find on Saturday and 15 controlled explosions were carried out
- Rockets, mortar bombs and 25-pounder bombs were recovered after they were fired into the cliffs by RAF aircraft during the war
- Most of the devices were dummy rounds used for bombing practice but contain enough explosives to cause terrible injuries

© Jonathan Pow

Bomb Beach Alley: Rockets were found after a landslide on Mappleton beach in 2012



Army bomb disposal team called to Blacksole Bridge in Herne Bay

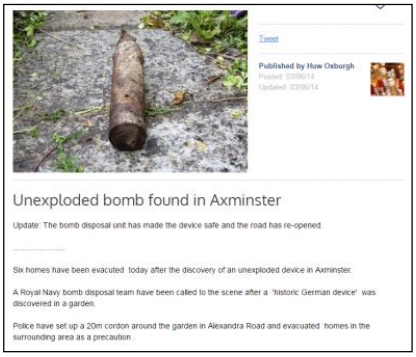
by Aidan Barlow abarlow@thekmgroup.co.uk 08 July 2015

It was like a scene from Dad's Army when Army bomb disposal experts found wartime explosives made by the Home Guard in makeshift bottles.

A team was called to the Blacksole Bridge in Herne Bay after the wartime bombs were found.

The team from the Royal Logistics Corps set up a 30 metre exclusion zone for pedestrians around the railway embankment after the suspected homemade phosphorous bombs were found.

The scene at Blacksole Bridge after wartime explosives were found in the railway cutting



Tweet

Published by Huw Oxburgh

Unexploded bomb found in Axminster

Update: The bomb disposal unit has made the device safe and the road has re-opened.

Six homes have been evacuated today after the discovery of an unexploded device in Axminster.

A Royal Navy bomb disposal team have been called to the scene after a 'historic German device' was discovered in a garden.

Police have set up a 20m cordon around the garden in Alexandra Road and evacuated homes in the surrounding area as a precaution.



Storms and floods unearth unexploded wartime bombs

By Claire Marshall
BBC environment correspondent

There has been a dramatic increase in the number of wartime bombs unearthed because of the winter storms and flooding.

Bomb disposal teams in the South West have dealt with double the number of unexploded ordnance than in the same period last year.

Since mid December, the Royal Navy's Southern Dive Unit has recovered or disposed of 244 items of ordnance.

During the same period last year, they dealt with just 108 items.

The storms have uncovered a lethal past

Almost 70 years after the end of WWII, one legacy of that conflict continues to turn up on beaches and harbours around Britain.

Unexploded shells, bombs and mines continue to be discovered every year, and the Royal Navy's Southern Dive Unit is tasked with making these devices safe.

Its area of responsibility stretches for some 2,250km (1,400 miles). It begins from the highwater mark in Hull and proceeds seaward to the territorial limit, and then runs clockwise around the British Isles - including the Isle of Wight, Channel Islands, and Isles of Scilly - to finish in Liverpool.

Related Stories

Ancient trees revealed by storms

Land Service Ammunition (LSA) resulting from historic military activity is commonly encountered across the UK by the public and construction industry alike. Such finds are much more common in rural areas than in urban environments, and can often be anticipated in areas such as former RAF stations or ranges. However, many such items are encountered entirely by surprise where the landowner or developer has no knowledge of any previous military use of the land.

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Project: **RAF Heyford**

Ref: **DA13850-00**

Source: Various news sources

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Oxford Mail

News

3rd April 2019

'Unexploded bomb' Upper Heyford: Cordon lifted

POLICE have lifted a cordon in a village near Bicester after safely removing two unexploded bombs.

Both devices have been safely removed and all police units have now left the scene.

The local school, Heyford Park Free School, was not evacuated, but the public were being urged to avoid the Upper Heyford area earlier.

The Explosive Ordance Disposal team arrived at a building site on the former RAF Upper Heyford earlier today, with Camp Road cordoned off.

The area has now reopened and police say there is 'no danger' to the public.



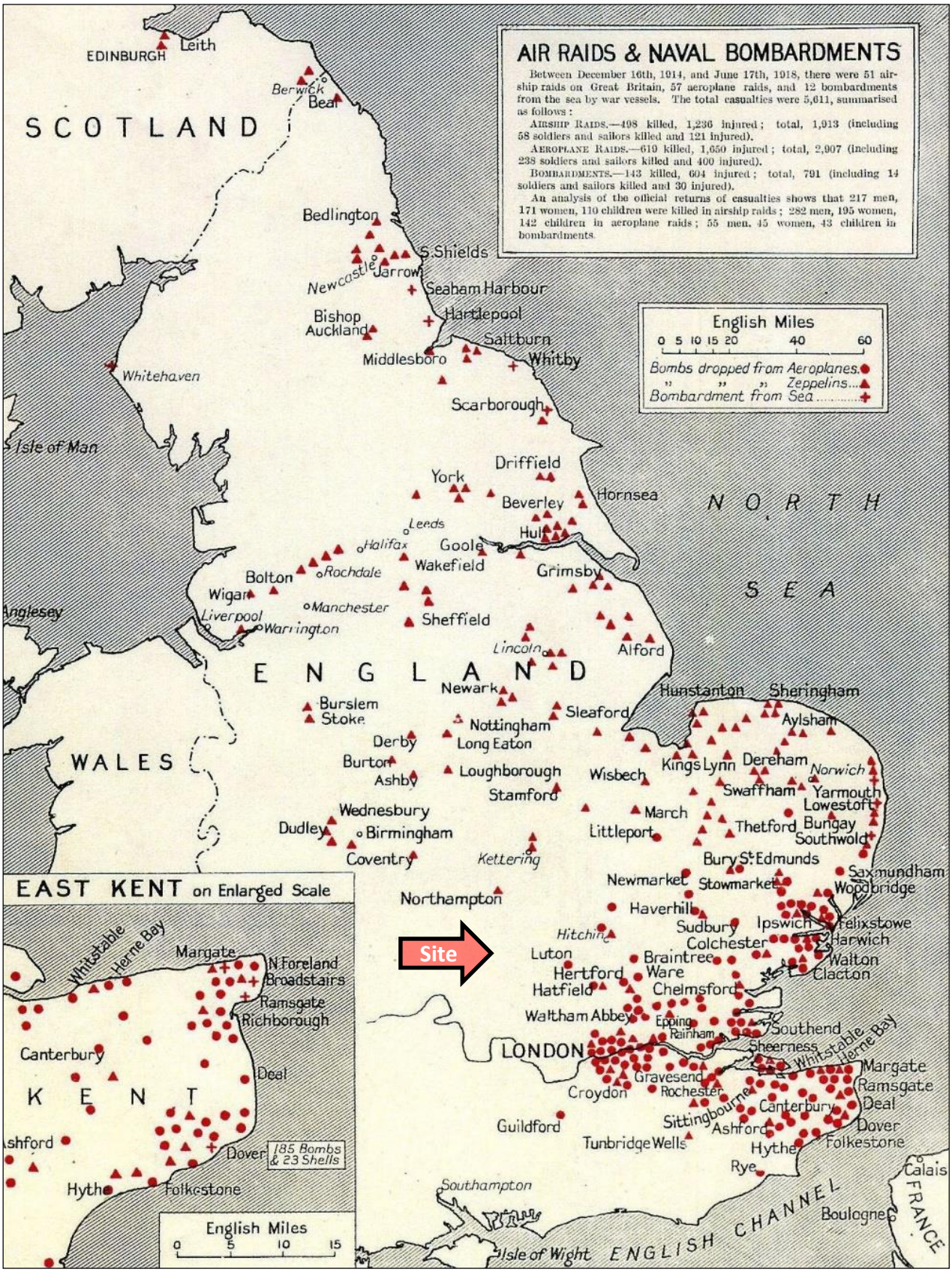
One device was safely disposed of yesterday, before a second bomb was discovered.

Thames Travel said last night that Camp Road had been closed, with witnesses suggesting a bomb disposal unit was on the scene.

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WWI Map of Air Raids and Naval Bombardments

Annex: I



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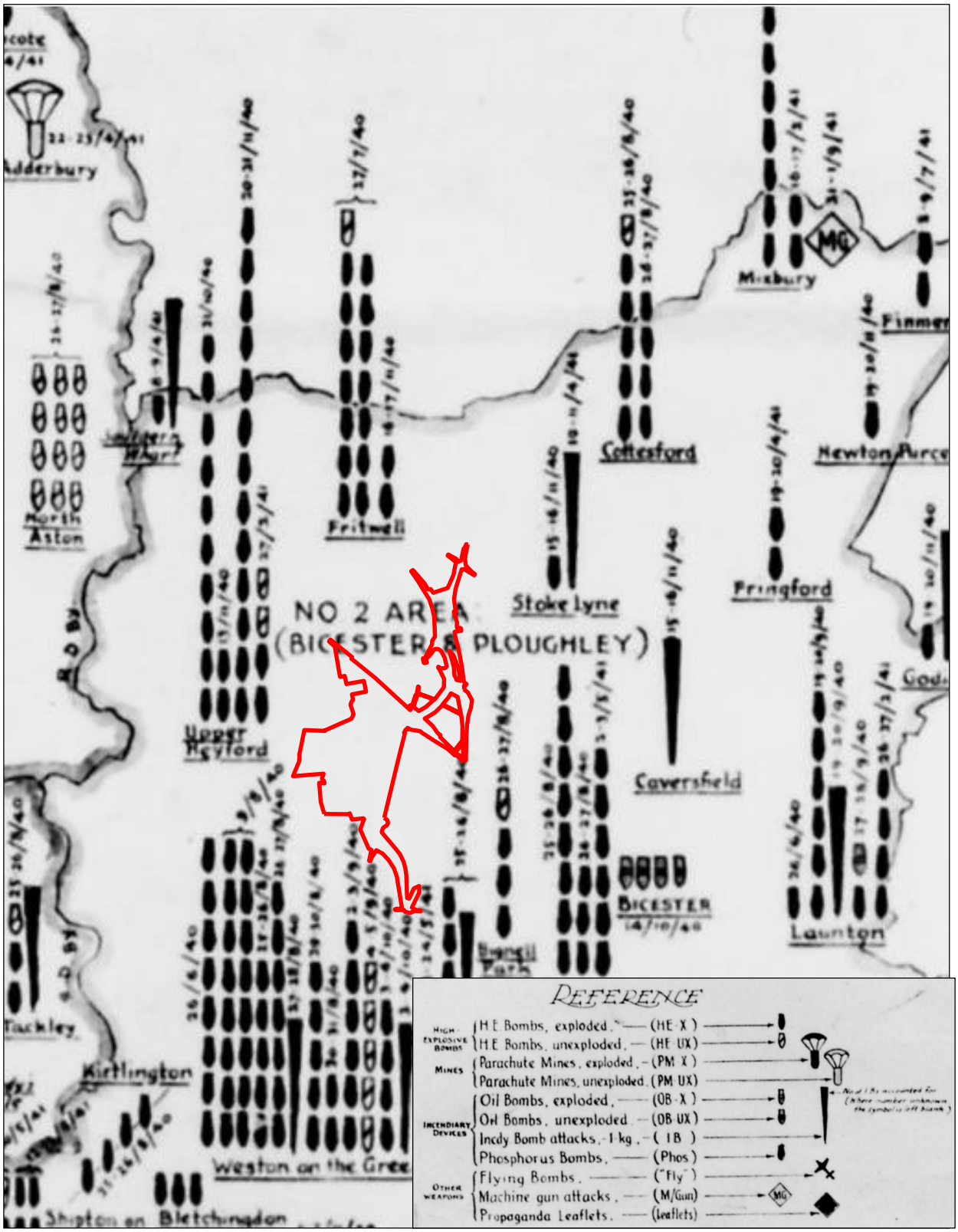
Ref: **DA13850-00**

Source: J. Morris, *German Air Raids on Britain*

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Oxfordshire Bomb Map

Annex: J



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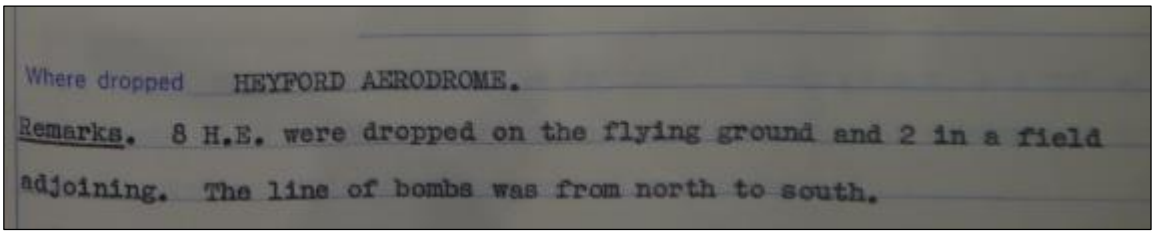
Source: Centre for Oxfordshire Studies

Approximate site boundary

N

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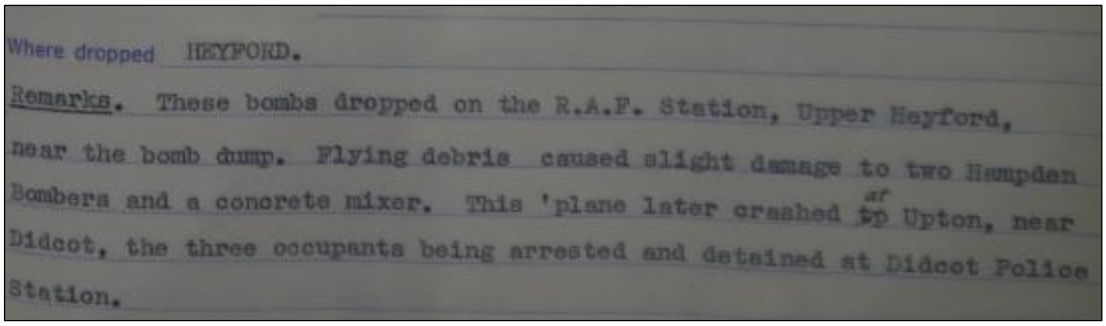
21st October 1940



Where dropped HEYFORD AERODROME.

Remarks. 8 H.E. were dropped on the flying ground and 2 in a field adjoining. The line of bombs was from north to south.

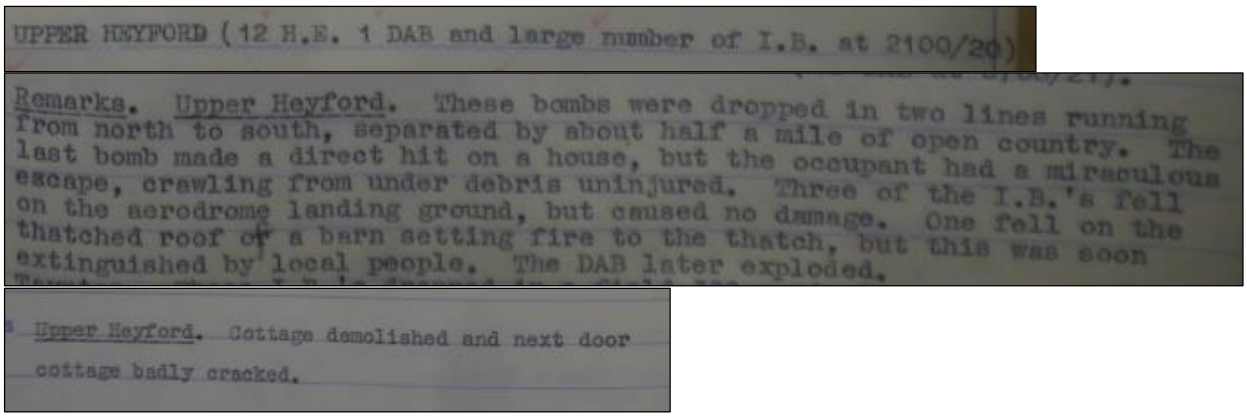
13th November 1940



Where dropped HEYFORD.

Remarks. These bombs dropped on the R.A.F. Station, Upper Heyford, near the bomb dump. Flying debris caused slight damage to two Hampden Bombers and a concrete mixer. This 'plane later crashed at Upton, near Didcot, the three occupants being arrested and detained at Didcot Police Station.

20th/21st November 1940

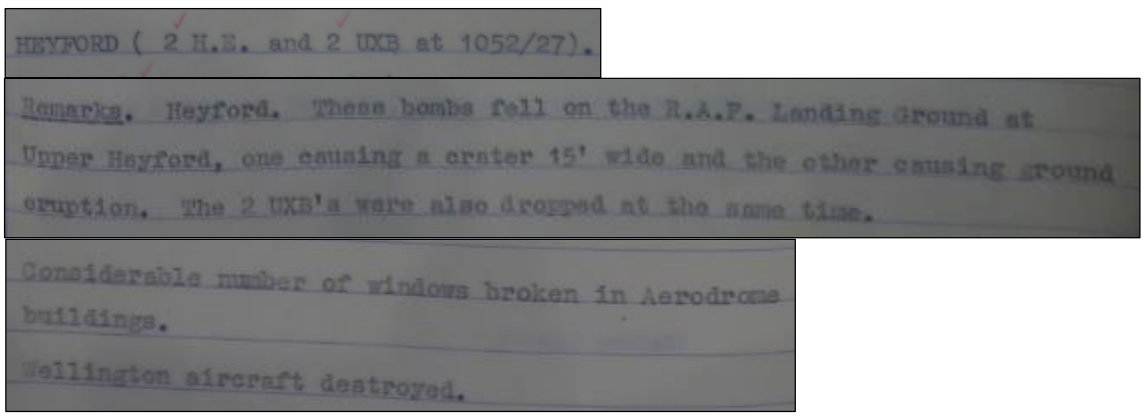


UPPER HEYFORD (12 H.E. 1 DAB and large number of I.B. at 2100/20)

Remarks. Upper Heyford. These bombs were dropped in two lines running from north to south, separated by about half a mile of open country. The last bomb made a direct hit on a house, but the occupant had a miraculous escape, crawling from under debris uninjured. Three of the I.B.'s fell on the aerodrome landing ground, but caused no damage. One fell on the thatched roof of a barn setting fire to the thatch, but this was soon extinguished by local people. The DAB later exploded.

Upper Heyford. Cottage demolished and next door cottage badly cracked.

27 February 1941



HEYFORD (2 H.E. and 2 UXB at 1052/27).

Remarks. Heyford. These bombs fell on the R.A.F. Landing Ground at Upper Heyford, one causing a crater 15' wide and the other causing ground eruption. The 2 UXB's were also dropped at the same time.

