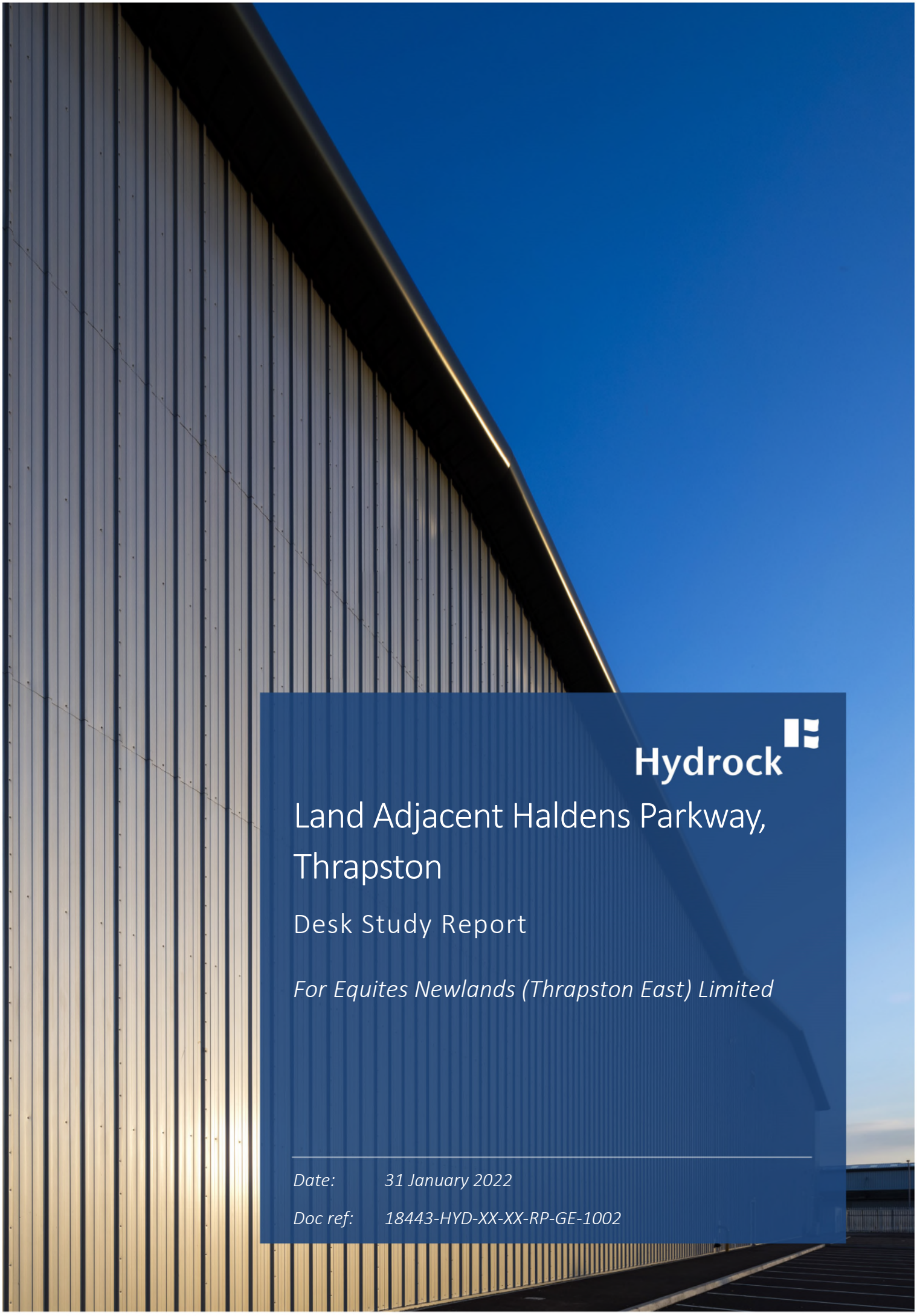

Hydrock

Land Adjacent Haldens Parkway, Thrapston

Desk Study Report

For Equites Newlands (Thrapston East) Limited

Date: *31 January 2022*

Doc ref: *18443-HYD-XX-XX-RP-GE-1002*

DOCUMENT CONTROL SHEET

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P5	S2	31/01/2022	Updated plot area

CONTENTS

Appendices

Tables

Figures

Executive Summary

SITE INFORMATION AND SETTING	
Objectives	The objective of the Phase 1 Desk Study is to formulate a Preliminary Conceptual Ground Model of the site to identify key geo-environmental and geotechnical risks to the proposed development.
Client	Equites Newlands (Thrapston East) Limited.
Site name and location	Land Adjacent Haldens Parkway, Thrapston. The site is located to the north of the A14 and the eastern edges of Thrapston, Northamptonshire at approximate National Grid Reference of 501800E, 278350N
Proposed development	Hydrock understands that the proposed development is to comprise a Hybrid planning application for: • Outline permission sought for storage and distribution (Use Class B8) and ancillary office space. The development incorporates the erection of up to 200,000 sq.m (Gross Internal Area including potential mezzanines) storage and distribution (Use Class B8) space, ancillary parking, highways infrastructure engineering works & landscaping. • Full permission sought for a building measuring 49,704 sq.m to include B8 storage and ancillary office space, parking, servicing & landscaping, Substation / Transformer Compound and foul Pumping Station to meet the needs of a specific occupier (referred to as Plot 1). In addition to the above, the Proposed Development includes: • Demolition of all existing buildings and structures to enable the development of the site. • Earthworks to create a development plateau across the site, and to form landscaped bunding, focused around the northern, eastern, western edges of the site. • Provision for new drainage features as part of a site-wide sustainable drainage strategy. • Provision of on-site landscaping and new habitat creation, including on the bunding, to deliver new and retained existing green infrastructure which supports biodiversity, and to help filter views of the site from the surrounding area. • Highways improvements to deliver the site access from Huntingdon Road, including upgrade works at the A14 junction 13, and the junction with the A605 to the west of the site and traffic calming measures along Islington. • Diversion of the existing access track to the retained farm buildings to the south of the site adjacent to the A14. Based on provided cut to fill models it is anticipated a large cut to fill operation to create a development platform will be undertaken across the site with up to 11m of cut in the southwest and up to 8m of fill in the north to create a development platform at 53.72m OD. Surrounding landscape bunds of up to 10.50m above the development platform in the north and 7.50m above the development platform in the east are proposed at slope angles of a maximum 1/3 gradient with cut slopes at 1/3.5 gradient in the south and west.
GROUND MODEL	
Desk study summary	The site has a total area of 74.83 ha (184.90 acres), and generally comprises open agricultural land bounded by hedgerows and sporadic trees with Castle Manor farm present in the central east of the site and grassed covered field in the south-west quarter of the site and adjacent to the farm yard. The site is roughly rectangular in shape, measuring approximately, 1.0km west to east and 615m north to south with an irregular shaped area present in the north-west, extending from the approximate centre of the northern boundary to the north-west corner. The site generally slopes down from the south-west corner (68m OD) towards the north-east and from the north-west (65mOD) towards the east reaching a low point of 44mOD in the north of the site. The site also slopes from the south-east (53.5mOD) towards the north and from the north-east corner (50m OD) towards the west, to this lowest point in the north-east central area (44mOD) in the

north. This forms a valley feature splitting into two arms (although still sloping at a slightly reduced gradient) one in the north-east with an arm extending towards the south-west and south.

A pond is present in the central east, adjacent to Castle Manor Farm.

Surface water ditches are present in the centre of the site flowing to the central north. Another surface water ditch is present on the northern boundary. All surface water drainage then flows to the northeast to join Thorpe Brook and ultimately joins the River Nene 3km to the north at approximately 20m lower than the lowest point on site.

The site is bounded by Huntingdon Road to the west, agricultural fields to the north and west, and by a residential property & barn buildings to the south beyond which is the A14 & Islington Lane to the west.

Review of historical Ordnance Survey mapping indicates:

- The site was open farmland in the earliest available maps (1885) with Castle Manor Farm shown to the central east of the site with a pond to the east of the farm.
- 'Old Stone Pits' and earthworks are shown in the south-east corner of the site century with Castle Manor Farm and a pond in the central eastern boundary from 1885. The 'Old Stone Pits' and earthworks in this area are no longer shown by 1982 with field boundaries changed to reflect current boundaries.
- Rectory Farm Quarry and Landfill, operated by Mick George was permitted in 2004 in the south-west of the site and operated from 2000 to 2015, initially for extracting sand and gravel and then the deposition if 'inert' waste in the gravel pit void. The landfill comprised a total of 8 cells, with settlement lagoons present in the central north of the site. It is anticipated the landfill is approximately 10.0m based on the underlying geology.
- The landfill was restored by 2016. It is understood the landfill is closed, although the licence is yet to be surrendered.

A detailed specialist Unexploded Ordnance Survey assessment indicates a low bomb risk.

The geology at the site, as indicated by the British Geological Survey (BGS) comprises:

- Oadby Member (locally in the southwest of the site) comprising clay with occasional sand and gravel pockets; over
- Glaciofluvial Deposits (locally in the southwest of the site) comprising sand and gravel; over
- Oxford Clay Formation (in the southwest of the site comprising weathered clays and mudstones; over
- Kellaways Sand Member (outcropping in the west of the site) comprising sand and siltstone; over
- Kellaways Clay Member (outcropping in the south, centre and northwest) comprising grey mudstone; over
- Cornbrash Formation (outcropping in the centre and east) comprising blueish grey weathering olive or yellowish-brown limestone; over
- Blisworth Clay Formation (outcropping in the north and centre of the site) comprising grey mudstone; over
- Blisworth Limestone Formation (Outcropping in the north of the site) comprising pale grey or off-white yellowish limestone.

Localised Made Ground is expected to be present in the landfill in the south-west, in the area of the infilled 'Old Stone Pits' in the south-east, and around Castle Manor Farm.