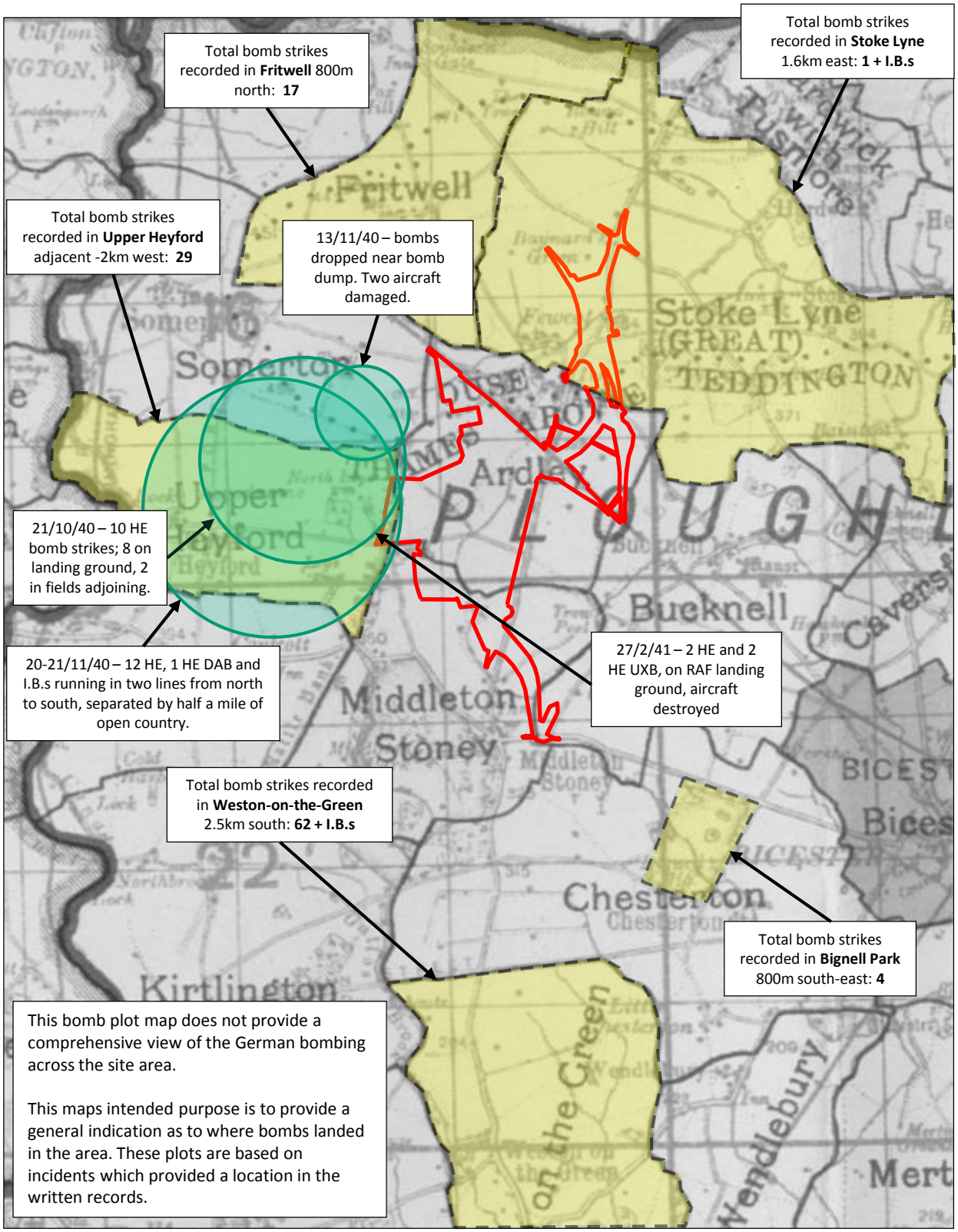
Considerable number of windows broken in Aerodrome buildings.

Wellington aircraft destroyed.

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Vision of Britain Map - Oxfordshire Bomb Map Overlay

Annex: **L**



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Project: **RAF Heyford**

Ref: **DA13850-00**

Source: Various Sources

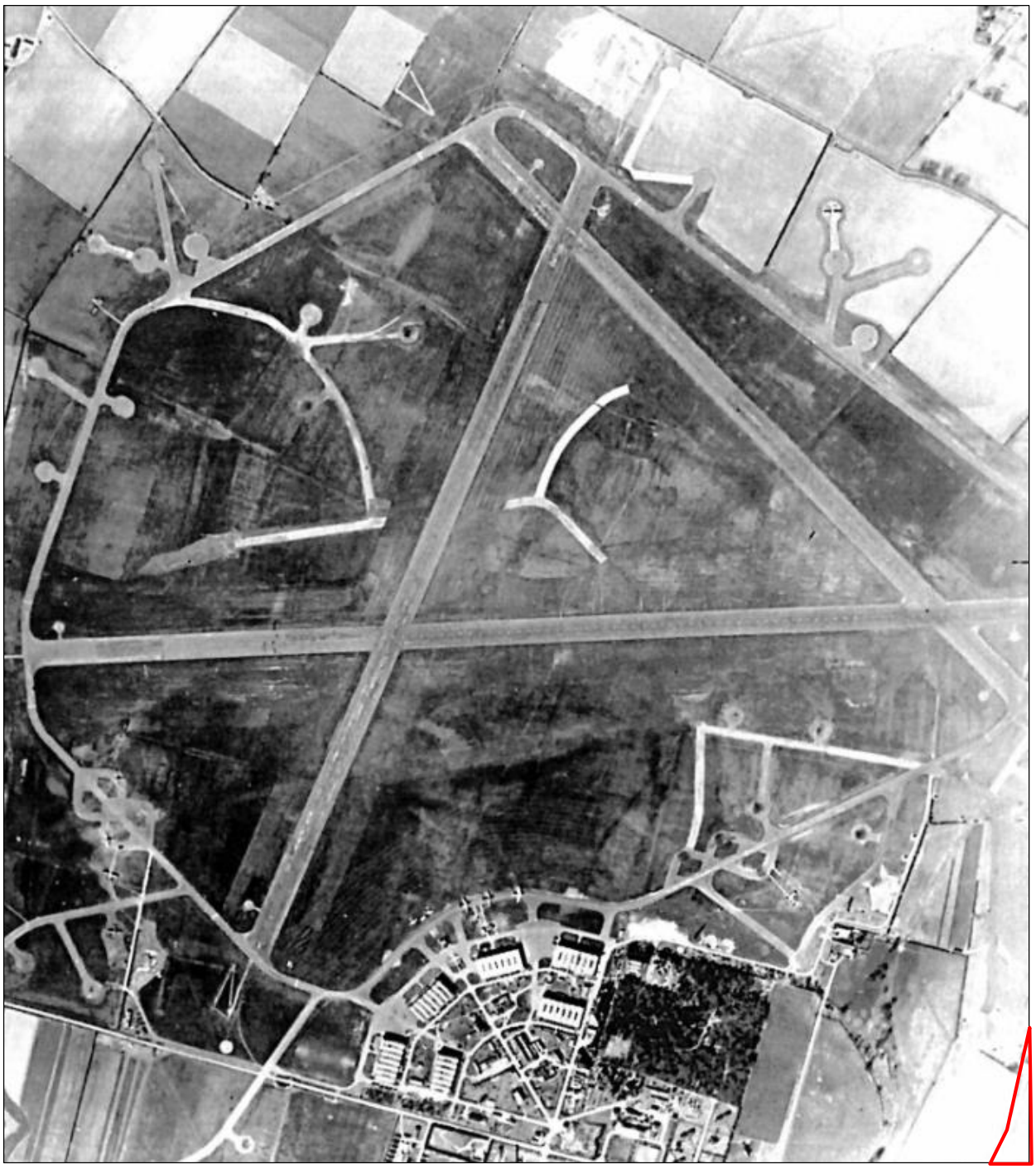
Approximate site boundary

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RAF Aerial Photography 16th April 1947

Annex: **M**



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Approximate site boundary

N

Project: **RAF Heyford**

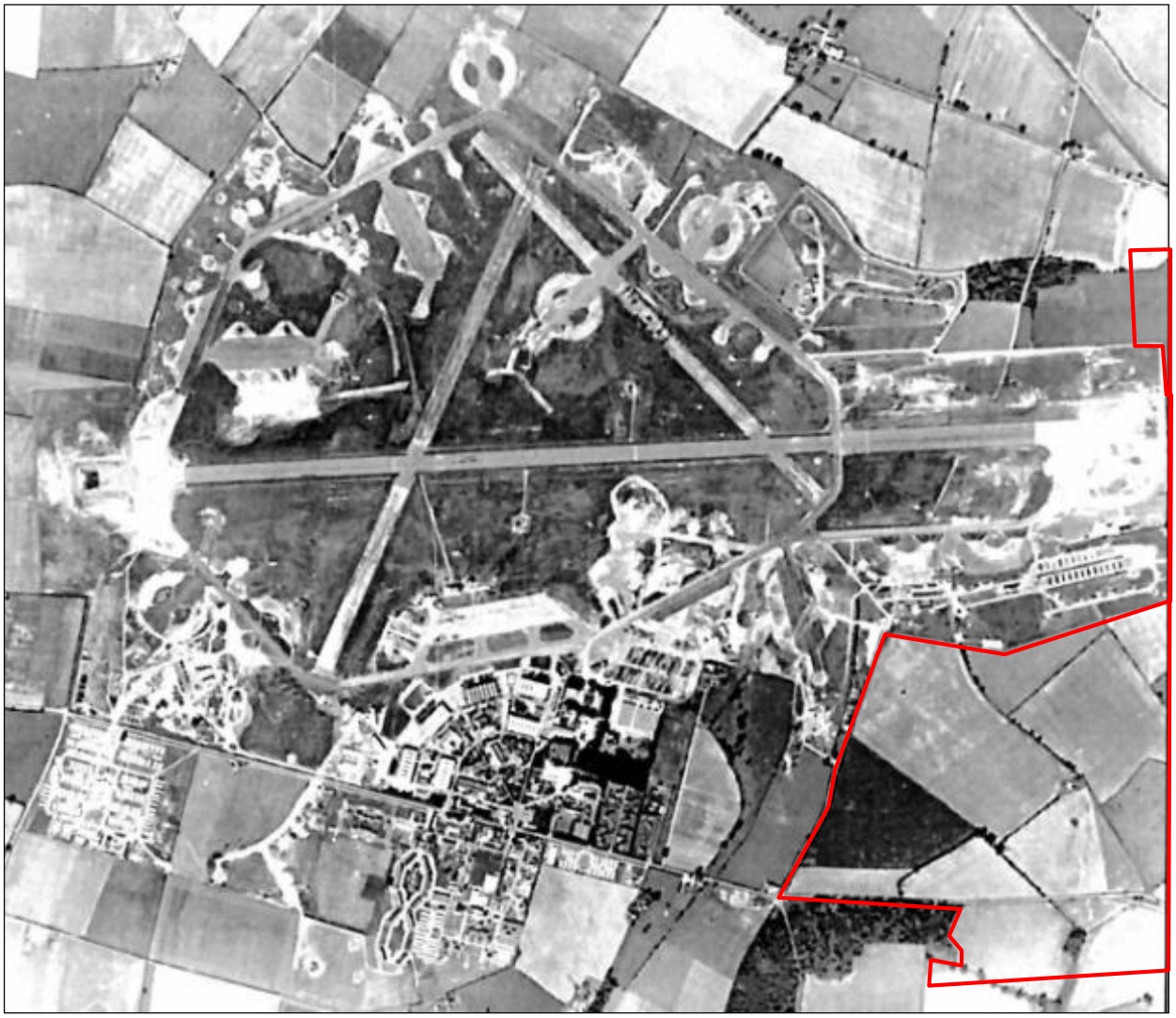
Ref: **DA13850-00**

Source: National Monuments Record Office (Historic England)

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RAF Aerial Photography 31st August 1954

Annex: **N1**



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Approximate site boundary

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Project: **RAF Heyford**

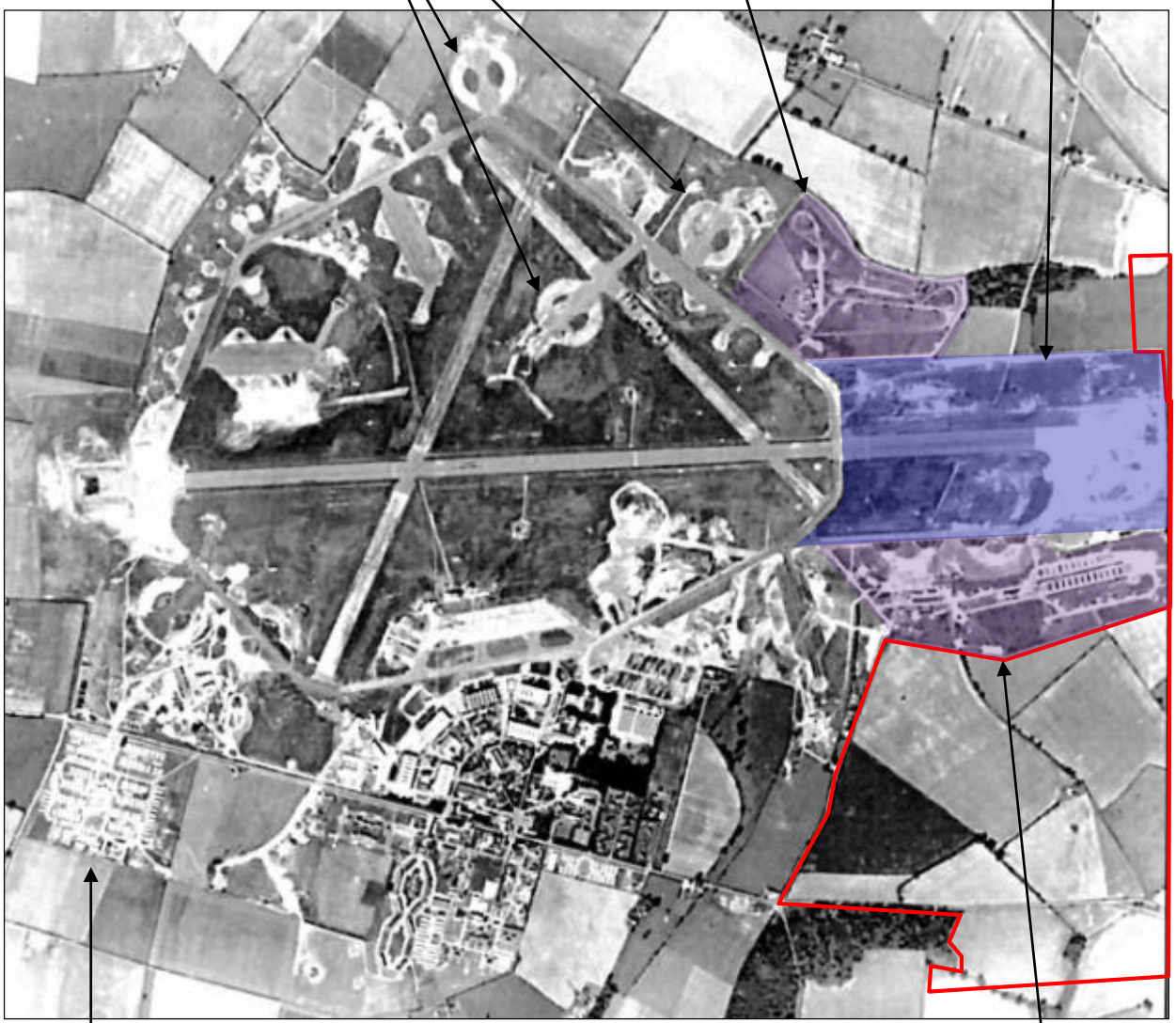
Ref: **DA13850-00**

Source: National Monuments Record Office (Historic England)

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RAF Aerial Photography 31st August 1954

Annex: **N2**



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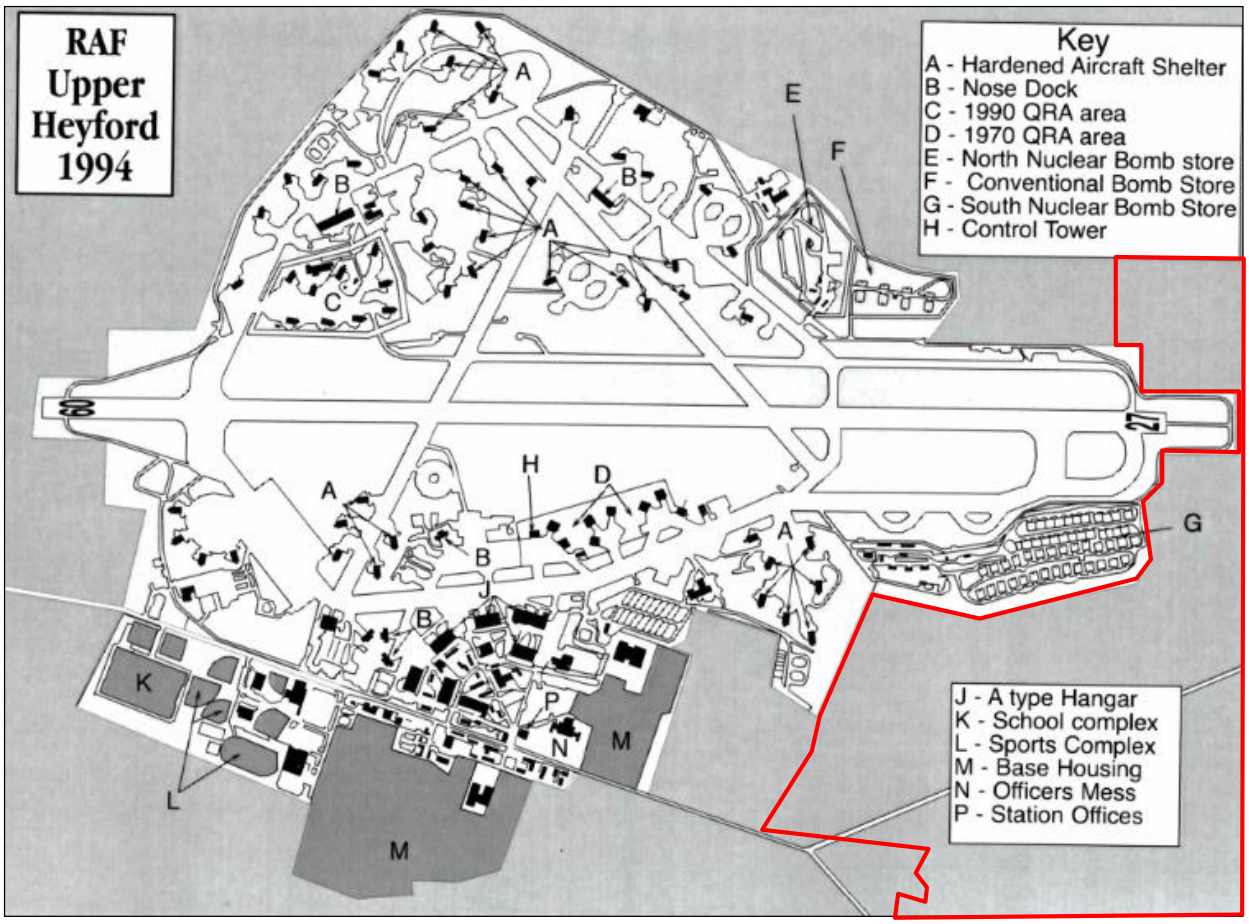
Project: **RAF Heyford**

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Source: National Monuments Record Office (Historic England)

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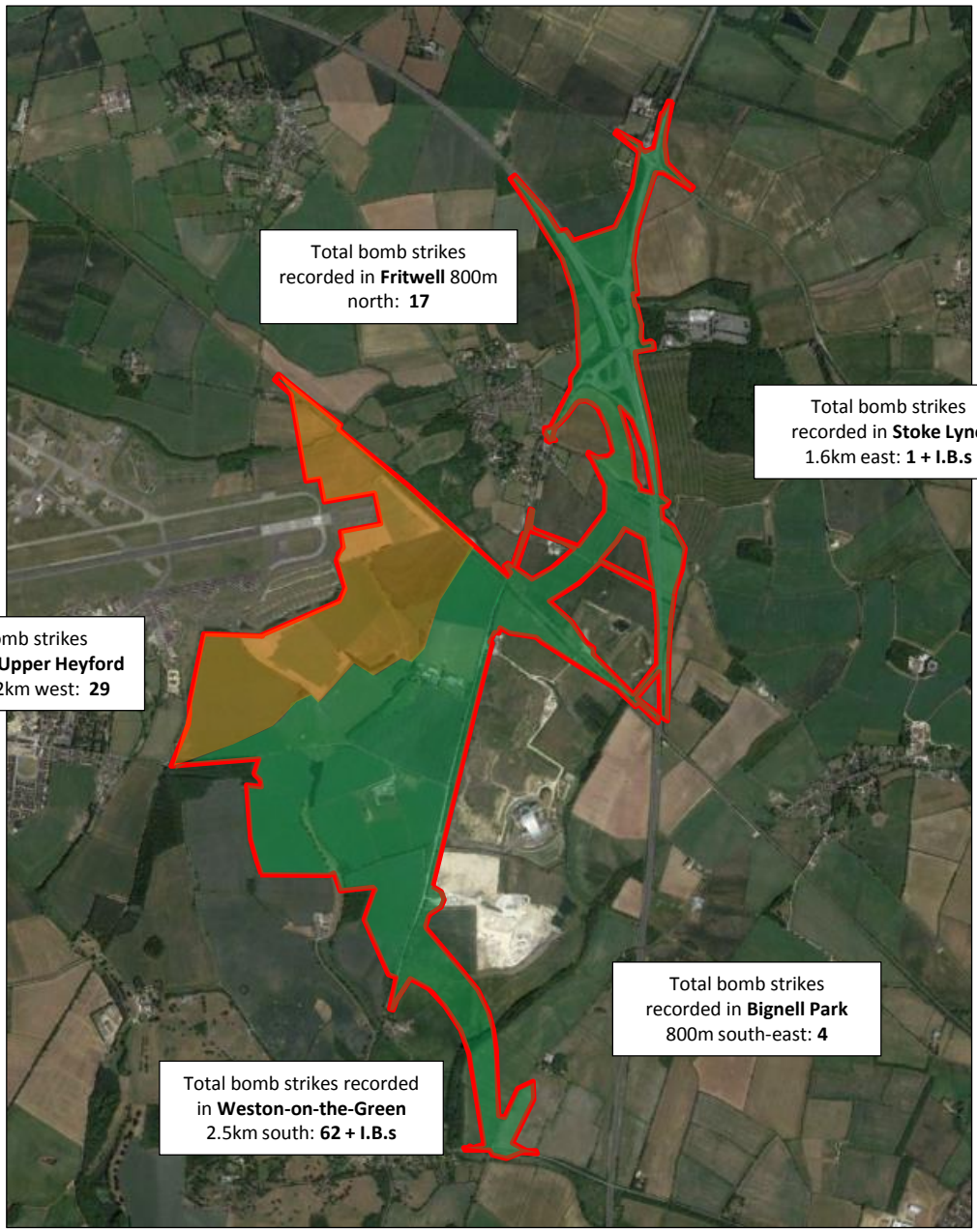
Ref: **DA13850-00**

Source: Airfield Focus: Upper Heyford

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German UXO Risk Map – (Recorded Bombing)

Annex: **P1**



For indicative purposes – not to scale.
Please note that this assessed risk map may not take into account all post-war redevelopment/excavations on site.

Low Risk

Medium Risk

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Project: **RAF Heyford**

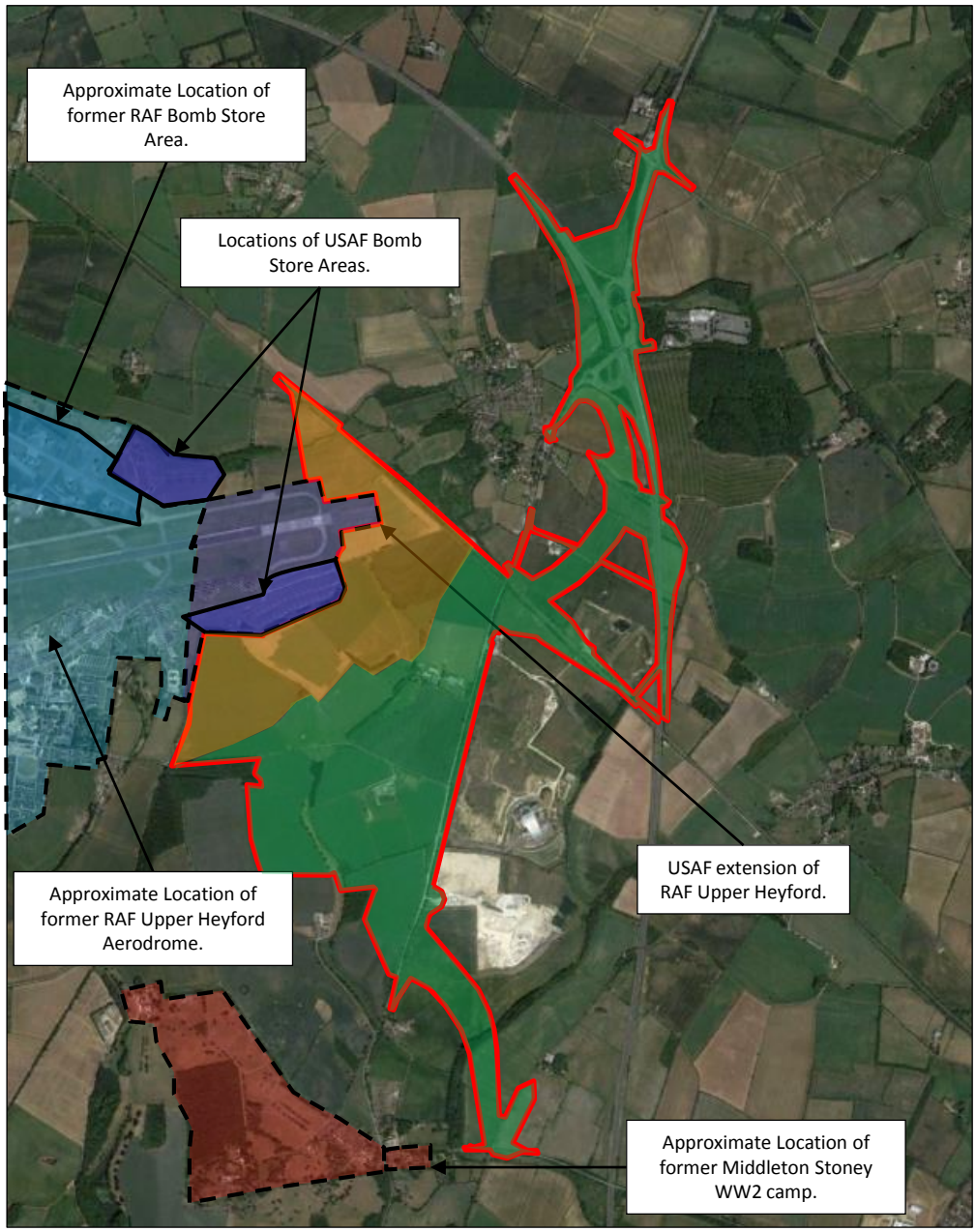
Ref: **DA13850-00**

Source: 1st Line Defence

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Allied UXO Risk Map – Overlay of Allied Military Features

Annex: **P2**



For indicative purposes – not to scale.
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Low Risk

Medium Risk

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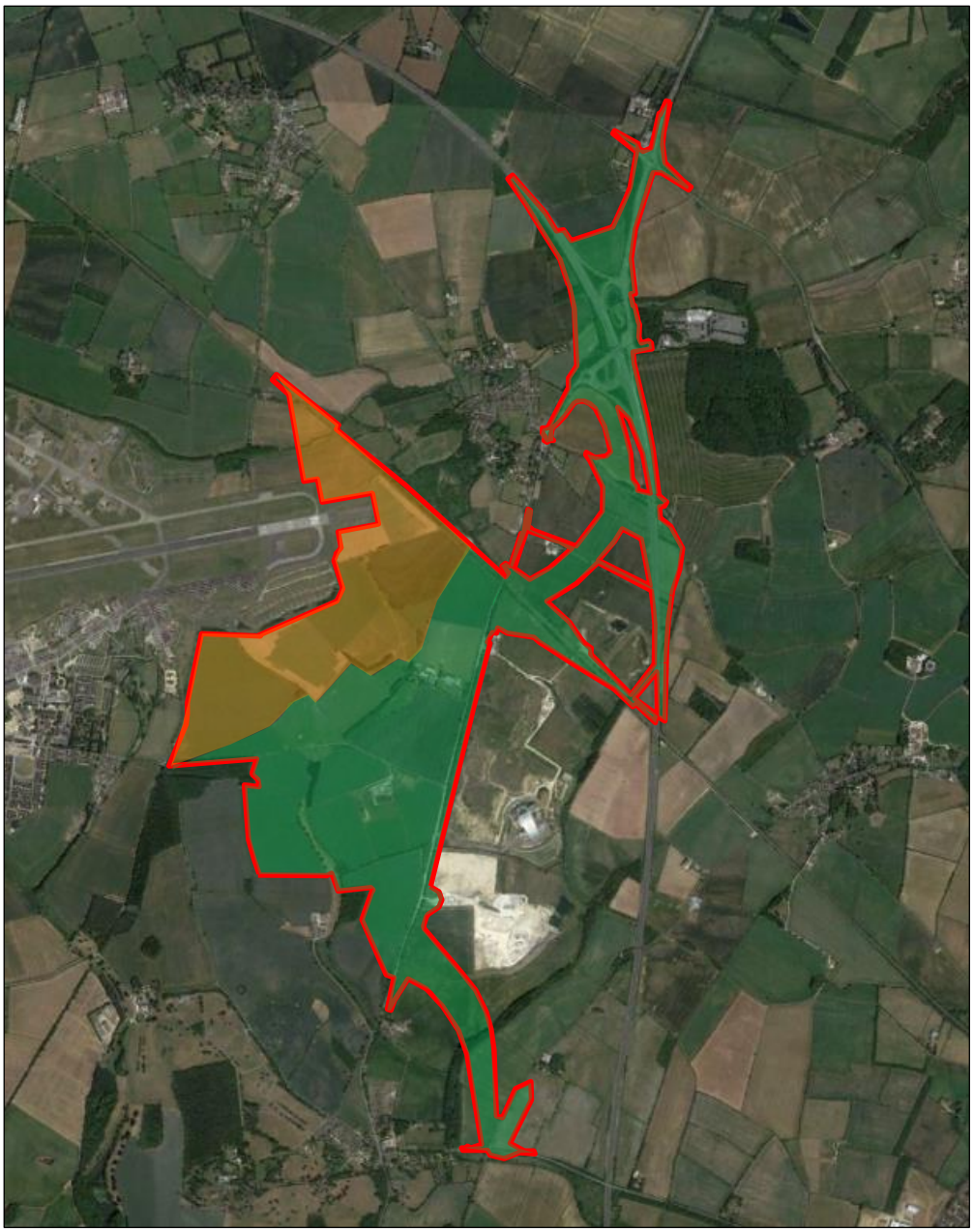
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German and Allied UXO Risk Map

Annex: **P3**



For indicative purposes – not to scale.
Please note that this assessed risk map may not take into account all post-war redevelopment/excavations on site.

All Risk Areas:

- Site Specific Unexploded Ordnance Awareness Briefings to all personnel conducting intrusive works
- UXO Risk Management Plan

Medium Risk Area:

- Non-Intrusive UXO Magnetometer Survey and Target Investigation (where appropriate.)
- Unexploded Ordnance (UXO) Specialist Presence on Site to support shallow intrusive works
- Intrusive Magnetometer Survey of all Borehole and pile locations down to a maximum bomb penetration depth

Low Risk

Medium Risk

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Ref: **DA13850-00**

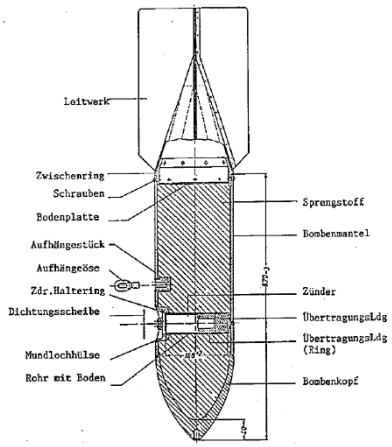
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Examples of German Bombs - HE

SC 50kg

Bomb Weight	40-54kg (110-119lb)
Explosive Weight	c25kg (55lb)
Fuze Type	Impact fuze/electro-mechanical time delay fuze
Bomb Dimensions	1,090 x 280mm (42.9 x 11.0in)
Body Diameter	200mm (7.87in)
Use	Against lightly damageable materials, hangars, railway rolling stock, ammunition depots, light bridges and buildings up to three stories.
Remarks	The smallest and most common conventional German bomb. Nearly 70% of bombs dropped on the UK were 50kg.

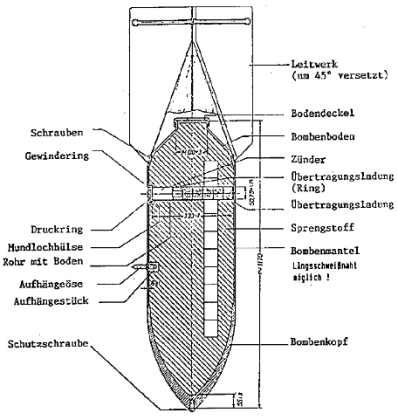






SC 250kg

Bomb Weight	245-256kg (540-564lb)
Explosive Weight	125-130kg (276-287lb)
Fuze Type	Electrical impact/mechanical time delay fuze.
Bomb Dimensions	1640 x 512mm (64.57 x 20.16in)
Body Diameter	368mm (14.5in)
Use	Against railway installations, embankments, flyovers, underpasses, large buildings and below-ground installations.
Remarks	It could be carried by almost all German bomber aircraft, and was used to notable effect by the Junkers Ju-87 Stuka (Sturzkampfflugzeug or dive-bomber).

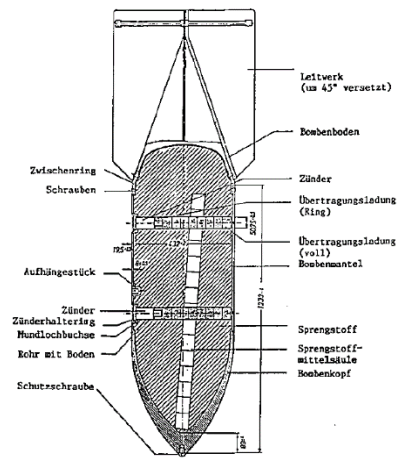




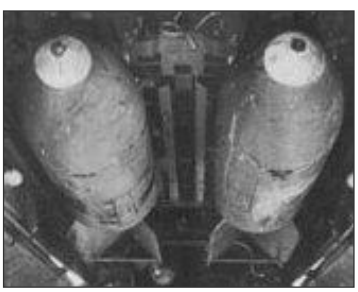


SC 500kg

Bomb Weight	480-520kg (1,058-1,146lb)
Explosive Weight	250-260kg (551-573lb)
Fuze Type	Electrical impact/mechanical time delay fuze.
Bomb Dimensions	1957 x 640mm (77 x 25.2in)
Body Diameter	470mm (18.5in)
Use	Against fixed airfield installations, hangars, assembly halls, flyovers, underpasses, high-rise buildings and below-ground installations.
Remarks	40/60 or 50/50 Amatol TNT, trialene. Bombs recovered with Trialen filling have cylindrical paper wrapped pellets 1-15/16 in. in length and diameter forming







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Project: **RAF Heyford**

Ref: **DA13850-00**

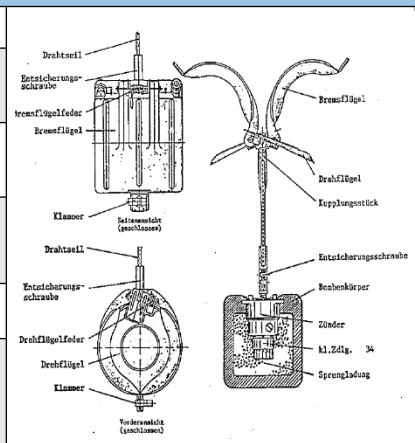
Source: Various sources

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Examples of German Bombs - HE, AP and Parachute Mines

SD2 Butterfly Bomb

Bomb Weight	2kg (4.41lb)
Explosive Weight	7.5oz (212.6 grams) of TNT surrounded by a layer of bituminous composition.
Fuze Type	41 fuze (time) , 67 fuze (clockwork time delay) or 70 fuze (anti-handling device)
Bomb Dimensions	Length 240 mm Width 140 mm Height 310 mm
Body Diameter	3in (7.62 cm) diameter, 3.1in (7.874) long
Use	It was designed as an anti-personnel/fragmentation weapon. They were delivered by air, being dropped in containers that opened at a predetermined height, thus scattering the bombs.
Remarks	The smallest and most common conventional German bomb. Nearly 70% of bombs dropped on the UK were 50kg.





Parachute Mine (Luftmine B / LMB)

Bomb Weight	987.017kg (2176lb)
Explosive Weight	125-130kg (276-287lb)
Fuze Type	Impact/ Time delay / hydrostatic pressure fuze
Bomb Dimensions	1640 x 512mm (64.57 x 20.16in)
Body Diameter	368mm (14.5in)
Use	Against civilian, military and industrial targets. Designed to detonate above ground level to maximise damage to a wider area.
Remarks	Parachute Mines were normally carried by HE 115 (Naval operations), HE 111 and JU 88 aircraft types. Deployed a parachute when dropped in order to control its descent.

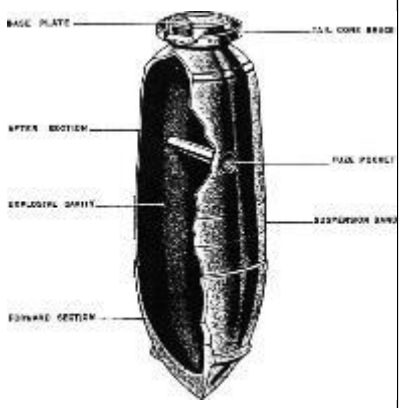


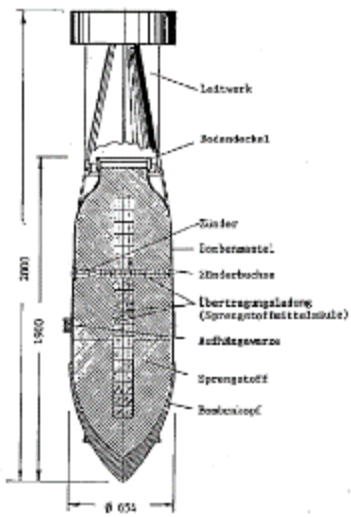




SC 1000kg

Bomb Weight	996-1061kg (1,058-1,146lb)
Explosive Weight	530-620kg (551-573lb)
Fuze Type	Electrical impact/mechanical time delay fuze.
Filling	Mixture of 40% amatol and 60% TNT, but when used as an anti-shipping bomb it was filled with Trialen 105, a mixture of 15% RDX, 70% TNT and 15% aluminium powder.
Bomb Dimensions	2800 x 654mm (77 x 25.2in)
Body Diameter	654mm (18.5in)
Use	SC type bombs are General Purpose Bombs used primarily for general demolition work. Constructed of parallel walls with comparatively heavy noses. They are usually of three piece welded construction





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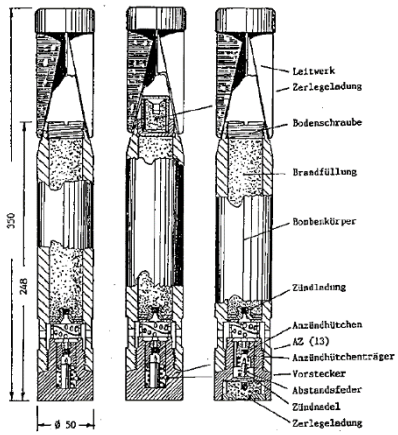
Source: Various sources

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Examples of German Bombs - Incendiary

1kg Incendiary Bomb

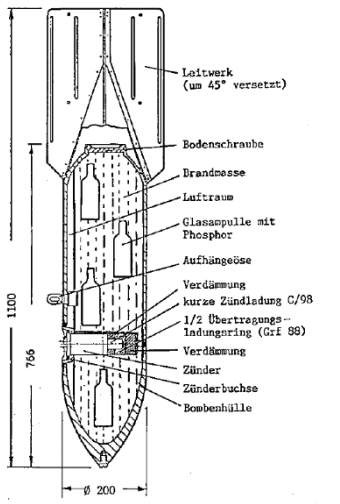
Bomb Weight	1.0 and 1.3kg (2.2 and 2.87lb)
Explosive Weight	680gm (1.3lb) Thermite
Fuze Type	Impact fuze
Bomb Dimensions	350 x 50mm (13.8 x 1.97in)
Body Diameter	50mm (1.97in)
Use	As incendiary – dropped in clusters against towns and industrial complexes
Remarks	Magnesium alloy case. Sometimes fitted with high explosive charge. The body is a cylindrical alloy casting threaded internally at the nose to receive the fuze holder and fuze.