The superficial deposits comprise a Secondary A aquifer (Glaciofluvial) and Secondary undifferentiated (Oadby Member).

The underlying geology comprises secondary A Aquifers (Kellaways Sand Member, and Cornbrash Formation) and Principal Aquifer (Blisworth Limestone Formation. The remainder of the geological units are unproductive (Oxford Clay Formation, Kellaways Clay Member and Blisworth Limestone Formation).

The site is not within a Source Protection Zone and there are no groundwater abstractions within 1km of the site.

A detailed specialist UXO assessment indicates a low UXO risk.

ASSESSMENT AND CONCLUSIONS	
Preliminary Geotechnical Hazards	The following plausible geotechnical risks are identified. • Uncontrolled Made Ground (variable strength and compressibility), with the landfill in the south-west, the infilled 'Old Stone Pits' in the south-east, and around Castle Manor Farm - settlement or differential settlement of foundations, floor slabs, roads and infrastructure elements. • Soft / loose compressible ground (low strength and high settlement potential), potentially associated with the drainage ditches in the central north of the site. • Low strength, compressible ground, associated with the Superficial Deposits and the upper profile of the Kellaways Formation and Blisworth Formation (near surface softening) – risk of shear failure and excessive settlement of foundations, roads and infrastructure elements. • Shrinkage/swelling of clay – settlement/heave of foundations, especially when located within the influence of trees and vegetation. • Variable lateral and vertical changes in ground conditions, due to the presence of highly variable ground conditions (Made ground, sand and gravel, soft clay, stiff clay and rock) – potential for differential settlement. • Attack of buried concrete by aggressive ground conditions – the development site may contain Made Ground and potentially sulfate bearing soils. • Potential for obstructions and the risk of instability of excavations, associated with landfill, localised areas of historical construction and rock strata, with the impact on construction staff, vehicles and plant operators. • Shallow groundwater, perched within the landfill, the glaciofluvial sand and gravel deposits and within limestone horizons and the potential impact on permanent construction and temporary works. • Changing groundwater conditions, both seasonally (as the groundwater flux changes), and vertically (as the ground conditions vary across the site) and the potential impact on permanent construction and temporary works. • Potential for sub-artesian water within the Kellaways Formation and Cornbrash Formation (and associated pore water pressure increases in the Oxford Clay Formation). • Risk from erosion or flooding, associated with the drainage ditches across the central and northern parts of the site. • Running sands and loose soils associated with the River Terrace Deposits and shallow groundwater, leading to difficulty with excavation due to trench instability. • Potential for slope stability issues, including general slopes, man-made slopes and retaining walls / features. • Land raised areas – self-weight settlement, long term creep settlement and inundation settlement. • Earthworks – low bearing capacity or settlement of new fill and impact on foundations, floor slabs, roads and infrastructure and construction plant. • Earthworks – unsuitability of site won material to be reused as fill. • Potential for possible cambered ground, gulls and relict slip surfaces and associated slope instability. • Potential for unforeseen ground conditions and the risks associated with limited data. • Uncontrolled Made Ground (variable strength and compressibility), associated with the landfill in the south-west, the infilled 'Old Stone Pits' in the south-east, and around Castle Manor Farm. • Problematic soils.
Preliminary Geo-environmental Conclusions	Based on historical land uses and its current operational use, the overall risk from land contamination at the site is considered to be low for the current development, and low (with some specific moderate to high risks) identified for a redeveloped site, but would need to be confirmed by appropriate intrusive investigation, testing and assessment of the results of the investigation.

Preliminary Geo-environmental Conclusions

It is considered that it is unlikely that the site would be classified as Contaminated Land under Part 2A of the EPA 1990.

The possible pollutant linkages on an unremediated site determined by desk study and walk-over are summarised below for risk levels of moderate or greater.

Source(s)	◄ potential Impact on ►	Receptor(s)
Metals, metalloids, PAH, TPH and asbestos in Made Ground associated with the 'inert' landfill in the south-west.		Site users. Surface Water. Groundwater. Surface Water Pipes
Metals, metalloids, PAH, TPH and asbestos in Made Ground associated with the 'Old Stone Pits' in the south-east.		
Metals, metalloids, PAH, TPH and asbestos in Made Ground associated with the Castle Manor Farm and access road.		
Petroleum hydrocarbons and VOC from AST in Castle Manor Farm.		
Ground gases (carbon dioxide and methane) from organic materials in the Landfill, Made Ground around Castle Manor Farm and the 'Old Stone Pits'.		Site Users, Neighbours Buildings
Asbestos fibres from insulation or Asbestos Containing Materials in the buildings and around the farm.		On Site Neighbours

FUTURE CONSIDERATIONS

Further work

In order to confirm the actual risks to receptors and confirm the ground conditions with respect to potential geotechnical and geo-environmental risks, further desk study works and an appropriate intrusive investigation will need to be undertaken.

With regard to further desk study works, Hydrock understand that boreholes have been installed in the landfill as part of the landfill closure reporting (BH1 – BH14). Borehole logs have not been provided. It is recommended that copies of the previous boreholes are obtained and the data added to future iterations of this report.