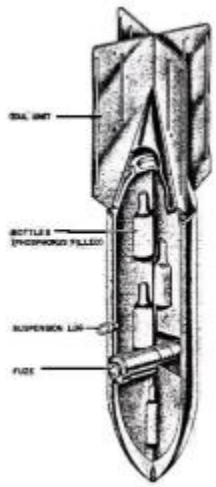




C50 A Incendiary Bomb

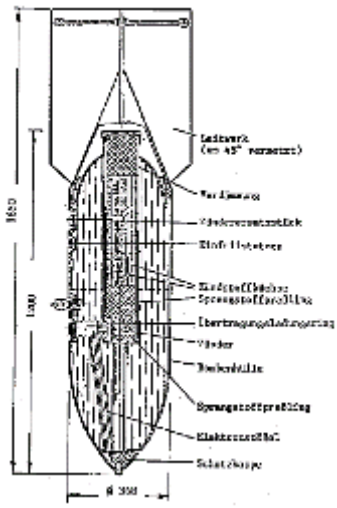
Bomb Weight	c41kg (90.4lb)
Explosive Weight	0.03kg (0.066lb)
Incendiary Filling	12kg (25.5lb) liquid filling with phosphor igniters in glass phials. Benzine 85%; Phosphorus 4%; Pure Rubber 10%
Fuze Type	Electrical impact fuze
Bomb Dimensions	1,100 x 280mm (43.2 x 8in)
Use	Against all targets where an incendiary effect is to be expected
Remarks	Early fill was a phosphorous/carbon disulphide incendiary mixture





Flam C-250 Oil Bomb

Bomb Weight	125kg (276lb)
Explosive Weight	1kg (2.2lb)
Fuze Type	Super-fast electrical impact fuze
Filling	Mixture of 30% petrol and 70% crude oil
Bomb Dimensions	1,650 x 512.2mm (65 x 20.2in)
Body Diameter	368mm (14.5in)
Use	Often used for surprise attacks on living targets, against troop barracks and industrial installations. Thin casing – not designed for ground penetration





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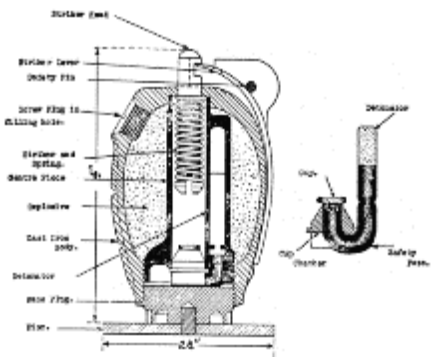
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Examples of LSA - Grenades

No. 36 'Mills' Grenade

Weight	760g filled (1ib 6oz)
Explosive Weight	71g (2.5 oz) Baratol filling.
Fuze Type	4 second delay hand-throwing fuze
Dimensions	95 x 61mm (3.7 x 2.4in)
Use	Fragmentation explosive at approx. 30m range 100m range of damage.
Remarks	First introduced in 1915 its classic grooved 'pineapple' design was designed to provide uniform fragmentation. Approx. over 70million were produced.

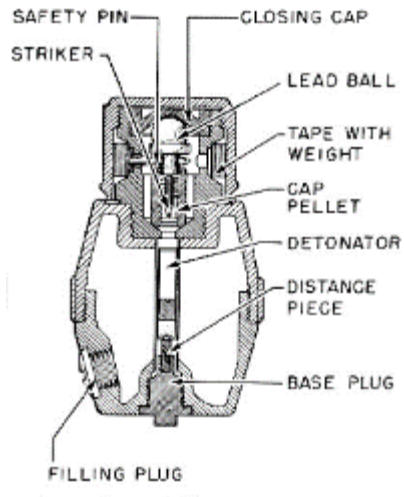




No. 69 Grenade

Weight	383g (0.81b)
Explosive Weight	93g (3.25 oz) of either Amatol, Baratol or Lyddite
Fuze Type	'All-ways' Fuze. Compromised of a safety cap, a weighted streamer attached to a steel ball bearing and a safety bolt designed to detonate from any point of impact.
Dimensions	114 x 60mm (4.5 x 2 .4 in)
Use	A blast grenade for use as an offensive weapon.
Remarks	Introduced December 1940 and made from the plastic Bakelite as opposed to conventional metals. Detection is difficult due to this low metal content.





L2 Grenade

Weight	454g (16 oz)
Explosive Weight	164g. (16 oz)
Fuze Type	Time Friction Fuze
Dimensions	Approx. 99 x 57 mm (3.9 x 2.2 in)
Use	A widely used anti-personnel grenade, a version of the American M26. Variants still see use in the present day.
Remarks	The L2 series also came as a Practice (L3) grenade and a Drill (L4) Grenade. The Drill variant, with a non-functional fuze and no filing, is visible on the far right.





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Examples of LSA - Mortars

Typical 2 Inch High Explosive Mortar

Weight	1.02kg (2.25lb)
Maximum Range	460m (500yards)
Filling	200g RDX/TNT
Dimensions	51 x 290mm (2in x 11.4 in)
Fuze Type	An impact fuze which detonates the fuze booster charge and in turn the high explosive charge.
Use	A small, portable mortar introduced into the British army in 1938. It had greater range and firepower over hand and rifle grenades, and was used to attack targets behind cover with high explosive rounds.
Remarks	Detonation causes the mortars bomb body to shatter producing optimum fragmentation and blast effect at the target.





Typical 3 inch Smoke Mortar

Weight	4.5kg (9lb 14oz)
Maximum Range	2515m (2,750 yards)
Filling	White phosphorus & smoke fill (also came in Explosive & Illuminating models)
Bomb Dimensions	490 x 76mm (19.3in x 3in)
Fuze Type	An impact fuze which initiates a bursting charge. This ruptures the mortar bomb 's body and disperses the phosphorus filler
Use	As a screening devices for unit movement or to impair enemy field of vision.
Remarks	This mortars long cylindrical body and tail sometimes causes it to be misrecognised as a German incendiary bomb.









ML 4.2 inch Mortar

Weight	9kg (19lb 13oz)
Maximum Range	3,750m (4,100 yards)
Filling	High explosive, smoke (white phosphorous or Titanium Tetrachloride) or chemical
Bomb Dimensions	500 x 105 mm (19 in x 4 in)
Fuze Type	Sensitive fuze with HE bursting charge.
Use	A widely used heavy motor which first saw use in 1942 and saw usage throughout the post-war period.
Remarks	Different markings denoted different filings. See image to the right.





L to R: HE, Smoke, Chemical, Smoke BE.

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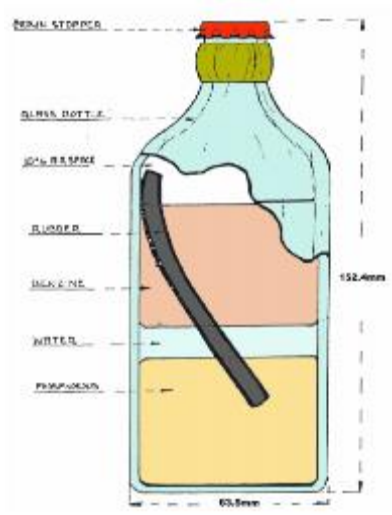
Examples of LSA - Home Guard Ordnance

Self Igniting Phosphorous (SIP) Grenades

Weight	Various
Filling	White Phosphorous and Benzene
Design	The filling was contained in a pint sized glass bottle with water and a strip of rubber. Over time the rubber dissolved to create a sticky which would self ignite when the bottle broke.
Use	Originally intended as an anti-tank incendiary weapon deployed by hand. Designed to be produced cheaply without consuming materials needed to produce armaments on the front line.
Remarks	The Home Guard hid caches of these grenades during the war for use in the event of an invasion. Not all locations were officially recorded and some caches were lost. Occasionally discovered today. In all cases, the grenades are still found to be dangerous.







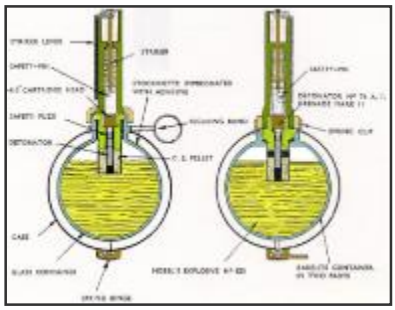
No. 74 Grenade (Sticky Bomb)

Weight	Approx. 1.1kg (2ib 4oz)
Filling	Approx. 600g Nobel's No.283 (Nitro-glycerine)
Design	A glass ball on the end of a Bakelite (plastic) handle. The inside of the ball would contain the explosive filling and the outside a very sticky adhesive coating.
Use	An anti-tank grenade primarily issued to the home guard. It required the user to come in very close proximity with the target and smash the glass explosive container against it.
Remarks	One of a number of weapons developed for use as an *ad hoc* solution to the lack of sufficient anti-tank guns in the aftermath of the Dunkirk evacuation amid fear of German invasion.







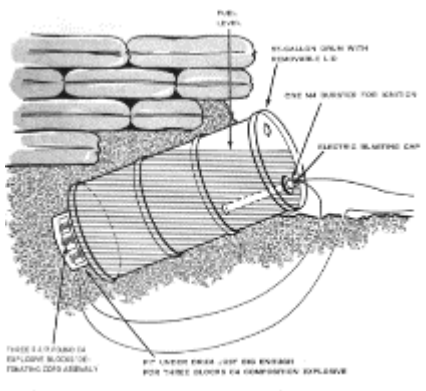


Flame Fougasse Bomb

Weight	Various
Filling	Initially a mixture of 40% petrol and 60% gas. Ammonal provided the propellant charge.
Design	Usually constructed from a 40-galleon drum dug into a roadside and camouflaged.
Use	As an improvised anti-tank bomb. When triggered the Fougasse could project a beam of burning sticky fuel in a fixed direction from up to 3m (10ft) wide and 27m (30yards) long.
Remarks	A highly unorthodox weapon designed by the Petroleum warfare department to address a critical lack of weapons in 1940. 50,000 are estimated to have been distributed around the UK.







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Examples of Small Arms Ammunition

Cannon Ammunition



Rifle Ammunition





Buried and Decayed Ammunition





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Examples of Anti-Aircraft Projectiles

QF 3.7 Inch WWII Anti-Aircraft Projectile

Projectile Weight	28lb (12.6 kg)
Explosive Weight	2.52lbs
Fuze Type	Mechanical Time Fuze
Dimensions	3.7in x 14.7in (94mm x 360mm)
Rate of Fire	10 to 20 rounds per minute
Use	High Explosive Anti-Aircraft projectile. 4.5in projectiles were also used in this role.
Ceiling	30,000ft to 59,000ft









40mm Bofors Projectile

Projectile Weight	1.96lb (0.86kg)
Explosive Weight	300g (0.6lb)
Fuze Type	Proximity and Mechanical Time Fuze
Rate of Fire	120 rounds per minute
Projectile Dimensions	40mm x 310mm (1.6in x 12.2in)
Ceiling	23,000ft (7000m)





Unrotated Projectile (UP) – Z Battery

Projectile Weight	84lb (24.5kg)
Warhead Weight	4.28lb (1.94kg)
Warhead	Aerial Mine with a No. 700 / 720 fuze
Filling	High Explosive
Dimensions	1930mm x 82.6mm (76 x 3.25in)
Use	As a short range rocket-firing anti-aircraft weapon developed for the Royal Navy. It was used extensively by British ships during the early days of World War II. The UP was also used in ground-based single and 128-round launchers known as Z Batteries.





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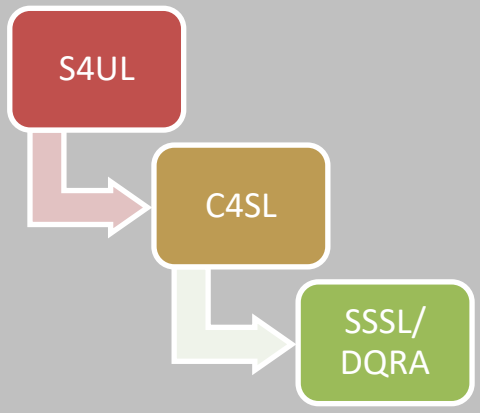
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Appendix 4 : CLEA Flowchart and Work Sheets

Human Health Generic QRA Worksheet

Oxfordshire RFI	NTH2479
Samples on shallow soils	

GSAC Hierarcy



Define CSM – Is site represented by a standard land use?

Residential with / without homegrown produce
Commercial / Industrial
Public Open Space - Residential (S4UL/C4SL only)
Public Open Space - Park (S4UL/C4SL only)

GSAC Type (BWB, LQM S4UL, C4SL, Bespoke)	**LQM_CIEH_S4UL**
Key Receptor/CSM (Residential/Commercial/POS)	**S4UL Public open space (park)**
Organic Matter % (If unknown use 1%)	**2.5**

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Publication Number S4UL3271

Generic Assessment Criteria Oxfordshire RFI NTH2479	S4UL Public open space (park) mg/kg	Source
Arsenic	1.70E+02	LQM_CIEH_S4UL
Barium	1.35E+03	LQM_CIEH_S4UL
Beryllium	6.30E+01	LQM_CIEH_S4UL
Boron	4.60E+04	LQM_CIEH_S4UL
Cadmium	5.32E+02	LQM_CIEH_S4UL
Chromium VI	2.20E+02	LQM_CIEH_S4UL
Chromium III	3.30E+04	LQM_CIEH_S4UL
Copper	4.40E+04	LQM_CIEH_S4UL
Lead*	1.30E+03	DEFRA_C4SL
Inorganic Mercury	2.40E+02	LQM_CIEH_S4UL
Nickel	3.40E+03	LQM_CIEH_S4UL
Selenium	1.80E+03	LQM_CIEH_S4UL
Vanadium	5.00E+03	LQM_CIEH_S4UL
Zinc	1.70E+05	LQM_CIEH_S4UL
Cyanide (Free)	4.30E+01	BWB
Cyanide (Complex)	2.13E+02	BWB
Phenols (Total)	6.90E+02	LQM_CIEH_S4UL
Benzene	1.00E+02	LQM_CIEH_S4UL
Toluene	9.50E+04	LQM_CIEH_S4UL
Ethyl benzene	2.20E+04	LQM_CIEH_S4UL
Total Xylene	2.30E+04	LQM_CIEH_S4UL
TPH (EC5-6) aliphatic	1.30E+05	LQM_CIEH_S4UL
TPH (>EC6-8) aliphatic	2.20E+05	LQM_CIEH_S4UL
TPH (>EC8-10) aliphatic	1.80E+04	LQM_CIEH_S4UL
TPH (>EC10-12) aliphatic	2.30E+04	LQM_CIEH_S4UL
TPH (>EC12-16) aliphatic	2.50E+04	LQM_CIEH_S4UL
TPH (>EC16-21) aliphatic	4.80E+05	LQM_CIEH_S4UL
TPH (>EC21-35) aliphatic	4.80E+05	LQM_CIEH_S4UL
TPH (>EC35-44) aliphatic	4.80E+05	LQM_CIEH_S4UL
TPH (>EC6-7) aromatic (benzene)	8.40E+04	LQM_CIEH_S4UL
TPH (>EC7-8) aromatic (toluene)	9.50E+04	LQM_CIEH_S4UL
TPH (>EC8-10) aromatic	8.50E+03	LQM_CIEH_S4UL
TPH (>EC10-12) aromatic	9.70E+03	LQM_CIEH_S4UL
TPH (>EC12-16) aromatic	1.00E+04	LQM_CIEH_S4UL
TPH (>EC16-21) aromatic	7.70E+03	LQM_CIEH_S4UL
TPH (>EC21-35) aromatic	7.80E+03	LQM_CIEH_S4UL
TPH (>EC35-44) aromatic	7.80E+03	LQM_CIEH_S4UL
Total TPH	5.00E+02	LQM_CIEH_S4UL
Naphthalene	1.90E+03	LQM_CIEH_S4UL
Acenaphthylene	3.00E+04	LQM_CIEH_S4UL
Acenaphthene	3.00E+04	LQM_CIEH_S4UL
Fluorene	2.00E+04	LQM_CIEH_S4UL
Phenanthrene	6.20E+03	LQM_CIEH_S4UL
Anthracene	1.50E+05	LQM_CIEH_S4UL
Fluoranthene	6.30E+03	LQM_CIEH_S4UL
Pyrene	1.50E+04	LQM_CIEH_S4UL
Benzo(a)anthracene	5.60E+01	LQM_CIEH_S4UL
Chrysene	1.10E+02	LQM_CIEH_S4UL

Generic Assessment Criteria Oxfordshire RFI NTH2479	S4UL Public open space (park) mg/kg	Source
Benzo(b)fluoranthene	1.50E+01	LQM_CIEH_S4UL
Benzo(k)fluoranthene	4.10E+02	LQM_CIEH_S4UL
Benzo(a)pyrene	1.20E+01	LQM_CIEH_S4UL
Indeno(1,2,3-c,d)pyrene	1.70E+02	LQM_CIEH_S4UL
Dibenzo(a,h)anthracene	1.30E+00	LQM_CIEH_S4UL
Benzo(g,hi)perylene	1.50E+03	LQM_CIEH_S4UL
Coal Tar (B(a)P as surrogate marker	4.70E+00	LQM_CIEH_S4UL
Tetrachloroethene (PCE)	1.10E+03	LQM_CIEH_S4UL
Trichloroethene (TCE)	9.10E+01	LQM_CIEH_S4UL
***cis* -1,2-Dichloroethene**	0.00E+00	LQM_CIEH_S4UL
Vinyl Chloride (VC)	5.00E+00	LQM_CIEH_S4UL
1,1,2,2-Tetrachloroethane (PCA)	2.10E+03	LQM_CIEH_S4UL
1,1,1-Trichloroethane (TCA)	7.60E+04	LQM_CIEH_S4UL
1,2-Dichloroethane	2.40E+01	LQM_CIEH_S4UL
Carbon Tetrachloride	2.70E+02	LQM_CIEH_S4UL
Carbon disulphide	1.90E+03	LQM_CIEH_S4UL

Location	Sample depth	Easting	Northing	Strata Type	Arsenic	Barium	Beryllium	Boron	Cadmium	Chromium VI	Chromium III	Copper	Lead	Inorganic Mercury	Nickel	Selenium	Vanadium	Zinc	Cyanide (Free)	Cyanide (Complex)	Phenols (Total)
Detection Limit					1	1	0.06	0.2	0.2	1.8	1	1	1	0.3	1	1	1	1	1	1	1
GSAC					1.70E+02	1.35E+03	6.30E+01	4.60E+04	5.32E+02	2.20E+02	3.30E+04	4.40E+04	1.30E+03	2.40E+02	3.40E+03	1.80E+03	5.00E+03	1.70E+05	4.30E+01	2.13E+02	6.90E+02
TP161	0.1				12	54	1	3.1	0.2	1.8	25	14	25	0.3	18	1	43	62	1	1	1
TP165	0.1				11	53	1.3	3.6	0.4	1.8	31	13	22	0.3	20	1	47	69	1	1	1
TP167	0.1				12	56	1.6	2.7	0.6	1.8	39	28	32	0.3	24	1	56	280	1	1	1
TP167	0.5				11	51	1.4	2.5	0.2	1.8	32	11	18	0.3	23	1	47	62	1	1	1
TP169	0.41				11	37	1.2	1.6	0.2	1.8	30	8.6	11	0.3	20	1	42	40	1	1	1
TP170	0.05				15	73	1.3	2.8	0.2	1.8	33	18	28	0.3	25	1	54	70	1	1	1
TP173	0.7				6.5	26	0.49	0.4	0.2	1.8	13	7.2	6.7	0.3	9.7	1	24	28	1	1	1
TP176	0.15				16	84	1.2	1.6	0.2	1.8	30	13	26	0.3	25	1	52	68	1	1	1
TP176	0.8				5.3	24	0.48	0.5	0.2	1.8	12	6.1	6.7	0.3	8.9	1	23	26	1	1	1
TP180	0.1				18	70	1	2.8	0.2	1.8	29	15	24	0.3	22	1	51	74	1	1	1
TP180	0.6				12	23	0.42	0.8	0.2	1.8	12	11	11	0.3	11	1	24	76	1	1	1
TP181	0.1				19	57	1.1	1.5	0.2	1.8	29	12	19	0.3	21	1	65	51	1	1	1
TP183	0.05																				
TP183	0.45				8.7	46	1.3	0.8	0.2	1.8	29	21	19	0.3	22	1	41	130	1	1	1
TP185	0.3				6.3	41	1.7	1.2	0.2	1.8	33	60	42	0.3	30	1	45	260	1	1	1
TP187	0.15				20	72	1.2	1	0.2	1.8	29	45	38	0.3	28	1	50	240	1	1	1
TP187	0.8				15	15	0.44	0.4	0.2	1.8	7.4	58	27	0.3	16	1	16	290	1	1	1
TP189	0.2				15	89	1.4	1.8	1	1.8	33	200	99	0.3	36	1	52	1200	1	1	1

Location	Sample depth	Benzene	Toluene	Ethyl benzene	Total Xylene	TPH (EC5-6) aliphatic	TPH (>EC6-8) aliphatic	TPH (>EC8-10) aliphatic	TPH (>EC10-12) aliphatic	TPH (>EC12-16) aliphatic	TPH (>EC16-21) aliphatic	TPH (>EC21-35) aliphatic	TPH (>EC6-7) aromatic (benzene)	TPH (>EC7-8) aromatic (toluene)	TPH (>EC8-10) aromatic	TPH (>EC10-12) aromatic	TPH (>EC12-16) aromatic	TPH (>EC16-21) aromatic	TPH (>EC21-35) aromatic
Detection Limit		0.001	0.001	0.001	0.001	0.001	0.001	0.001	1	2	8	8	0.001	0.001	1	2	10	10	10
GSAC		1.00E+02	9.50E+04	2.20E+04	2.30E+04	1.30E+05	2.20E+05	1.80E+04	2.30E+04	2.50E+04	4.80E+04	4.80E+05	8.40E+04	9.50E+04	8.50E+03	9.70E+03	1.00E+04	7.70E+03	7.80E+03
TP161	0.1																		
TP165	0.1																		
TP167	0.1																		
TP167	0.5																		
TP169	0.41																		
TP170	0.05																		
TP173	0.7																		
TP176	0.15																		
TP176	0.8																		
TP180	0.1																		
TP180	0.6																		
TP181	0.1																		
TP183	0.05																		
TP183	0.45	0.001	0.001	0.001	0.002	0.001	0.001	0.001	1	2	8	8	0.001	0.001	1	2	10	10	10
TP185	0.3																		
TP187	0.15																		
TP187	0.8	0.001	0.001	0.001	0.002	0.001	0.001	0.001	1	2	8	8	0.001	0.001	1	2	10	10	10
TP189	0.2																		

Location	Sample depth	TPH (>EC35-44) aromatic	Total TPH	Naphthalene	Acenaphthylene	Acenaphthene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene	Benzo(a)anthracene	Chrysene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Benzo(a)pyrene	Indeno(1,2,3-c,d)pyrene	Dibenzo(a,h)anthracene	Benzo(g,hi)perylene	Benzo(a)pyrene (as surrogate marker)	Tetrachloroethene (PCE)	*Trichloroethene (TCE)*	cis-1,2-Dichloroethene	Vinyl Chloride (VC)	1,1,2,2-Tetrachloroethane (PCA)	1,1,1-Trichloroethane (TCA)	1,2-Dichloroethane
Detection Limit		10	10	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05							
GSAC		7.80E+03	5.00E+02	1.90E+03	3.00E+04	3.00E+04	2.00E+04	6.20E+03	1.50E+05	6.30E+03	1.50E+04	5.60E+01	1.10E+02	1.50E+01	4.10E+02	1.20E+01	1.70E+02	1.30E+00	1.50E+03	4.70E+00	1.10E+03	9.10E+01	0.00E+00	5.00E+00	2.10E+03	7.60E+04	2.40E+01
TP161	0.1			0.05	0.05	0.05	0.05	0.23	0.05	0.67	0.69	0.4	0.37	0.39	0.21	0.37	0.05	0.05	0.05	0.37							
TP165	0.1			0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05							
TP167	0.1			0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05							
TP167	0.5			0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05							
TP169	0.41			0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05							
TP170	0.05			0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05							
TP173	0.7			0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05							
TP176	0.15			0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05							
TP176	0.8			0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05							
TP180	0.1			0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05							
TP180	0.6			0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05							
TP181	0.1			0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05							
TP183	0.05																										
TP183	0.45	10	10	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05							
TP185	0.3			0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05							
TP187	0.15			0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05							
TP187	0.8	10	10	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05							
TP189	0.2			0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05							

Location	Sample depth	Carbon Tetrachloride
Detection Limit		
GSAC		2.70E+02
TP161	0.1	
TP165	0.1	
TP167	0.1	
TP167	0.5	
TP169	0.41	
TP170	0.05	
TP173	0.7	
TP176	0.15	
TP176	0.8	
TP180	0.1	
TP180	0.6	
TP181	0.1	
TP183	0.05	
TP183	0.45	
TP185	0.3	
TP187	0.15	
TP187	0.8	
TP189	0.2	

Determinand	Number of tests	Range (mg/kg)	S4UL Public open space (pc	Detection Limit (mg/kg)	Min	Max	No. of Exceedances	No. Non detects	< or not
Arsenic	17	5.3 to 20	1.70E+02	1	5.3	20	0	0	
Barium	17	15 to 89	1.35E+03	1	15	89	0	0	
Beryllium	17	0.42 to 1.7	6.30E+01	0.06	0.42	1.7	0	0	
Boron	17	0.4 to 3.6	4.60E+04	0.2	0.4	3.6	0	0	
Cadmium	17	<0.2 to 1	5.32E+02	0.2	0.2	1	0	14	<
Chromium VI	17	<1.8 to 1.8	2.20E+02	1.8	1.8	1.8	0	17	<
Chromium III	17	7.4 to 39	3.30E+04	1	7.4	39	0	0	
Copper	17	6.1 to 200	4.40E+04	1	6.1	200	0	0	
Lead*	17	6.7 to 99	1.30E+03	1	6.7	99	0	0	
Inorganic Mercury	17	<0.3 to 0.3	2.40E+02	0.3	0.3	0.3	0	17	<
Nickel	17	8.9 to 36	3.40E+03	1	8.9	36	0	0	
Selenium	17	<1 to 1	1.80E+03	1	1	1	0	17	<
Vanadium	17	16 to 65	5.00E+03	1	16	65	0	0	
Zinc	17	26 to 1200	1.70E+05	1	26	1200	0	0	
Cyanide (Free)	17	<1 to 1	4.30E+01	1	1	1	0	17	<
Cyanide (Complex)	17	<1 to 1	2.13E+02	1	1	1	0	17	<
Phenols (Total)	17	<1 to 1	6.90E+02	1	1	1	0	17	<
Benzene	2	<0.001 to 0.001	1.00E+02	0.001	0.001	0.001	0	2	<
Toluene	2	<0.001 to 0.001	9.50E+04	0.001	0.001	0.001	0	2	<
Ethyl benzene	2	<0.001 to 0.001	2.20E+04	0.001	0.001	0.001	0	2	<
Total Xylene	2	0.002 to 0.002	2.30E+04	0.001	0.002	0.002	0	0	
TPH (EC5-6) aliphatic	2	<0.001 to 0.001	1.30E+05	0.001	0.001	0.001	0	2	<
TPH (>EC6-8) aliphatic	2	<0.001 to 0.001	2.20E+05	0.001	0.001	0.001	0	2	<
TPH (>EC8-10) aliphatic	2	<0.001 to 0.001	1.80E+04	0.001	0.001	0.001	0	2	<
TPH (>EC10-12) aliphatic	2	<1 to 1	2.30E+04	1	1	1	0	2	<
TPH (>EC12-16) aliphatic	2	<2 to 2	2.50E+04	2	2	2	0	2	<
TPH (>EC16-21) aliphatic	2	<8 to 8	4.80E+05	8	8	8	0	2	<
TPH (>EC21-35) aliphatic	2	<8 to 8	4.80E+05	8	8	8	0	2	<
TPH (>EC35-44) aliphatic	2	<10 to 10	4.80E+05	10	10	10	0	2	<
TPH (>EC6-7) aromatic (benzene)	2	<0.001 to 0.001	8.40E+04	0.001	0.001	0.001	0	2	<
TPH (>EC7-8) aromatic (toluene)	2	<0.001 to 0.001	9.50E+04	0.001	0.001	0.001	0	2	<
TPH (>EC8-10) aromatic	2	<1 to 1	8.50E+03	1	1	1	0	2	<
TPH (>EC10-12) aromatic	2	<2 to 2	9.70E+03	2	2	2	0	2	<
TPH (>EC12-16) aromatic	2	<10 to 10	1.00E+04	10	10	10	0	2	<
TPH (>EC16-21) aromatic	2	<10 to 10	7.70E+03	10	10	10	0	2	<
TPH (>EC21-35) aromatic	2	<10 to 10	7.80E+03	10	10	10	0	2	<
TPH (>EC35-44) aromatic	2	<10 to 10	7.80E+03	10	10	10	0	2	<
Total TPH	2	<10 to 10	5.00E+02	10	10	10	0	2	<
Naphthalene	17	<0.05 to 0.05	1.90E+03	0.05	0.05	0.05	0	17	<
Acenaphthylene	17	<0.05 to 0.05	3.00E+04	0.05	0.05	0.05	0	17	<
Acenaphthene	17	<0.05 to 0.05	3.00E+04	0.05	0.05	0.05	0	17	<
Fluorene	17	<0.05 to 0.05	2.00E+04	0.05	0.05	0.05	0	17	<
Phenanthrene	17	<0.05 to 0.23	6.20E+03	0.05	0.05	0.23	0	16	<
Anthracene	17	<0.05 to 0.05	1.50E+05	0.05	0.05	0.05	0	17	<
Fluoranthene	17	<0.05 to 0.67	6.30E+03	0.05	0.05	0.67	0	16	<
Pyrene	17	<0.05 to 0.69	1.50E+04	0.05	0.05	0.69	0	16	<
Benzo(a)anthracene	17	<0.05 to 0.4	5.60E+01	0.05	0.05	0.4	0	16	<
Chrysene	17	<0.05 to 0.37	1.10E+02	0.05	0.05	0.37	0	16	<
Benzo(b)fluoranthene	17	<0.05 to 0.39	1.50E+01	0.05	0.05	0.39	0	16	<
Benzo(k)fluoranthene	17	<0.05 to 0.21	4.10E+02	0.05	0.05	0.21	0	16	<
Benzo(a)pyrene	17	<0.05 to 0.37	1.20E+01	0.05	0.05	0.37	0	16	<
Indeno(1,2,3-c,d)pyrene	17	<0.05 to 0.05	1.70E+02	0.05	0.05	0.05	0	17	<
Dibenzo(a,h)anthracene	17	<0.05 to 0.05	1.30E+00	0.05	0.05	0.05	0	17	<
Benzo(g,hi)perylene	17	<0.05 to 0.05	1.50E+03	0.05	0.05	0.05	0	17	<
Coal Tar (B(a)P as surrogate mark	17	<0.05 to 0.37	4.70E+00	0.05	0.05	0.37	0	16	<
Tetrachloroethene (PCE)	0	<0 to 0	1.10E+03	0	0	0	0	200	<
Trichloroethene (TCE)	0	<0 to 0	9.10E+01	0	0	0	0	200	<
cis-1,2-Dichloroethene	0	<0 to 0	0.00E+00	0	0	0	0	200	<
Vinyl Chloride (VC)	0	<0 to 0	5.00E+00	0	0	0	0	200	<
1,1,2,2-Tetrachloroethane (PCA)	0	<0 to 0	2.10E+03	0	0	0	0	200	<

Appendix 5 : Soil Leachate Results

*EQS Standard: Phenol and Benzene annual average of 300µg/l; Toluene 500µg/l for Freshwater, 400µg/l for Saltwater; 1,1,1-TCA 1,000µg/l.

Project Name:	Oxfordshire RFI
Project Number:	NTH2479
Assessment for:	Soil Leachate Assessment
Laboratory:	i2
Receptor:	Drinking Water
Receptor Water Hardness:	>200

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100 = Assessment Criteria Exceedance)
50 = M-BAT Bioavailability Assessment Required

	Contaminant	Units	Detection Limit	Guideline Concentration	Source	Number of Samples	Min	Max	No of Exceedences	TP167	TP173	TP176	TP180	TP183	TP185	TP187
										0.5	0.7	0.8	0.6	0.45	0.3	0.8
Heavy Metals	Arsenic	µg/l	1	10	UK DWS	1	1.30	1.30	0	< 1.0	< 1.0	1.30	< 1.0	< 1.0	< 1.0	< 1.0
	Barium	mg/l	0.05	700	UK DWS	7	7.00	11.00	0	10.00	9.10	11.00	11.00	9.10	9.30	7.00
	Beryllium	µg/l	0.2	None Available		7	0.20	0.30	0	0.30	0.20	0.30	0.30	0.30	0.30	0.30
	Cadmium	µg/l	0.08	3	UK DWS	0	0.00	0.00	0	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08
	Chromium III	µg/l	0.4	4.7	UK DWS	7	0.70	1.60	0	1.20	1.00	1.40	1.60	1.60	1.10	0.70
	Chromium VI	µg/l		3.4	EQS Freshwater	0	0.00	0.00	0							
	Copper	µg/l	0.7	2000	UK DWS	7	4.30	13.00	0	11.00	9.20	9.60	9.70	13.00	5.00	4.30
	Lead	µg/l	1	10	UK DWS	7	3.00	4.90	0	3.40	4.50	4.40	3.00	4.70	4.90	4.70
	Mercury	µg/l	0.5	1	UK DWS	0	0.00	0.00	0	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Nickel	µg/l	0.3	20	UK DWS	7	3.80	5.50	0	4.40	5.30	3.80	5.30	5.30	5.50	4.10
	Selenium	µg/l	4	10	UK DWS	0	0.00	0.00	0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
	Vanadium	µg/l	1.7	None Available		6	2.20	8.00	0	< 1.7	5.10	3.50	3.60	8.00	2.70	2.20
	Zinc	µg/l	0.4	5000	DWS	7	4.80	13.00	0	12.00	8.20	8.30	6.70	13.00	9.90	4.80
	Sulphate	mg/l	0.1	250	DWS	7	2.60	9.80	0	3.30	2.60	2.90	2.70	5.30	9.80	2.90
	Boron	µg/l	10	300	UK DWS	7	17.00	44.00	0	44.00	19.00	21.00	17.00	39.00	24.00	17.00
	pH					0	0.00	0.00	0							
ics	Cyanide (total)	µg/l	10	70	UK DWS	0	0.00	0.00	0	< 10	< 10	< 10	< 10	< 10	< 10	< 10

*EQS Standard: Phenol and Benzene annual average of 300µg/l; Toluene 500µg/l for Freshwater, 400µg/l for Saltwater; 1,1,1-TCA 1,000µg/l.

Project Name:	Oxfordshire RFI
Project Number:	NTH2479
Assessment for:	Soil Leachate Assessment
Laboratory:	i2
Receptor:	Freshwater
Receptor Water Hardness:	>200

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100 = Assessment Criteria Exceedance)
50 = M-BAT Bioavailability Assessment Required

	Contaminant	Units	Detection Limit	Guideline Concentration	Source	Number of Samples	Min	Max	No of Exceedences	TP167	TP173	TP176	TP180	TP183	TP185	TP187
										0.5	0.7	0.8	0.6	0.45	0.3	0.8
Heavy Metals	Arsenic	µg/l	1	50	EQS Freshwater	1	1.30	1.30	0	< 1.0	< 1.0	1.30	< 1.0	< 1.0	< 1.0	< 1.0
	Barium	mg/l	0.05	700	UK DWS	7	7.00	11.00	0	10.00	9.10	11.00	11.00	9.10	9.30	7.00
	Beryllium	µg/l	0.2	None Available		7	0.20	0.30	0	0.30	0.20	0.30	0.30	0.30	0.30	0.30
	Cadmium	µg/l	0.08	0.25	EQS Freshwater	0	0.00	0.00	0	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08
	Chromium III	µg/l	0.4	4.7	EQS Freshwater	7	0.70	1.60	0	1.20	1.00	1.40	1.60	1.60	1.10	0.70
	Chromium VI	µg/l		3.4	EQS Freshwater	0	0.00	0.00	0							
	Copper	µg/l	0.7	1	EQS Freshwater	7	4.30	13.00	**7**	**11.00**	**9.20**	**9.60**	**9.70**	**13.00**	**5.00**	**4.30**
	Lead	µg/l	1	1.2	EQS Freshwater	7	3.00	4.90	7	**3.40**	**4.50**	**4.40**	**3.00**	**4.70**	**4.90**	**4.70**
	Mercury	µg/l	0.5	0.07	EQS Freshwater	0	0.00	0.00	0	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Nickel	µg/l	0.3	4	EQS Freshwater	7	3.80	5.50	**6**	**4.40**	**5.30**	3.80	**5.30**	**5.30**	**5.50**	**4.10**
	Selenium	µg/l	4	10	UK DWS	0	0.00	0.00	0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
	Vanadium	µg/l	1.7	None Available		6	2.20	8.00	0	< 1.7	5.10	3.50	3.60	8.00	2.70	2.20
	Zinc	µg/l	0.4	10.9	EQS Freshwater	7	4.80	13.00	**2**	**12.00**	8.20	8.30	6.70	**13.00**	9.90	4.80
	Sulphate	mg/l	0.1	250	DWS	7	2.60	9.80	0	3.30	2.60	2.90	2.70	5.30	9.80	2.90
	Boron	µg/l	10	2000	EQS Freshwater	7	17.00	44.00	0	44.00	19.00	21.00	17.00	39.00	24.00	17.00
	pH					0	0.00	0.00	0							
ics	Cyanide (total)	µg/l	10	1	EQS Freshwater	0	0.00	0.00	0	< 10	< 10	< 10	< 10	< 10	< 10	< 10

Appendix 6 : Hazwaste Results

HazWasteOnline™

Waste Classification Report

HazWasteOnline™ classifies waste as either **hazardous** or **non-hazardous** based on its chemical composition, related legislation and the rules and data defined in the current UK or EU technical guidance (Appendix C) (note that HP 9 Infectious is not assessed). It is the responsibility of the classifier named below to:

a) understand the origin of the waste
b) select the correct List of Waste code(s)
c) confirm that the list of determinands, results and sampling plan are fit for purpose
d) select and justify the chosen metal species (Appendix B)
e) correctly apply moisture correction and other available corrections
f) add the meta data for their user-defined substances (Appendix A)
g) check that the classification engine is suitable with respect to the national destination of the waste (Appendix C)

To aid the reviewer, the laboratory results, assumptions and justifications managed by the classifier are highlighted in

Job name

NTH2479 Oxfordshire RFI (Road corridors)

Description/Comments

Project

NTH2479 Oxfordshire RFI (Road corridors)

Site

NTH2479 Oxfordshire RFI (Road corridors)

Classified by

Name:
Richard Robinson
Date:
21 Nov 2022 10:54 GMT
Telephone:
0115 924 1100

Company:
BWB Consulting Ltd
Waterfront House, Station Street
Nottingham
NG2 3DQ

HazWasteOnline™ provides a two day, hazardous waste classification course that covers the use of the software and both basic and advanced waste classification techniques. Certification has to be renewed every 3 years.