The preliminary investigation will need to:

- determine the depth and distribution of Landfill, Made Ground and natural strata across the site;
- determine the soil strength/density profile beneath the site;
- determine the depth/level of groundwater beneath the site;
- determine the ground gas concentrations beneath the site;
- determine CBRs to assist with pavement design;
- assess trench stability, over break potential and 'diggability';
- allow sampling for chemical and geotechnical laboratory testing;
- allow soil classification to allow geotechnical characterisation and determine suitability for reuse of soils within earthworks;
- obtain information in terms of Aggressive Chemical Environment for Concrete Class (ACEC Class).

Following investigation, assessment will be required to:

- update the Ground Model;
- update the Geotechnical Risk Register;
- provide Geotechnical Design recommendations;
- update the Conceptual Site Model (CSM), including identification of plausible pollution linkages;
- undertake generic quantitative risk assessment of potential chemical contaminants to establish 'suitability for use' under the current planning regime;
- discuss potential environmental liabilities associated with land contamination (soil, water and gas); and
- provide outline mitigation recommendations to ensure the site is 'suitable for use'.

	Following the preliminary investigation detailed site investigation will be required at a later date. Following detailed investigation, design of the remediation and earthworks will be required. This will require detailed discussions and agreement with regulators, including the Environment Agency regard waste and materials management, During earthworks and remediation, site audits and verification will be required.

This Executive Summary forms part of Hydrock Consultants Limited report number 18443-HYD-XX-XX-RP-GE-1002 and should not be used as a separate document.

1. INTRODUCTION

1.1 Terms of reference

In February 2021, Hydrock Consultants Limited (Hydrock) was commissioned by Equites Newlands (Thrapston East) Limited (the Client) to undertake site investigation, comprising a Phase 1 desk study and Phase 2 intrusive ground investigation at Land Adjacent Haldens Parkway, Thrapston. This report is the Phase 1 Desk Study. The Phase 2 Ground Investigation report is presented separately.

The site is located to the north of the A14 on the eastern edges of Thrapston, Northamptonshire, with the National Grid Reference of the approximate centre of the site is 501800E, 278350N.

The site is approximately 74.83 ha (184.90 acres) in area and currently comprises open agricultural land with hedge and tree lined fields, with Castle Manor Farm and associated buildings and hardstanding, present in the central east of the site. An historical sand gravel quarry and closed landfill are present in the south-west of the site.

The works have been undertaken in accordance with Hydrock's proposal referenced (18443-HYD-XX-ZZ-FP-GE-001-P3 dated 23rd February 2021) and the Client's instructions to proceed (Ref email from Peter Goddard to Allan Bell dated 30th April 2021).

1.2 Proposed Development

Hydrock understands that the proposed development is to comprise a Hybrid planning application:

- Outline permission sought for storage and distribution (Use Class B8) and ancillary office space. The development incorporates the erection of up to 200,000 sq.m (Gross Internal Area including potential mezzanines) storage and distribution (Use Class B8) space, ancillary parking, highways infrastructure, engineering works & landscaping.
- Full permission sought for a building measuring 49,704 sq.m to include B8 storage and ancillary office space, parking, servicing & landscaping, substation/transformer compound and foul pumping station compound, to meet the needs of a specific occupier (referred to as Plot 1).

In addition to the above, the Proposed Development includes:

- Demolition of all existing buildings and structures to enable the development of the site.
- Earthworks to create a development plateau across the site, and to form landscaped bunding, focused around the northern, eastern, western edges of the site.
- Provision for new drainage features as part of a site-wide sustainable drainage strategy.
- Provision of on-site landscaping and new habitat creation, including on the bunding, to deliver new and retained existing green infrastructure which supports biodiversity, and to help filter views of the site from the surrounding area.
- Highways improvements to deliver the site access from Huntingdon Road, including upgrade works at the A14 junction 13, and the junction with the A605 to the west of the site and traffic calming measures along Islington.
- Diversion of the existing access track to the retained farm buildings to the south of the site adjacent to the A14.

An Indicative Masterplan (pHp Architects Drawing HRT-pHp-01-XX-DR-A-4432-012-P18), is presented in Appendix A and indicates approximately 186,177 sq.m (2,004,000 sq. ft.) of warehouses floor space, with a total of 197,790 sq.m (2,129,000 sq. ft.) of development.

Based on provided cut to fill models it is anticipated a large cut to fill operation to create a development platform will be undertaken across the site with up to 11m of cut in the southwest and up to 8m of fill in the north to create a development platform at 53.72m OD. Surrounding landscape bunds of up to 10.50m above the development platform in the north and 7.50m above the development platform in the east are proposed at slope angles of a maximum 1:3 gradient with cut slopes at 1:3.5 gradient in the south and west.

1.3 Objectives

The works have been commissioned to support the planning application for the proposed development and to assist with its design.