HazWasteOnline™ Certification: -

Course	**Date**
Hazardous Waste Classification	08 Dec 2016
3 year Refresher overdue	-

Purpose of classification

2 - Material Characterisation

Address of the waste

Bicester OX27 7PQ OX27 7PQ

SIC for the process giving rise to the waste

Description of industry/producer giving rise to the waste

Construction

Description of the specific process, sub-process and/or activity that created the waste

Earthworks

Description of the waste

Soils

Job summary

#	Sample name	Depth [m]	Classification Result	Hazard properties	Page
1	TP161	0.10	Non Hazardous		3
2	TP165	0.10	Non Hazardous		5
3	TP167	0.10	Non Hazardous		7
4	TP167[2]	0.50	Non Hazardous		9
5	TP169	0.41	Non Hazardous		11
6	TP170	0.05	Non Hazardous		13
7	TP173	0.70	Non Hazardous		15
8	TP176	0.15	Non Hazardous		17
9	TP176[2]	0.80	Non Hazardous		19
10	TP180	0.10	Non Hazardous		21
11	TP180[2]	0.60	Non Hazardous		23
12	TP181	0.10	Non Hazardous		25
13	TP183	0.45	Non Hazardous		27
14	TP185	0.30	Non Hazardous		30
15	TP187	0.15	Non Hazardous		32
16	TP187[2]	0.80	Non Hazardous		34
17	TP189	0.20	Hazardous	HP 14	37

Related documents

#	Name	Description
1	BWB Contaminated Land Suite WM3	waste stream template used to create this Job

Report

Created by: Richard Robinson

Created date: 21 Nov 2022 10:54 GMT

Appendices	Page
Appendix A: Classifier defined and non GB MCL determinands	39
Appendix B: Rationale for selection of metal species	40
Appendix C: Version	41

Classification of sample: TP161

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:
TP161
Sample Depth:
0.10 m
Moisture content:
7.2%
(no correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 7.2% No Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	confirm TPH has NOT arisen from diesel or petrol					☑					
2	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		12 mg/kg	1.32	15.844 mg/kg	0.00158 %		
3	beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		1 mg/kg	2.775	2.775 mg/kg	0.000278 %		
4	boron { boron tribromide/trichloride/trifluoride (combined) }			10294-33-4, 10294-34-5, 7637-07-2		3.1 mg/kg	13.43	41.633 mg/kg	0.00416 %		
5	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	<0.2 mg/kg	1.285	<0.257 mg/kg	<0.00002 %		<**LOD**
6	chromium { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		25 mg/kg	1.462	36.539 mg/kg	0.00365 %		
7	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		14 mg/kg	1.126	15.762 mg/kg	0.00158 %		
8	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	25 mg/kg	1.56	38.995 mg/kg	0.0025 %		
9	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.3 mg/kg	1.353	<0.406 mg/kg	<0.0000406 %		<**LOD**
10	nickel { nickel dihydroxide }	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]		18 mg/kg	1.579	28.431 mg/kg	0.00284 %		
11	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<1 mg/kg	1.405	<1.405 mg/kg	<0.000141 %		<**LOD**
12	zinc { zinc sulphate (hydrous) (mono-, hexa- and hepta hydrate); [1] zinc sulphate (anhydrous) [2] }	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]		62 mg/kg	4.398	272.671 mg/kg	0.0273 %		
13	pH			PH		7.5 pH		7.5 pH	7.5 pH		

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
14		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<**LOD**
15		acenaphthene		201-469-6	83-32-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
16		acenaphthylene		205-917-1	208-96-8		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
17		anthracene		204-371-1	120-12-7		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
18		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		0.4	mg/kg		0.4	mg/kg	0.00004 %		
19		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		0.37	mg/kg		0.37	mg/kg	0.000037 %		
20		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		0.39	mg/kg		0.39	mg/kg	0.000039 %		
21		benzo[ghi]perylene		205-883-8	191-24-2		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
22		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		0.21	mg/kg		0.21	mg/kg	0.000021 %		
23		chrysene	601-048-00-0	205-923-4	218-01-9		0.37	mg/kg		0.37	mg/kg	0.000037 %		
24		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
25		fluoranthene		205-912-4	206-44-0		0.67	mg/kg		0.67	mg/kg	0.000067 %		
26		fluorene		201-695-5	86-73-7		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
27		indeno[123-cd]pyrene		205-893-2	193-39-5		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
28		naphthalene	601-052-00-2	202-049-5	91-20-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
29		phenanthrene		201-581-5	85-01-8		0.23	mg/kg		0.23	mg/kg	0.000023 %		
30		pyrene		204-927-3	129-00-0		0.69	mg/kg		0.69	mg/kg	0.000069 %		
31		phenol	604-001-00-2	203-632-7	108-95-2		<1	mg/kg		<1	mg/kg	<0.0001 %		<**LOD**
											Total:	0.0447 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TP165

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:
TP165
Sample Depth:
0.10 m
Moisture content:
12%
(no correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 12% No Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1	confirm TPH has NOT arisen from diesel or petrol					☑							
2	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		11	mg/kg	1.32	14.524	mg/kg	0.00145 %		
3	beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		1.3	mg/kg	2.775	3.608	mg/kg	0.000361 %		
4	boron { boron tribromide/trichloride/trifluoride (combined) }			10294-33-4, 10294-34-5, 7637-07-2		3.6	mg/kg	13.43	48.348	mg/kg	0.00483 %		
5	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	0.4	mg/kg	1.285	0.514	mg/kg	0.00004 %		
6	chromium { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		31	mg/kg	1.462	45.308	mg/kg	0.00453 %		
7	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		13	mg/kg	1.126	14.637	mg/kg	0.00146 %		
8	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	22	mg/kg	1.56	34.316	mg/kg	0.0022 %		
9	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<**LOD**
10	nickel { nickel dihydroxide }	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]		20	mg/kg	1.579	31.59	mg/kg	0.00316 %		
11	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<1	mg/kg	1.405	<1.405	mg/kg	<0.000141 %		<**LOD**
12	zinc { zinc sulphate (hydrous) (mono-, hexa- and hepta hydrate); [1] zinc sulphate (anhydrous) [2] }	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]		69	mg/kg	4.398	303.457	mg/kg	0.0303 %		
13	pH			PH		8	pH		8	pH	8pH		

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
14		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<LOD
15		acenaphthene		201-469-6	83-32-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
16		acenaphthylene		205-917-1	208-96-8		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
17		anthracene		204-371-1	120-12-7		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
18		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
19		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
20		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
21		benzo[ghi]perylene		205-883-8	191-24-2		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
22		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
23		chrysene	601-048-00-0	205-923-4	218-01-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
24		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
25		fluoranthene		205-912-4	206-44-0		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
26		fluorene		201-695-5	86-73-7		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
27		indeno[123-cd]pyrene		205-893-2	193-39-5		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
28		naphthalene	601-052-00-2	202-049-5	91-20-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
29		phenanthrene		201-581-5	85-01-8		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
30		pyrene		204-927-3	129-00-0		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
31		phenol	604-001-00-2	203-632-7	108-95-2		<1	mg/kg		<1	mg/kg	<0.0001 %		<LOD
											Total:	0.0489 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TP167

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:
TP167
Sample Depth:
0.10 m
Moisture content:
8.2%
(no correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 8.2% No Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1	confirm TPH has NOT arisen from diesel or petrol					☑							
2	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		12	mg/kg	1.32	15.844	mg/kg	0.00158 %		
3	beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		1.6	mg/kg	2.775	4.441	mg/kg	0.000444 %		
4	boron { boron tribromide/trichloride/trifluoride (combined) }			10294-33-4, 10294-34-5, 7637-07-2		2.7	mg/kg	13.43	36.261	mg/kg	0.00363 %		
5	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	0.6	mg/kg	1.285	0.771	mg/kg	0.00006 %		
6	chromium { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		39	mg/kg	1.462	57.001	mg/kg	0.0057 %		
7	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		28	mg/kg	1.126	31.525	mg/kg	0.00315 %		
8	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	32	mg/kg	1.56	49.914	mg/kg	0.0032 %		
9	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<**LOD**
10	nickel { nickel dihydroxide }	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]		24	mg/kg	1.579	37.908	mg/kg	0.00379 %		
11	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<1	mg/kg	1.405	<1.405	mg/kg	<0.000141 %		<**LOD**
12	zinc { zinc sulphate (hydrous) (mono-, hexa- and hepta hydrate); [1] zinc sulphate (anhydrous) [2] }	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]		280	mg/kg	4.398	1231.419	mg/kg	0.123 %		
13	pH			PH		7.8	pH		7.8	pH	7.8 pH		

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
14		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<**LOD**
		006-007-00-5											
15		acenaphthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			201-469-6	83-32-9									
16		acenaphthylene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			205-917-1	208-96-8									
17		anthracene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			204-371-1	120-12-7									
18		benzo[a]anthracene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-033-00-9	200-280-6	56-55-3									
19		benzo[a]pyrene; benzo[def]chrysene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-032-00-3	200-028-5	50-32-8									
20		benzo[b]fluoranthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-034-00-4	205-911-9	205-99-2									
21		benzo[ghi]perylene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			205-883-8	191-24-2									
22		benzo[k]fluoranthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-036-00-5	205-916-6	207-08-9									
23		chrysene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-048-00-0	205-923-4	218-01-9									
24		dibenz[a,h]anthracene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-041-00-2	200-181-8	53-70-3									
25		fluoranthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			205-912-4	206-44-0									
26		fluorene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			201-695-5	86-73-7									
27		indeno[123-cd]pyrene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			205-893-2	193-39-5									
28		naphthalene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-052-00-2	202-049-5	91-20-3									
29		phenanthrene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			201-581-5	85-01-8									
30		pyrene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			204-927-3	129-00-0									
31		phenol				<1	mg/kg		<1	mg/kg	<0.0001 %		<**LOD**
		604-001-00-2	203-632-7	108-95-2									
										Total:	0.145 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TP167[2]

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:
TP167[2]
Sample Depth:
0.50 m
Moisture content:
13%
(no correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 13% No Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	confirm TPH has NOT arisen from diesel or petrol					☑					
2	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		11 mg/kg	1.32	14.524 mg/kg	0.00145 %		
3	beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		1.4 mg/kg	2.775	3.885 mg/kg	0.000389 %		
4	boron { boron tribromide/trichloride/trifluoride (combined) }			10294-33-4, 10294-34-5, 7637-07-2		2.5 mg/kg	13.43	33.575 mg/kg	0.00336 %		
5	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	<0.2 mg/kg	1.285	<0.257 mg/kg	<0.00002 %		<LOD
6	chromium { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		32 mg/kg	1.462	46.77 mg/kg	0.00468 %		
7	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		11 mg/kg	1.126	12.385 mg/kg	0.00124 %		
8	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	18 mg/kg	1.56	28.077 mg/kg	0.0018 %		
9	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.3 mg/kg	1.353	<0.406 mg/kg	<0.0000406 %		<LOD
10	nickel { nickel dihydroxide }	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]		23 mg/kg	1.579	36.328 mg/kg	0.00363 %		
11	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<1 mg/kg	1.405	<1.405 mg/kg	<0.000141 %		<LOD
12	zinc { zinc sulphate (hydrous) (mono-, hexa- and hepta hydrate); [1] zinc sulphate (anhydrous) [2] }	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]		62 mg/kg	4.398	272.671 mg/kg	0.0273 %		
13	pH			PH		8.4 pH		8.4 pH	8.4 pH		

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
14		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<LOD
		006-007-00-5											
15		acenaphthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
			201-469-6	83-32-9									
16		acenaphthylene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
			205-917-1	208-96-8									
17		anthracene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
			204-371-1	120-12-7									
18		benzo[a]anthracene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
		601-033-00-9	200-280-6	56-55-3									
19		benzo[a]pyrene; benzo[def]chrysene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
		601-032-00-3	200-028-5	50-32-8									
20		benzo[b]fluoranthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
		601-034-00-4	205-911-9	205-99-2									
21		benzo[ghi]perylene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
			205-883-8	191-24-2									
22		benzo[k]fluoranthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
		601-036-00-5	205-916-6	207-08-9									
23		chrysene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
		601-048-00-0	205-923-4	218-01-9									
24		dibenz[a,h]anthracene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
		601-041-00-2	200-181-8	53-70-3									
25		fluoranthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
			205-912-4	206-44-0									
26		fluorene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
			201-695-5	86-73-7									
27		indeno[123-cd]pyrene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
			205-893-2	193-39-5									
28		naphthalene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
		601-052-00-2	202-049-5	91-20-3									
29		phenanthrene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
			201-581-5	85-01-8									
30		pyrene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
			204-927-3	129-00-0									
31		phenol				<1	mg/kg		<1	mg/kg	<0.0001 %		<LOD
		604-001-00-2	203-632-7	108-95-2									
										Total:	0.0444 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TP169

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:
TP169
Sample Depth:
0.41 m
Moisture content:
9%
(no correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 9% No Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	confirm TPH has NOT arisen from diesel or petrol					☑					
2	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		11 mg/kg	1.32	14.524 mg/kg	0.00145 %		
3	beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		1.2 mg/kg	2.775	3.33 mg/kg	0.000333 %		
4	boron { boron tribromide/trichloride/trifluoride (combined) }			10294-33-4, 10294-34-5, 7637-07-2		1.6 mg/kg	13.43	21.488 mg/kg	0.00215 %		
5	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	<0.2 mg/kg	1.285	<0.257 mg/kg	<0.00002 %		<**LOD**
6	chromium { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		30 mg/kg	1.462	43.847 mg/kg	0.00438 %		
7	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		8.6 mg/kg	1.126	9.683 mg/kg	0.000968 %		
8	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	11 mg/kg	1.56	17.158 mg/kg	0.0011 %		
9	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.3 mg/kg	1.353	<0.406 mg/kg	<0.0000406 %		<**LOD**
10	nickel { nickel dihydroxide }	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]		20 mg/kg	1.579	31.59 mg/kg	0.00316 %		
11	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<1 mg/kg	1.405	<1.405 mg/kg	<0.000141 %		<**LOD**
12	zinc { zinc sulphate (hydrous) (mono-, hexa- and hepta hydrate); [1] zinc sulphate (anhydrous) [2] }	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]		40 mg/kg	4.398	175.917 mg/kg	0.0176 %		
13	pH			PH		8.1 pH		8.1 pH	8.1 pH		

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
14		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<LOD
		006-007-00-5											
15		acenaphthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
			201-469-6	83-32-9									
16		acenaphthylene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
			205-917-1	208-96-8									
17		anthracene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
			204-371-1	120-12-7									
18		benzo[a]anthracene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
		601-033-00-9	200-280-6	56-55-3									
19		benzo[a]pyrene; benzo[def]chrysene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
		601-032-00-3	200-028-5	50-32-8									
20		benzo[b]fluoranthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
		601-034-00-4	205-911-9	205-99-2									
21		benzo[ghi]perylene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
			205-883-8	191-24-2									
22		benzo[k]fluoranthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
		601-036-00-5	205-916-6	207-08-9									
23		chrysene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
		601-048-00-0	205-923-4	218-01-9									
24		dibenz[a,h]anthracene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
		601-041-00-2	200-181-8	53-70-3									
25		fluoranthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
			205-912-4	206-44-0									
26		fluorene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
			201-695-5	86-73-7									
27		indeno[123-cd]pyrene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
			205-893-2	193-39-5									
28		naphthalene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
		601-052-00-2	202-049-5	91-20-3									
29		phenanthrene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
			201-581-5	85-01-8									
30		pyrene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
			204-927-3	129-00-0									
31		phenol				<1	mg/kg		<1	mg/kg	<0.0001 %		<LOD
		604-001-00-2	203-632-7	108-95-2									
										Total:	0.0317 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TP170

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:
TP170
Sample Depth:
0.05 m
Moisture content:
8.7%
(no correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 8.7% No Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	confirm TPH has NOT arisen from diesel or petrol					☑					
2	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		15 mg/kg	1.32	19.805 mg/kg	0.00198 %		
3	beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		1.3 mg/kg	2.775	3.608 mg/kg	0.000361 %		
4	boron { boron tribromide/trichloride/trifluoride (combined) }			10294-33-4, 10294-34-5, 7637-07-2		2.8 mg/kg	13.43	37.604 mg/kg	0.00376 %		
5	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	<0.2 mg/kg	1.285	<0.257 mg/kg	<0.00002 %		<**LOD**
6	chromium { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		33 mg/kg	1.462	48.231 mg/kg	0.00482 %		
7	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		18 mg/kg	1.126	20.266 mg/kg	0.00203 %		
8	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	28 mg/kg	1.56	43.675 mg/kg	0.0028 %		
9	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.3 mg/kg	1.353	<0.406 mg/kg	<0.0000406 %		<**LOD**
10	nickel { nickel dihydroxide }	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]		25 mg/kg	1.579	39.487 mg/kg	0.00395 %		
11	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<1 mg/kg	1.405	<1.405 mg/kg	<0.000141 %		<**LOD**
12	zinc { zinc sulphate (hydrous) (mono-, hexa- and hepta hydrate); [1] zinc sulphate (anhydrous) [2] }	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]		70 mg/kg	4.398	307.855 mg/kg	0.0308 %		
13	pH			PH		7.8 pH		7.8 pH	7.8 pH		

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
14		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<**LOD**
		006-007-00-5											
15		acenaphthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			201-469-6	83-32-9									
16		acenaphthylene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			205-917-1	208-96-8									
17		anthracene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			204-371-1	120-12-7									
18		benzo[a]anthracene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-033-00-9	200-280-6	56-55-3									
19		benzo[a]pyrene; benzo[def]chrysene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-032-00-3	200-028-5	50-32-8									
20		benzo[b]fluoranthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-034-00-4	205-911-9	205-99-2									
21		benzo[ghi]perylene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			205-883-8	191-24-2									
22		benzo[k]fluoranthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-036-00-5	205-916-6	207-08-9									
23		chrysene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-048-00-0	205-923-4	218-01-9									
24		dibenz[a,h]anthracene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-041-00-2	200-181-8	53-70-3									
25		fluoranthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			205-912-4	206-44-0									
26		fluorene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			201-695-5	86-73-7									
27		indeno[123-cd]pyrene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			205-893-2	193-39-5									
28		naphthalene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-052-00-2	202-049-5	91-20-3									
29		phenanthrene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			201-581-5	85-01-8									
30		pyrene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			204-927-3	129-00-0									
31		phenol				<1	mg/kg		<1	mg/kg	<0.0001 %		<**LOD**
		604-001-00-2	203-632-7	108-95-2									
										Total:	0.0511 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TP173