The site investigation includes a Phase 1 Desk Study and a Phase 2 Ground Investigation. This report presents the findings of the Phase 1 Desk Study. The objectives of the Phase 1 Desk Study are to formulate a preliminary Ground Model and an Initial Conceptual Site Model of the site to identify and make a preliminary assessment of key geo-environmental and geotechnical risks to the proposed development.

1.4 Scope

The scope of the Phase 1 Desk Study comprises:

- a field reconnaissance (walkover) to determine the nature of the site and its surroundings including current and former land uses, topography and hydrology;
- acquisition and review of:
  - historical Ordnance Survey maps, to identify former potentially contaminative uses shown at the site and immediately surrounding it, and an assessment of the associated contamination risks;
  - a third-party environmental report to identify flooding warning areas, local landfills, pollution incidents, abstractions, environmental permits etc. which may have had the potential to have environmental impact on the site;
  - topographical, geological and hydrogeological maps;
  - British Geological Survey (BGS) archive records;
  - a site-specific specialist UXO Desk Top Study
- development of a preliminary Ground Model representing ground conditions at the site;
- development of an initial Conceptual Site Model (iCSM), including identification of potential pollution linkages;
- a qualitative assessment of any geo-environmental risks identified; and
- identification of plausible geotechnical hazards.

This report relates to the “on-site” works only. Separate reports will be required for “off-site” highways and infrastructure works.

1.5 Available information

The following drawings have been prepared on behalf of the Client for the site:

- pHp Architects. April 2021. 'Huntingdon Road, Thrapston. Indicative Masterplan and Plot 1 Details'. Ref: HRT-pHp-01-XX-DR-A-4432-012-P18.
- pHp Architects. April 2021. 'Huntingdon Road, Thrapston. Location Plan'. Ref: HRT-pHp-01-XX-DR-A-4432-016-P08.
- pHp Architects. April 2021. 'Huntingdon Road, Thrapston. Parameters Plan'. Ref: HRT-pHp-01-XX-DR-A-4432-014-P22.
- StafSurv. June 2021. Huntingdon Road, Thrapston. Proposed Pateau & Mound – Levels & Layout', Ref: 11686a-0.
- StafSurv. June 2021. Huntingdon Road, Thrapston. Cut and Fill Contours, Plateau Only (No Mounds)', Ref: 11686b-0.

The following reports and drawings have been provided to Hydrock by the Client for use in the preparation of this report:

- Newlands Developments. December 2020. 'Huntingdon Road Thrapston, Topographical Survey', Ref 11396a-0.
- Oxford Archaeology. July 2021. Land East of Thrapston, Northamptonshire, Geophysical Survey Report, Ref MSTL977.

Hydrock understands that the Client has commissioned or obtained assignment of the above documents and has placed full reliance upon their contents.

The following documents have been requested from and provided by the Environment Agency under a freedom of information request, relating to the landfill in the south-west:

- 17th October 2006. Variation of PPC Landfill Permit under the Pollution Prevention and Control (England and Wales) Regulation 2000 (SI 2000 No.1973) and the Landfill (England and Wales) Regulations 2002 (SI 2002 No.1599). Permit Number BT9879IY (EP3837LU).
- 17th October 2006. Variation Notice with introductory note. Variation Notice Number EP3837LU, Permit Number BT9879IY.
- 11th January 2008. Variation notice with introductory note. Variation Notice Number PP3233XK, Permit Number EP3837LU.
- 5th July 2015. Permit with introductory note. Application Permit Number BT9879.
- Tetratech. February 2021. 'Rectory Farm, Thrapston Landfill – Closure Report.' Ref B026487.
- Gas and groundwater monitoring data recorded between May 2009 to March 2021.
- A Borehole Plan and Borehole logs ref GW1, GW2 and GW3.
- Topographic Survey Drawings from 2015, 2016, 2017 and 2020.

Hydrock acknowledges that the documents provided by the Environment Agency are not assigned to the Client, and have been used for information purposes only. No formal reliance has been placed upon their contents.

The following documents have been requested from and provided by the landfill licence holder (Mick George Ltd) relating to the landfill in the south-west:

- Mick George. 2nd October 2009. 'Thrapston Quarry, Cell Location Plan. Ref MG310/7
- White Young Green. 13th August 2018. 'Thornhaugh Landfill Site, Construction Quality Assurance Plan for the Drilling of In Waste Gas Monitoring Boreholes. Ref A109017 QP01.
- Appendix B Photos – Unreferenced
- Remaining Void March 2015 photograph – Unreferenced.

Hydrock acknowledges that the documents provided by Mick George are not assigned to the Client, and have been used for information purposes only. No formal reliance has been placed upon their contents.

1.6 Regulatory context and guidance

The geo-environmental section of this report is written in broad accordance with BS 10175:2011+ A2:2017, 'Land Contamination: Risk Management' (LCRM, 2021) and the AGS (2006) 'Good Practice Guidelines for Site Investigations'. The methods used follow a risk-based approach, the first stage of which is a Phase 1 desk study and field reconnaissance, with the potential geo-environmental risk assessed qualitatively using the 'source-pathway-receptor contaminant linkage' concept to assess risk as introduced in the Environmental Protection Act 1990 (EPA, 1990).

The geotechnical section of this report is prepared in general accordance with BS EN 1997-1+A1: 2013, BS EN 1997-2:2007 and BS 8004:2015. This report forms the Preliminary Sources Study Report (PSSR) as defined by CD6221.

Remaining uncertainties and recommendations for further work are listed in Section 4 and Section 5.

2. DESK STUDY

2.1 Data

A number of desk study sources have been used to assemble the following information. These are presented in Appendix D and include:

- Third-party environmental report (Groundsure report, reference GS-7926027).
- Historical Ordnance Survey mapping.
- BGS Archive Records.
- Zetica UXB Risk Maps (https://zeticauxo.com/downloads-and-resources/risk-maps/).
- Specialist UXO Desk Top Study, EOD Contracts (Reference: EOD/21/21249/DTS).
- Information provided by the Environment Agency.
- Information provided by Mick George Ltd (the Landfill licence holder).

The application site was expanded during the course of the design development, as such the original Groundsure report site boundary is slightly smaller in area (excluding the north east spur), although the area is covered as part of the wider site information area.

2.2 Site referencing

The site is referenced in Table 2.1 and the location is indicated in Appendix A.

Table 2.1: Site referencing information

Item	Brief Description
Site name	Land Adjacent Haldens Parkway, Thrapston.
Site address	Land off Huntingdon Road, Thrapston, Northamptonshire (nearest postcode is NN14 4QT).
Site location and grid reference	The site is located to the north of the A14 on the eastern edges of Thrapston, Northamptonshire. The National Grid Reference of the approximate centre of the site is 501800E, 278350N

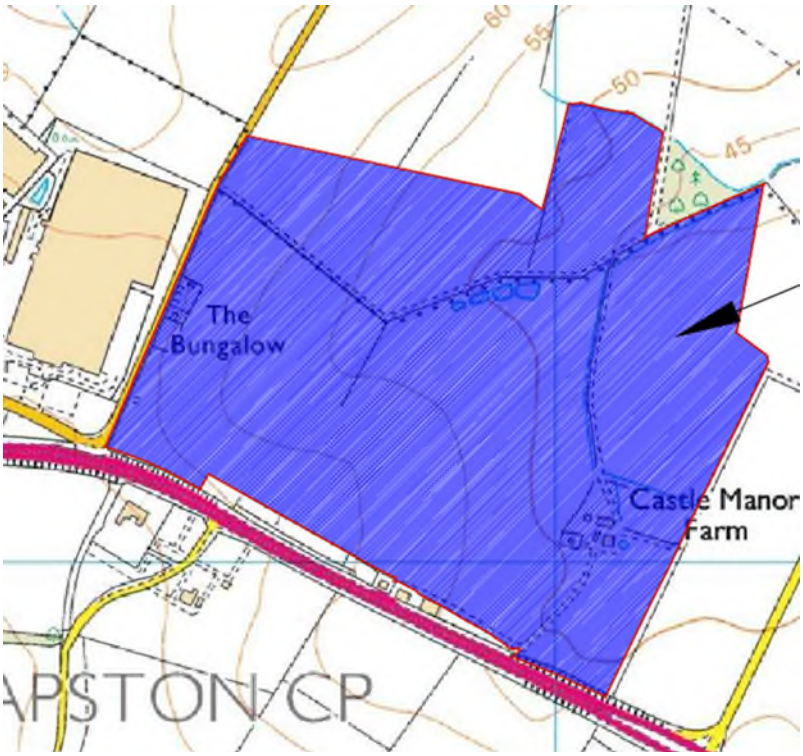

Figure 2.1: Site location and extract from the Ordnance Survey Map (OS licence 100223353)

A site location plan (Hydrock Drawing 18443-HYD-XX-ZZ-DR-GE-1001) is presented in Appendix A.

2.3 Site description and field reconnaissance survey

A field reconnaissance survey was undertaken on 2nd June 2021 to visually assess potential geotechnical hazards, potential contaminant sources and existing potential receptors, and is presented on a Site Features Plan reference 18443-HYD-XX-ZZ-DR-GE-1003. The weather during the field reconnaissance survey was clear.

A description of the site is presented in Table 2.2 and selected photographs are presented in Figure 2.3 to Figure 2.8. Additional photographs are presented in Appendix B.

Table 2.2: Site description

Item	Brief Description
Site access	Via a gated access from the west off Huntingdon Road to access Field 1 and Field 2. Access to Castle Manor Farm is along a concreted track off Polopit Road, following the eastern boundary of the site. A gravel track provides access to the fields from Castle Manor Farm to the north and also to the south extending from the farm yard complex. The gravel track heading south from Castle Manor Farm, is through the adjacent farm and then immediately onto the A14. The gravel track heading north from Castle Manor Farm, turns west in the north of the site and extends to the gated access off Huntingdon Road to access Field 2.
Site area	The site is roughly rectangular in shape, measuring approximately, 1.0km west to east and 615m north to south with a total site area of approximately 74.83 ha (184.90 acres). An irregular shaped area is present in the north-west, extending from the approximate centre of the northern boundary to the north-west corner.