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:
TP173
Sample Depth:
0.70 m
Moisture content:
6.7%
(no correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 6.7% No Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	confirm TPH has NOT arisen from diesel or petrol					☑					
2	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		6.5 mg/kg	1.32	8.582 mg/kg	0.000858 %		
3	beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		0.49 mg/kg	2.775	1.36 mg/kg	0.000136 %		
4	boron { boron tribromide/trichloride/trifluoride (combined) }			10294-33-4, 10294-34-5, 7637-07-2		0.4 mg/kg	13.43	5.372 mg/kg	0.000537 %		
5	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	<0.2 mg/kg	1.285	<0.257 mg/kg	<0.00002 %		<LOD
6	chromium { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		13 mg/kg	1.462	19 mg/kg	0.0019 %		
7	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		7.2 mg/kg	1.126	8.106 mg/kg	0.000811 %		
8	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	6.7 mg/kg	1.56	10.451 mg/kg	0.00067 %		
9	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.3 mg/kg	1.353	<0.406 mg/kg	<0.0000406 %		<LOD
10	nickel { nickel dihydroxide }	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]		9.7 mg/kg	1.579	15.321 mg/kg	0.00153 %		
11	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<1 mg/kg	1.405	<1.405 mg/kg	<0.000141 %		<LOD
12	zinc { zinc sulphate (hydrous) (mono-, hexa- and hepta hydrate); [1] zinc sulphate (anhydrous) [2] }	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]		28 mg/kg	4.398	123.142 mg/kg	0.0123 %		
13	pH			PH		8.7 pH		8.7 pH	8.7 pH		

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
14		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<LOD
		006-007-00-5											
15		acenaphthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
			201-469-6	83-32-9									
16		acenaphthylene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
			205-917-1	208-96-8									
17		anthracene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
			204-371-1	120-12-7									
18		benzo[a]anthracene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
		601-033-00-9	200-280-6	56-55-3									
19		benzo[a]pyrene; benzo[def]chrysene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
		601-032-00-3	200-028-5	50-32-8									
20		benzo[b]fluoranthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
		601-034-00-4	205-911-9	205-99-2									
21		benzo[ghi]perylene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
			205-883-8	191-24-2									
22		benzo[k]fluoranthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
		601-036-00-5	205-916-6	207-08-9									
23		chrysene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
		601-048-00-0	205-923-4	218-01-9									
24		dibenz[a,h]anthracene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
		601-041-00-2	200-181-8	53-70-3									
25		fluoranthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
			205-912-4	206-44-0									
26		fluorene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
			201-695-5	86-73-7									
27		indeno[123-cd]pyrene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
			205-893-2	193-39-5									
28		naphthalene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
		601-052-00-2	202-049-5	91-20-3									
29		phenanthrene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
			201-581-5	85-01-8									
30		pyrene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
			204-927-3	129-00-0									
31		phenol				<1	mg/kg		<1	mg/kg	<0.0001 %		<LOD
		604-001-00-2	203-632-7	108-95-2									
										Total:	0.0193 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TP176

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:
TP176
Sample Depth:
0.15 m
Moisture content:
11%
(no correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 11% No Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1	confirm TPH has NOT arisen from diesel or petrol					☑							
2	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		16	mg/kg	1.32	21.125	mg/kg	0.00211 %		
3	beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		1.2	mg/kg	2.775	3.33	mg/kg	0.000333 %		
4	boron { boron tribromide/trichloride/trifluoride (combined) }			10294-33-4, 10294-34-5, 7637-07-2		1.6	mg/kg	13.43	21.488	mg/kg	0.00215 %		
5	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	<0.2	mg/kg	1.285	<0.257	mg/kg	<0.00002 %		<**LOD**
6	chromium { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		30	mg/kg	1.462	43.847	mg/kg	0.00438 %		
7	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		13	mg/kg	1.126	14.637	mg/kg	0.00146 %		
8	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	26	mg/kg	1.56	40.555	mg/kg	0.0026 %		
9	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<**LOD**
10	nickel { nickel dihydroxide }	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]		25	mg/kg	1.579	39.487	mg/kg	0.00395 %		
11	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<1	mg/kg	1.405	<1.405	mg/kg	<0.000141 %		<**LOD**
12	zinc { zinc sulphate (hydrous) (mono-, hexa- and hepta hydrate); [1] zinc sulphate (anhydrous) [2] }	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]		68	mg/kg	4.398	299.059	mg/kg	0.0299 %		
13	pH			PH		7.8	pH		7.8	pH	7.8 pH		

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
14		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<LOD
		006-007-00-5											
15		acenaphthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
			201-469-6	83-32-9									
16		acenaphthylene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
			205-917-1	208-96-8									
17		anthracene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
			204-371-1	120-12-7									
18		benzo[a]anthracene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
		601-033-00-9	200-280-6	56-55-3									
19		benzo[a]pyrene; benzo[def]chrysene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
		601-032-00-3	200-028-5	50-32-8									
20		benzo[b]fluoranthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
		601-034-00-4	205-911-9	205-99-2									
21		benzo[ghi]perylene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
			205-883-8	191-24-2									
22		benzo[k]fluoranthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
		601-036-00-5	205-916-6	207-08-9									
23		chrysene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
		601-048-00-0	205-923-4	218-01-9									
24		dibenz[a,h]anthracene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
		601-041-00-2	200-181-8	53-70-3									
25		fluoranthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
			205-912-4	206-44-0									
26		fluorene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
			201-695-5	86-73-7									
27		indeno[123-cd]pyrene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
			205-893-2	193-39-5									
28		naphthalene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
		601-052-00-2	202-049-5	91-20-3									
29		phenanthrene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
			201-581-5	85-01-8									
30		pyrene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
			204-927-3	129-00-0									
31		phenol				<1	mg/kg		<1	mg/kg	<0.0001 %		<LOD
		604-001-00-2	203-632-7	108-95-2									
										Total:	0.0475 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TP176[2]

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:
TP176[2]
Sample Depth:
0.80 m
Moisture content:
6.9%
(no correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 6.9% No Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	confirm TPH has NOT arisen from diesel or petrol					☑					
2	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		5.3 mg/kg	1.32	6.998 mg/kg	0.0007 %		
3	beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		0.48 mg/kg	2.775	1.332 mg/kg	0.000133 %		
4	boron { boron tribromide/trichloride/trifluoride (combined) }			10294-33-4, 10294-34-5, 7637-07-2		0.5 mg/kg	13.43	6.715 mg/kg	0.000672 %		
5	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	<0.2 mg/kg	1.285	<0.257 mg/kg	<0.00002 %		<**LOD**
6	chromium { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		12 mg/kg	1.462	17.539 mg/kg	0.00175 %		
7	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		6.1 mg/kg	1.126	6.868 mg/kg	0.000687 %		
8	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	6.7 mg/kg	1.56	10.451 mg/kg	0.00067 %		
9	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.3 mg/kg	1.353	<0.406 mg/kg	<0.0000406 %		<**LOD**
10	nickel { nickel dihydroxide }	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]		8.9 mg/kg	1.579	14.058 mg/kg	0.00141 %		
11	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<1 mg/kg	1.405	<1.405 mg/kg	<0.000141 %		<**LOD**
12	zinc { zinc sulphate (hydrous) (mono-, hexa- and hepta hydrate); [1] zinc sulphate (anhydrous) [2] }	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]		26 mg/kg	4.398	114.346 mg/kg	0.0114 %		
13	pH			PH		8.7 pH		8.7 pH	8.7 pH		

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
14		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<LOD
		006-007-00-5											
15		acenaphthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
			201-469-6	83-32-9									
16		acenaphthylene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
			205-917-1	208-96-8									
17		anthracene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
			204-371-1	120-12-7									
18		benzo[a]anthracene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
		601-033-00-9	200-280-6	56-55-3									
19		benzo[a]pyrene; benzo[def]chrysene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
		601-032-00-3	200-028-5	50-32-8									
20		benzo[b]fluoranthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
		601-034-00-4	205-911-9	205-99-2									
21		benzo[ghi]perylene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
			205-883-8	191-24-2									
22		benzo[k]fluoranthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
		601-036-00-5	205-916-6	207-08-9									
23		chrysene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
		601-048-00-0	205-923-4	218-01-9									
24		dibenz[a,h]anthracene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
		601-041-00-2	200-181-8	53-70-3									
25		fluoranthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
			205-912-4	206-44-0									
26		fluorene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
			201-695-5	86-73-7									
27		indeno[123-cd]pyrene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
			205-893-2	193-39-5									
28		naphthalene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
		601-052-00-2	202-049-5	91-20-3									
29		phenanthrene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
			201-581-5	85-01-8									
30		pyrene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
			204-927-3	129-00-0									
31		phenol				<1	mg/kg		<1	mg/kg	<0.0001 %		<LOD
		604-001-00-2	203-632-7	108-95-2									
										Total:	0.018 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TP180

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:
TP180
Sample Depth:
0.10 m
Moisture content:
8.5%
(no correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 8.5% No Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	confirm TPH has NOT arisen from diesel or petrol					☑					
2	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		18 mg/kg	1.32	23.766 mg/kg	0.00238 %		
3	beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		1 mg/kg	2.775	2.775 mg/kg	0.000278 %		
4	boron { boron tribromide/trichloride/trifluoride (combined) }			10294-33-4, 10294-34-5, 7637-07-2		2.8 mg/kg	13.43	37.604 mg/kg	0.00376 %		
5	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	<0.2 mg/kg	1.285	<0.257 mg/kg	<0.00002 %		<**LOD**
6	chromium { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		29 mg/kg	1.462	42.385 mg/kg	0.00424 %		
7	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		15 mg/kg	1.126	16.888 mg/kg	0.00169 %		
8	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	24 mg/kg	1.56	37.436 mg/kg	0.0024 %		
9	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.3 mg/kg	1.353	<0.406 mg/kg	<0.0000406 %		<**LOD**
10	nickel { nickel dihydroxide }	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]		22 mg/kg	1.579	34.749 mg/kg	0.00347 %		
11	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<1 mg/kg	1.405	<1.405 mg/kg	<0.000141 %		<**LOD**
12	zinc { zinc sulphate (hydrous) (mono-, hexa- and hepta hydrate); [1] zinc sulphate (anhydrous) [2] }	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]		74 mg/kg	4.398	325.447 mg/kg	0.0325 %		
13	pH			PH		8 pH		8 pH	8pH		

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
14		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<LOD
15		acenaphthene		201-469-6	83-32-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
16		acenaphthylene		205-917-1	208-96-8		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
17		anthracene		204-371-1	120-12-7		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
18		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
19		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
20		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
21		benzo[ghi]perylene		205-883-8	191-24-2		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
22		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
23		chrysene	601-048-00-0	205-923-4	218-01-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
24		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
25		fluoranthene		205-912-4	206-44-0		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
26		fluorene		201-695-5	86-73-7		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
27		indeno[123-cd]pyrene		205-893-2	193-39-5		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
28		naphthalene	601-052-00-2	202-049-5	91-20-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
29		phenanthrene		201-581-5	85-01-8		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
30		pyrene		204-927-3	129-00-0		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
31		phenol	604-001-00-2	203-632-7	108-95-2		<1	mg/kg		<1	mg/kg	<0.0001 %		<LOD
											Total:	0.0513 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TP180[2]

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:
TP180[2]
Sample Depth:
0.60 m
Moisture content:
6.4%
(no correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 6.4% No Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	confirm TPH has NOT arisen from diesel or petrol					☑					
2	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		12 mg/kg	1.32	15.844 mg/kg	0.00158 %		
3	beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		0.42 mg/kg	2.775	1.166 mg/kg	0.000117 %		
4	boron { boron tribromide/trichloride/trifluoride (combined) }			10294-33-4, 10294-34-5, 7637-07-2		0.8 mg/kg	13.43	10.744 mg/kg	0.00107 %		
5	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	<0.2 mg/kg	1.285	<0.257 mg/kg	<0.00002 %		<LOD
6	chromium { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		12 mg/kg	1.462	17.539 mg/kg	0.00175 %		
7	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		11 mg/kg	1.126	12.385 mg/kg	0.00124 %		
8	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	11 mg/kg	1.56	17.158 mg/kg	0.0011 %		
9	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.3 mg/kg	1.353	<0.406 mg/kg	<0.0000406 %		<LOD
10	nickel { nickel dihydroxide }	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]		11 mg/kg	1.579	17.374 mg/kg	0.00174 %		
11	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<1 mg/kg	1.405	<1.405 mg/kg	<0.000141 %		<LOD
12	zinc { zinc sulphate (hydrous) (mono-, hexa- and hepta hydrate); [1] zinc sulphate (anhydrous) [2] }	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]		76 mg/kg	4.398	334.242 mg/kg	0.0334 %		
13	pH			PH		8.6 pH		8.6 pH	8.6 pH		

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
14		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<LOD
		006-007-00-5											
15		acenaphthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
			201-469-6	83-32-9									
16		acenaphthylene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
			205-917-1	208-96-8									
17		anthracene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
			204-371-1	120-12-7									
18		benzo[a]anthracene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
		601-033-00-9	200-280-6	56-55-3									
19		benzo[a]pyrene; benzo[def]chrysene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
		601-032-00-3	200-028-5	50-32-8									
20		benzo[b]fluoranthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
		601-034-00-4	205-911-9	205-99-2									
21		benzo[ghi]perylene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
			205-883-8	191-24-2									
22		benzo[k]fluoranthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
		601-036-00-5	205-916-6	207-08-9									
23		chrysene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
		601-048-00-0	205-923-4	218-01-9									
24		dibenz[a,h]anthracene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
		601-041-00-2	200-181-8	53-70-3									
25		fluoranthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
			205-912-4	206-44-0									
26		fluorene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
			201-695-5	86-73-7									
27		indeno[123-cd]pyrene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
			205-893-2	193-39-5									
28		naphthalene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
		601-052-00-2	202-049-5	91-20-3									
29		phenanthrene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
			201-581-5	85-01-8									
30		pyrene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
			204-927-3	129-00-0									
31		phenol				<1	mg/kg		<1	mg/kg	<0.0001 %		<LOD
		604-001-00-2	203-632-7	108-95-2									
										Total:	0.0426 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TP181

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:
TP181
Sample Depth:
0.10 m
Moisture content:
7.9%
(no correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 7.9% No Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	confirm TPH has NOT arisen from diesel or petrol					☑					
2	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		19 mg/kg	1.32	25.086 mg/kg	0.00251 %		
3	beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		1.1 mg/kg	2.775	3.053 mg/kg	0.000305 %		
4	boron { boron tribromide/trichloride/trifluoride (combined) }			10294-33-4, 10294-34-5, 7637-07-2		1.5 mg/kg	13.43	20.145 mg/kg	0.00201 %		
5	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	<0.2 mg/kg	1.285	<0.257 mg/kg	<0.00002 %		<**LOD**
6	chromium { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		29 mg/kg	1.462	42.385 mg/kg	0.00424 %		
7	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		12 mg/kg	1.126	13.511 mg/kg	0.00135 %		
8	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	19 mg/kg	1.56	29.636 mg/kg	0.0019 %		
9	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.3 mg/kg	1.353	<0.406 mg/kg	<0.0000406 %		<**LOD**
10	nickel { nickel dihydroxide }	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]		21 mg/kg	1.579	33.169 mg/kg	0.00332 %		
11	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<1 mg/kg	1.405	<1.405 mg/kg	<0.000141 %		<**LOD**
12	zinc { zinc sulphate (hydrous) (mono-, hexa- and hepta hydrate); [1] zinc sulphate (anhydrous) [2] }	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]		51 mg/kg	4.398	224.294 mg/kg	0.0224 %		
13	pH			PH		8.2 pH		8.2 pH	8.2 pH		

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
14		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<LOD
15		acenaphthene		201-469-6	83-32-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
16		acenaphthylene		205-917-1	208-96-8		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
17		anthracene		204-371-1	120-12-7		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
18		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
19		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
20		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
21		benzo[ghi]perylene		205-883-8	191-24-2		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
22		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
23		chrysene	601-048-00-0	205-923-4	218-01-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
24		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
25		fluoranthene		205-912-4	206-44-0		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
26		fluorene		201-695-5	86-73-7		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
27		indeno[123-cd]pyrene		205-893-2	193-39-5		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
28		naphthalene	601-052-00-2	202-049-5	91-20-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
29		phenanthrene		201-581-5	85-01-8		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
30		pyrene		204-927-3	129-00-0		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
31		phenol	604-001-00-2	203-632-7	108-95-2		<1	mg/kg		<1	mg/kg	<0.0001 %		<LOD
											Total:	0.0386 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TP183

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:
TP183
Sample Depth:
0.45 m
Moisture content:
8.1%
(no correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 8.1% No Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	confirm TPH has NOT arisen from diesel or petrol					☑					
2	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		8.7 mg/kg	1.32	11.487 mg/kg	0.00115 %		
3	beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		1.3 mg/kg	2.775	3.608 mg/kg	0.000361 %		
4	boron { boron tribromide/trichloride/trifluoride (combined) }			10294-33-4, 10294-34-5, 7637-07-2		0.8 mg/kg	13.43	10.744 mg/kg	0.00107 %		
5	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	<0.2 mg/kg	1.285	<0.257 mg/kg	<0.00002 %		<**LOD**
6	chromium { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		29 mg/kg	1.462	42.385 mg/kg	0.00424 %		
7	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		21 mg/kg	1.126	23.644 mg/kg	0.00236 %		
8	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	19 mg/kg	1.56	29.636 mg/kg	0.0019 %		
9	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.3 mg/kg	1.353	<0.406 mg/kg	<0.0000406 %		<**LOD**
10	nickel { nickel dihydroxide }	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]		22 mg/kg	1.579	34.749 mg/kg	0.00347 %		
11	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<1 mg/kg	1.405	<1.405 mg/kg	<0.000141 %		<**LOD**
12	zinc { zinc sulphate (hydrous) (mono-, hexa- and hepta hydrate); [1] zinc sulphate (anhydrous) [2] }	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]		130 mg/kg	4.398	571.73 mg/kg	0.0572 %		
13	pH			PH		8.5 pH		8.5 pH	8.5 pH		

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
14		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<**LOD**
15		benzene	601-020-00-8	200-753-7	71-43-2		<1	mg/kg		<1	mg/kg	<0.0001 %		<**LOD**
16		ethylbenzene	601-023-00-4	202-849-4	100-41-4		<1	mg/kg		<1	mg/kg	<0.0001 %		<**LOD**
17		toluene	601-021-00-3	203-625-9	108-88-3		<1	mg/kg		<1	mg/kg	<0.0001 %		<**LOD**
18		xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<1	mg/kg		<1	mg/kg	<0.0001 %		<**LOD**
19		acenaphthene		201-469-6	83-32-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
20		acenaphthylene		205-917-1	208-96-8		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
21		anthracene		204-371-1	120-12-7		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
22		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
23		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
24		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
25		benzo[ghi]perylene		205-883-8	191-24-2		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
26		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
27		chrysene	601-048-00-0	205-923-4	218-01-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
28		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
29		fluoranthene		205-912-4	206-44-0		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
30		fluorene		201-695-5	86-73-7		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
31		indeno[123-cd]pyrene		205-893-2	193-39-5		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
32		naphthalene	601-052-00-2	202-049-5	91-20-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
33		phenanthrene		201-581-5	85-01-8		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
34		pyrene		204-927-3	129-00-0		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
35		phenol	604-001-00-2	203-632-7	108-95-2		<1	mg/kg		<1	mg/kg	<0.0001 %		<**LOD**
											Total:	0.0727 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TP185