Item	Brief Description
Elevation, topography and any geomorphic features	The site generally slopes down from the south-west corner (68m OD) towards the north-east and from the north-west (65mOD) towards the east reaching a low point of 44mOD in the north of the site. The site also slopes from the south-east (53.5mOD) towards the north and from the north-east corner (50m OD) towards the west, to this lowest point in the north-east central area (44mOD) in the north. This forms a valley feature splitting into two arms (although still sloping at a slightly reduced gradient) one in the north-east with an arm extending towards the south-west and south.
Present land use	For the purposes of this description the present land use has been subdivided into 6 areas as shown on Figure 2.2 with land use indicate below at the time of the site reconnaissance: • Field 1 – Overgrown/disused field in the south-west (area of a former sand and gravel quarry and closed landfill). • Field 2 – Cropped field in the north-east. • Field 3 – Cropped field in the north. • Field 4 – Cropped field in the north-west • Field 5 – Cropped field in the south and centre. • Area 6 – Castle Manor Farm and surrounding area in the central east. Overhead high voltage cables on wooden poles cross the south-west corner of Field 1 in a north-west to south-east orientation before following the western / southern boundary of Field 5, just inside the confines of the site. There are drainage ditches/streams in the north and central east of the site and a pond in Castle Manor Farm in part before leaving site in the north flowing towards the north-east. Arable Fields The majority of the site comprises arable land subdivided into 4 fields (Fields 2 to 5). Former sand and gravel pit and inert landfill An additional field in the south-west of the site (Field 1), is overgrown and associated with a former sand and gravel pit and subsequent inert landfill (closed). This area was noted to have an uneven surface with occasional concrete cobbles and boulders at the surface, with above ground borehole covers noted within this field. Castle Manor Farm Castle Manor Farm (Area 6), encompasses an area of approximately 660m^2 and comprises, a residential property (Oak Cottage) in the west, two farm buildings and concrete laydown yard in the centre, an additional brick building, a small pond and two three areas of soft landscaping. There is a bunded above-ground fuel tank adjacent to the northern barn. No evidence of spillage into the surrounding soils is observed. Around the farm the soft landscaping is grassed with two area of overgrown land in the east. There is a former chicken shed with suspected asbestos sheet roofing in the northern overgrown area of the farmyard.
Vegetation	The majority of the fields are boarded by hedgerows and sporadic trees. Areas of denser mature trees are present around the pond in around Castle Manor Farm, to the north of Castle Manor Farm, adjacent to the A14 along the southern border and a copse off-site to the north-east.
General site sensitivity	The site is within a generally rural area adjacent to, and to the east of, an area of commercial development and to the north of the A14.

Item	Brief Description
Site boundaries and surrounding land	The northern boundary runs through agricultural land with no demarcated boundary with further agricultural land beyond it. The eastern boundary comprises a copse of trees in the north-east, agricultural land (with no demarcated boundary) and hedgerows and sporadic trees with agricultural land beyond. The southern boundary passes around farm buildings and a residential property. The A14 runs to the south of the southern site boundary. The eastern site boundary is bounded by hedgerows and a building/storage area in the centre with Huntingdon Road beyond.

A site survey plan (Hydrock Drawing 18443-HYD-XX-ZZ-DR-GE-1002) and a site features plan (Hydrock Drawing 18443-HYD-XX-ZZ-DR-GE-1003) are presented in Appendix A.

Figure 2.2: Site Features

Refer to Hydrock Drawing 18443-HYD-XX-XX-DR-GE-1003 In Appendix A for a scale copy.

Figure 2.3 :Castle Manor Farm complex (AST in background)

Figure 2.4: Overgrown fields around Castle Manor Farm.

Figure 2.5: Former chicken shed with suspected asbestos cement sheeting on roof

Figure 2.6: General overview (sloping up towards the south-west) (Field 5)

Figure 2.7: Looking towards the south from most northern point of site (Field 3 overlooking Fields 4 & 5)

Figure 2.8: Overview of field in the south-west (Field 1)

2.4 Site history

A study of historical Ordnance Survey maps Appendix C has been undertaken to identify former land uses at the site and surrounding areas which may have geotechnical or geo-environmental implications for the proposed development. The key findings are summarised in Table 2.3.