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:
TP185
Sample Depth:
0.30 m
Moisture content:
15%
(no correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 15% No Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	confirm TPH has NOT arisen from diesel or petrol					☑					
2	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		6.3 mg/kg	1.32	8.318 mg/kg	0.000832 %		
3	beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		1.7 mg/kg	2.775	4.718 mg/kg	0.000472 %		
4	boron { boron tribromide/trichloride/trifluoride (combined) }			10294-33-4, 10294-34-5, 7637-07-2		1.2 mg/kg	13.43	16.116 mg/kg	0.00161 %		
5	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	<0.2 mg/kg	1.285	<0.257 mg/kg	<0.00002 %		<LOD
6	chromium { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		33 mg/kg	1.462	48.231 mg/kg	0.00482 %		
7	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		60 mg/kg	1.126	67.553 mg/kg	0.00676 %		
8	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	42 mg/kg	1.56	65.512 mg/kg	0.0042 %		
9	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.3 mg/kg	1.353	<0.406 mg/kg	<0.0000406 %		<LOD
10	nickel { nickel dihydroxide }	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]		30 mg/kg	1.579	47.385 mg/kg	0.00474 %		
11	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<1 mg/kg	1.405	<1.405 mg/kg	<0.000141 %		<LOD
12	zinc { zinc sulphate (hydrous) (mono-, hexa- and hepta hydrate); [1] zinc sulphate (anhydrous) [2] }	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]		260 mg/kg	4.398	1143.461 mg/kg	0.114 %		
13	pH			PH		8.1 pH		8.1 pH	8.1 pH		

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
14		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				<1 mg/kg	1.884	<1.884 mg/kg	<0.000188 %		<**LOD**
15		acenaphthene		201-469-6	83-32-9		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<**LOD**
16		acenaphthylene		205-917-1	208-96-8		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<**LOD**
17		anthracene		204-371-1	120-12-7		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<**LOD**
18		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<**LOD**
19		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<**LOD**
20		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<**LOD**
21		benzo[ghi]perylene		205-883-8	191-24-2		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<**LOD**
22		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<**LOD**
23		chrysene	601-048-00-0	205-923-4	218-01-9		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<**LOD**
24		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<**LOD**
25		fluoranthene		205-912-4	206-44-0		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<**LOD**
26		fluorene		201-695-5	86-73-7		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<**LOD**
27		indeno[123-cd]pyrene		205-893-2	193-39-5		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<**LOD**
28		naphthalene	601-052-00-2	202-049-5	91-20-3		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<**LOD**
29		phenanthrene		201-581-5	85-01-8		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<**LOD**
30		pyrene		204-927-3	129-00-0		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<**LOD**
31		phenol	604-001-00-2	203-632-7	108-95-2		<1 mg/kg		<1 mg/kg	<0.0001 %		<**LOD**
									Total:	0.138 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TP187

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:
TP187
Sample Depth:
0.15 m
Moisture content:
8.8%
(no correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 8.8% No Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	confirm TPH has NOT arisen from diesel or petrol					☑					
2	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		20 mg/kg	1.32	26.407 mg/kg	0.00264 %		
3	beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		1.2 mg/kg	2.775	3.33 mg/kg	0.000333 %		
4	boron { boron tribromide/trichloride/trifluoride (combined) }			10294-33-4, 10294-34-5, 7637-07-2		1 mg/kg	13.43	13.43 mg/kg	0.00134 %		
5	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	<0.2 mg/kg	1.285	<0.257 mg/kg	<0.00002 %		<**LOD**
6	chromium { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		29 mg/kg	1.462	42.385 mg/kg	0.00424 %		
7	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		45 mg/kg	1.126	50.665 mg/kg	0.00507 %		
8	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	38 mg/kg	1.56	59.273 mg/kg	0.0038 %		
9	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.3 mg/kg	1.353	<0.406 mg/kg	<0.0000406 %		<**LOD**
10	nickel { nickel dihydroxide }	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]		28 mg/kg	1.579	44.226 mg/kg	0.00442 %		
11	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<1 mg/kg	1.405	<1.405 mg/kg	<0.000141 %		<**LOD**
12	zinc { zinc sulphate (hydrous) (mono-, hexa- and hepta hydrate); [1] zinc sulphate (anhydrous) [2] }	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]		240 mg/kg	4.398	1055.502 mg/kg	0.106 %		
13	pH			PH		7.7 pH		7.7 pH	7.7 pH		

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
14		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				<1 mg/kg	1.884	<1.884 mg/kg	<0.000188 %		<**LOD**
15		acenaphthene		201-469-6	83-32-9		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<**LOD**
16		acenaphthylene		205-917-1	208-96-8		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<**LOD**
17		anthracene		204-371-1	120-12-7		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<**LOD**
18		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<**LOD**
19		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<**LOD**
20		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<**LOD**
21		benzo[ghi]perylene		205-883-8	191-24-2		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<**LOD**
22		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<**LOD**
23		chrysene	601-048-00-0	205-923-4	218-01-9		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<**LOD**
24		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<**LOD**
25		fluoranthene		205-912-4	206-44-0		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<**LOD**
26		fluorene		201-695-5	86-73-7		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<**LOD**
27		indeno[123-cd]pyrene		205-893-2	193-39-5		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<**LOD**
28		naphthalene	601-052-00-2	202-049-5	91-20-3		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<**LOD**
29		phenanthrene		201-581-5	85-01-8		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<**LOD**
30		pyrene		204-927-3	129-00-0		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<**LOD**
31		phenol	604-001-00-2	203-632-7	108-95-2		<1 mg/kg		<1 mg/kg	<0.0001 %		<**LOD**
									Total:	0.128 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TP187[2]

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:
TP187[2]
Sample Depth:
0.80 m
Moisture content:
6.9%
(no correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 6.9% No Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	confirm TPH has NOT arisen from diesel or petrol					☑					
2	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		15 mg/kg	1.32	19.805 mg/kg	0.00198 %		
3	beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		0.44 mg/kg	2.775	1.221 mg/kg	0.000122 %		
4	boron { boron tribromide/trichloride/trifluoride (combined) }			10294-33-4, 10294-34-5, 7637-07-2		0.4 mg/kg	13.43	5.372 mg/kg	0.000537 %		
5	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	<0.2 mg/kg	1.285	<0.257 mg/kg	<0.00002 %		<**LOD**
6	chromium { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		7.4 mg/kg	1.462	10.816 mg/kg	0.00108 %		
7	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		58 mg/kg	1.126	65.302 mg/kg	0.00653 %		
8	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	27 mg/kg	1.56	42.115 mg/kg	0.0027 %		
9	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.3 mg/kg	1.353	<0.406 mg/kg	<0.0000406 %		<**LOD**
10	nickel { nickel dihydroxide }	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]		16 mg/kg	1.579	25.272 mg/kg	0.00253 %		
11	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<1 mg/kg	1.405	<1.405 mg/kg	<0.000141 %		<**LOD**
12	zinc { zinc sulphate (hydrous) (mono-, hexa- and hepta hydrate); [1] zinc sulphate (anhydrous) [2] }	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]		290 mg/kg	4.398	1275.399 mg/kg	0.128 %		
13	pH			PH		8.6 pH		8.6 pH	8.6 pH		

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
14		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				<1 mg/kg	1.884	<1.884 mg/kg	<0.000188 %		<**LOD**
15		benzene	601-020-00-8	200-753-7	71-43-2		<1 mg/kg		<1 mg/kg	<0.0001 %		<**LOD**
16		ethylbenzene	601-023-00-4	202-849-4	100-41-4		<1 mg/kg		<1 mg/kg	<0.0001 %		<**LOD**
17		toluene	601-021-00-3	203-625-9	108-88-3		<1 mg/kg		<1 mg/kg	<0.0001 %		<**LOD**
18		xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<1 mg/kg		<1 mg/kg	<0.0001 %		<**LOD**
19		acenaphthene		201-469-6	83-32-9		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<**LOD**
20		acenaphthylene		205-917-1	208-96-8		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<**LOD**
21		anthracene		204-371-1	120-12-7		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<**LOD**
22		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<**LOD**
23		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<**LOD**
24		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<**LOD**
25		benzo[ghi]perylene		205-883-8	191-24-2		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<**LOD**
26		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<**LOD**
27		chrysene	601-048-00-0	205-923-4	218-01-9		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<**LOD**
28		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<**LOD**
29		fluoranthene		205-912-4	206-44-0		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<**LOD**
30		fluorene		201-695-5	86-73-7		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<**LOD**
31		indeno[123-cd]pyrene		205-893-2	193-39-5		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<**LOD**
32		naphthalene	601-052-00-2	202-049-5	91-20-3		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<**LOD**
33		phenanthrene		201-581-5	85-01-8		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<**LOD**
34		pyrene		204-927-3	129-00-0		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<**LOD**
35		phenol	604-001-00-2	203-632-7	108-95-2		<1 mg/kg		<1 mg/kg	<0.0001 %		<**LOD**
									Total:	0.144 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TP189

Hazardous Waste
Classified as **17 05 03 ***
in the List of Waste

Sample details

Sample name:
TP189
Sample Depth:
0.20 m
Moisture content:
7.2%
(no correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 03 * (Soil and stones containing hazardous substances)

Hazard properties

HP 14: Ecotoxic "waste which presents or may present immediate or delayed risks for one or more sectors of the environment"

Hazard Statements hit:

Aquatic Chronic 1; H410 "Very toxic to aquatic life with long lasting effects."

Because of determinand:

zinc sulphate (hydrous) (mono-, hexa- and hepta hydrate); [1] zinc sulphate (anhydrous) [2]: (compound conc.: 0.528%)

Determinands

Moisture content: 7.2% No Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	confirm TPH has NOT arisen from diesel or petrol					☑					
2	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		15 mg/kg	1.32	19.805 mg/kg	0.00198 %		
3	beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		1.4 mg/kg	2.775	3.885 mg/kg	0.000389 %		
4	boron { boron tribromide/trichloride/trifluoride (combined) }			10294-33-4, 10294-34-5, 7637-07-2		1.8 mg/kg	13.43	24.174 mg/kg	0.00242 %		
5	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	1 mg/kg	1.285	1.285 mg/kg	0.0001 %		
6	chromium { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		33 mg/kg	1.462	48.231 mg/kg	0.00482 %		
7	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		200 mg/kg	1.126	225.178 mg/kg	0.0225 %		
8	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	99 mg/kg	1.56	154.422 mg/kg	0.0099 %		
9	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.3 mg/kg	1.353	<0.406 mg/kg	<0.0000406 %		**<LOD**
10	nickel { nickel dihydroxide }	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]		36 mg/kg	1.579	56.862 mg/kg	0.00569 %		
11	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<1 mg/kg	1.405	<1.405 mg/kg	<0.000141 %		**<LOD**

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
12		zinc { zinc sulphate (hydrous) (mono-, hexa- and hepta hydrate); [1] zinc sulphate (anhydrous) [2] }				1200	mg/kg	4.398	5277.511	mg/kg	0.528 %		
		030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]									
13		pH				6.8	pH		6.8	pH	6.8 pH		
				PH									
14		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<LOD
		006-007-00-5											
15		acenaphthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
			201-469-6	83-32-9									
16		acenaphthylene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
			205-917-1	208-96-8									
17		anthracene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
			204-371-1	120-12-7									
18		benzo[a]anthracene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
		601-033-00-9	200-280-6	56-55-3									
19		benzo[a]pyrene; benzo[def]chrysene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
		601-032-00-3	200-028-5	50-32-8									
20		benzo[b]fluoranthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
		601-034-00-4	205-911-9	205-99-2									
21		benzo[ghi]perylene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
			205-883-8	191-24-2									
22		benzo[k]fluoranthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
		601-036-00-5	205-916-6	207-08-9									
23		chrysene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
		601-048-00-0	205-923-4	218-01-9									
24		dibenz[a,h]anthracene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
		601-041-00-2	200-181-8	53-70-3									
25		fluoranthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
			205-912-4	206-44-0									
26		fluorene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
			201-695-5	86-73-7									
27		indeno[123-cd]pyrene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
			205-893-2	193-39-5									
28		naphthalene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
		601-052-00-2	202-049-5	91-20-3									
29		phenanthrene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
			201-581-5	85-01-8									
30		pyrene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
			204-927-3	129-00-0									
31		phenol				<1	mg/kg		<1	mg/kg	<0.0001 %		<LOD
		604-001-00-2	203-632-7	108-95-2									
										Total:	0.576 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Hazardous result
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Appendix A: Classifier defined and non GB MCL determinands

confirm TPH has NOT arisen from diesel or petrol

Description/Comments: Chapter 3, section 4b requires a positive confirmation for benzo[a]pyrene to be used as a marker in evaluating Carc. 1B; H350 (HP 7) and Muta. 1B; H340 (HP 11)
Data source: WM3 1st Edition 2015
Data source date: 25 May 2015
Hazard Statements: None.

boron tribromide/trichloride/trifluoride (combined) (CAS Number: 10294-33-4, 10294-34-5, 7637-07-2)

Description/Comments: Combines the hazard statements and the average of the conversion factors for boron tribromide, boron trichloride and boron trifluoride
Data source: N/A
Data source date: 06 Aug 2015
Hazard Statements: EUH014 , Acute Tox. 2; H330 , Acute Tox. 2; H300 , Skin Corr. 1A; H314 , Skin Corr. 1B; H314

chromium(III) oxide (worst case) (EC Number: 215-160-9, CAS Number: 1308-38-9)

Description/Comments: Data from C&L Inventory Database
Data source: https://echa.europa.eu/information-on-chemicals/cl-inventory-database/-/discli/details/33806
Data source date: 17 Jul 2015
Hazard Statements: Acute Tox. 4; H332 , Acute Tox. 4; H302 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Skin Irrit. 2; H315 , Resp. Sens. 1; H334 , Skin Sens. 1; H317 , Repr. 1B; H360FD , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

pH (CAS Number: PH)

Description/Comments: Appendix C4
Data source: WM3 1st Edition 2015
Data source date: 25 May 2015
Hazard Statements: None.

salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex

GB MCL index number: 006-007-00-5
Description/Comments: Conversion factor based on a worst case compound: sodium cyanide
Additional Hazard Statement(s): EUH032 >= 0.2 %
Reason for additional Hazards Statement(s):
20 Nov 2021 - EUH032 >= 0.2 % hazard statement sourced from: WM3, Table C12.2

acenaphthene (EC Number: 201-469-6, CAS Number: 83-32-9)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 17 Jul 2015
Hazard Statements: Eye Irrit. 2; H319 , STOT SE 3; H335 , Skin Irrit. 2; H315 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410 , Aquatic Chronic 2; H411

acenaphthylene (EC Number: 205-917-1, CAS Number: 208-96-8)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 17 Jul 2015
Hazard Statements: Acute Tox. 4; H302 , Acute Tox. 1; H330 , Acute Tox. 1; H310 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Skin Irrit. 2; H315

anthracene (EC Number: 204-371-1, CAS Number: 120-12-7)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 17 Jul 2015
Hazard Statements: Eye Irrit. 2; H319 , STOT SE 3; H335 , Skin Irrit. 2; H315 , Skin Sens. 1; H317 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

benzo[ghi]perylene (EC Number: 205-883-8, CAS Number: 191-24-2)

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 28/02/2015
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 23 Jul 2015
Hazard Statements: Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

fluoranthene (EC Number: 205-912-4, CAS Number: 206-44-0)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 21 Aug 2015
Hazard Statements: Acute Tox. 4; H302 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

- **fluorene** (EC Number: 201-695-5, CAS Number: 86-73-7)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 06 Aug 2015
Hazard Statements: Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

- **indeno[123-cd]pyrene** (EC Number: 205-893-2, CAS Number: 193-39-5)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 06 Aug 2015
Hazard Statements: Carc. 2; H351

- **phenanthrene** (EC Number: 201-581-5, CAS Number: 85-01-8)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 06 Aug 2015
Hazard Statements: Acute Tox. 4; H302 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Carc. 2; H351 , Skin Sens. 1; H317 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410 , Skin Irrit. 2; H315

- **pyrene** (EC Number: 204-927-3, CAS Number: 129-00-0)

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 2014
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 21 Aug 2015
Hazard Statements: Skin Irrit. 2; H315 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

- **ethylbenzene** (EC Number: 202-849-4, CAS Number: 100-41-4)

GB MCL index number: 601-023-00-4
Description/Comments:
Additional Hazard Statement(s): Carc. 2; H351
Reason for additional Hazards Statement(s):
20 Nov 2021 - Carc. 2; H351 hazard statement sourced from: IARC Group 2B (77) 2000

Appendix B: Rationale for selection of metal species

arsenic {arsenic trioxide}

Worst case species based on risk phrases

beryllium {beryllium oxide}

Worst case species based on risk phrases

boron {boron tribromide/trichloride/trifluoride (combined)}

Worst case species based on risk phrases

cadmium {cadmium sulfide}

Worst case species based on risk phrases

chromium {chromium(III) oxide (worst case)}

No chromium VI present from lab analysis.

copper {dicopper oxide; copper (I) oxide}

Most likely common species

lead {lead chromate}

Worst case species based on risk phrases

mercury {mercury dichloride}

Worst case species based on risk phrases

nickel {nickel dihydroxide}

Worst case species based on risk phrases

selenium {selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex}

Worst case species based on risk phrases

zinc {zinc sulphate (hydrous) (mono-, hexa- and hepta hydrate); [1] zinc sulphate (anhydrous) [2]}

No chromium VI present from lab analysis.

cyanides {salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex}

Worst case species

Appendix C: Version

HazWasteOnline Classification Engine: WM3 1st Edition v1.2.GB - Oct 2021
HazWasteOnline Classification Engine Version: 2022.319.5403.10057 (15 Nov 2022)
HazWasteOnline Database: 2022.319.5403.10057 (15 Nov 2022)

This classification utilises the following guidance and legislation:
WM3 v1.2.GB - Waste Classification - 1st Edition v1.2.GB - Oct 2021
CLP Regulation - Regulation 1272/2008/EC of 16 December 2008
1st ATP - Regulation 790/2009/EC of 10 August 2009
2nd ATP - Regulation 286/2011/EC of 10 March 2011
3rd ATP - Regulation 618/2012/EU of 10 July 2012
4th ATP - Regulation 487/2013/EU of 8 May 2013
Correction to 1st ATP - Regulation 758/2013/EU of 7 August 2013
5th ATP - Regulation 944/2013/EU of 2 October 2013
6th ATP - Regulation 605/2014/EU of 5 June 2014
WFD Annex III replacement - Regulation 1357/2014/EU of 18 December 2014
Revised List of Waste 2014 - Decision 2014/955/EU of 18 December 2014
7th ATP - Regulation 2015/1221/EU of 24 July 2015
8th ATP - Regulation (EU) 2016/918 of 19 May 2016
9th ATP - Regulation (EU) 2016/1179 of 19 July 2016
10th ATP - Regulation (EU) 2017/776 of 4 May 2017
HP14 amendment - Regulation (EU) 2017/997 of 8 June 2017
13th ATP - Regulation (EU) 2018/1480 of 4 October 2018
14th ATP - Regulation (EU) 2020/217 of 4 October 2019
15th ATP - Regulation (EU) 2020/1182 of 19 May 2020
The Chemicals (Health and Safety) and Genetically Modified Organisms (Contained Use)(Amendment etc.) (EU Exit) Regulations 2020 - UK: 2020 No. 1567 of 16th December 2020
The Waste and Environmental Permitting etc. (Legislative Functions and Amendment etc.) (EU Exit) Regulations 2020 - UK: 2020 No. 1540 of 16th December 2020
GB MCL List - version 1.1 of 09 June 2021

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