Table 2.3: Site history review

Reference	Key features on site	Key features off-site
OS Map[1] 1885: 1:10,560 1886: 1:2,500	The site is shown to be several fields with Castle Manor Farm (labelled as Rectory Farm) shown to the central west of the site and a pond to the west of the farm buildings. Trackways lead to the north and south of the farm area. In the south-west corner of the site, earthworks are shown, which extend slightly offsite to the south, labelled as 'Old Stone Pits'.	The surrounding sites are mostly open fields. Elm Tree Lodge borders part of the eastern boundary with roadways bordering the eastern and just beyond the southern boundary Gales Lodge is shown approximately 100m to the south-east The village of Titchmarsh is shown approximately 550m to the north-east. A groundwater flow arrow is shown 50m to the north-east flowing south-west to north-east with a spring shown along this line approximately 500m to the north-east indicating it forms a stream. A second stream is shown approximately 250m to the east at its closet point flowing to the north.
OS Map 1901: 1:10,560 OS Map 1900: 1:2,500	No significant change.	No significant change.
OS Map 1951: 1:10,560	No significant change.	A small structure is shown bordering the south of the site. A sewage works is shown approximately 200m to the south. Buildings and associated roads are shown approximately 50m to the south in the west of the site indicated to be a potential army depot within the 2.15 Unexploded ordnance (UXO) report (See Section 2.15)
OS Map 1974: 1:2,500	No significant change.	The buildings 50m to the south are shown as an 'Agricultural Machinery depot' 'The Bungalow' is shown adjacent to the west of the site. Road to the south is labelled as the A604. 'Issues' (i.e. springs) are shown approximately 60m to the north of the site.
OS Map 1982: 1:10,560	The 'Old Stone Pits' and previous earthworks markings within the site boundaries are no longer shown. A number of fields boundaries are no longer shown with the site now comprising five larger, irregular shaped fields.	The buildings 50m to the south are shown as a Depot. The sewage works are no longer shown. Gales Lodge is renamed as Bottom Lodge. A covered reservoir is shown 120m to the south-east.
OS Map 1994: 1:10,560	Oak Cottage is shown within the Castle Manor Farm complex.	The road to the south and east of the site appears to have been improved – corresponding with the opening of the A14

[1] Ordnance Survey Historical Map Information provided by Groundsure.

Reference	Key features on site	Key features off-site
OS Map 1991 – 1993 1:2,500	A drain is shown to the north of Castle Manor Farm trending east to west and then south to north.	link road (to the south) which opened in July 1994. A few further buildings are shown adjacent to the south of the site. Earthworks off site (as part of the 'Old Stone Pits') are no longer shown.
1999 Aerial Photography	No significant change (Figure 2.9).	
OS Map 2001: 1:10,000	No significant change.	A number of depots are shown 400m to the west.
Google Earth© Imagery 2004[2]	Significant works (sand and gravel quarry) are apparent in the south-west of the site within Field 6, comprising stockpiles in the south-west and west and open excavations in the north and centre. The north-east and south-east of this area remains undisturbed. A second area in the centre of the site shows four ponds and stockpiles adjacent. These works appear to be associated with a quarrying operation.	A distribution centre is shown to the west of the site.
Google Earth© Imagery 2008[3]	The quarrying works have extended towards the south-east although remaining within Field 6, with excavations in the north of the field appearing to have been backfilled (Figure 2.10).	No significant change.
OS Map 2010: 1:10,000 Google Earth© Imagery 2010[4]	Four roughly rectangular ponds are shown in the northern centre of the site, increasing in size from west to east and corresponding to locations observed from Google Earth© Imagery The excavation works in Field 6 have been part infilled in the north of this field (Figure 2.11). Works are still shown in the south and southeast of the field and part within the centre field in the southwest corner.	A distribution centre is shown opposite the roadway bordering the east of the site corresponding with previous Google Earth© Imagery. Residential properties are shown up to 1km to the west (Thrapston).
Google Earth© Imagery 2004[5]	The works in the south-west field and ponds in the centre north are no longer shown and appear infilled (Figure 2.12).	No significant change.
OS Map 2021: 1:10,000	The four ponds in the north of the site are no longer shown.	No significant change.

[2] ©Infoterra Ltd & Bluesky image date: 1/1/2004.
[3] © 2021 Getmapping plc, Infoterra Ltd & Bluesky, image date: 10/17/2008.
[4] © 2021 Getmapping plc, image date: 01/01/2010.
[5] © 2021 Getmapping plc, image date: 04/08/2017.

Figure 2.9: 1999 Aerial Photography (Reproduced with permission from Groundsure)

Figure 2.10: 2006 Aerial Photography (Reproduced with permission from Groundsure)

Figure 2.11: 2011 Aerial Photography (Reproduced with permission from Groundsure)

Figure 2.12: 2016 Aerial Photography (Reproduced with permission from Groundsure)

2.5 Geology

The general geology of the site area is shown on the British Geological Survey (BGS) 1:50,000 geological map of Kettering (Sheet 171) and the 1:10,000 British Geological Survey (BGS) map extract reproduced as part of the Groundsure report and is summarised in Table 2.4. Extracts from the map are shown in Figure 2.13 and Figure 2.14[6].

[6] It should be noted that the site boundary indicated in Figure 2.13 and 2.14 has been modified since the original data appraisal has been undertaken. This report encompasses the entire main site area (excluding off site existing roads) as submitted for planning.

Table 2.4: Geology

Ref. for Figures	Location	Stratigraphic Name	Description
Superficial Deposits (Figure 2.13 (Reproduced with permission from Groundsure))			
1	On site	Glacial Till – Oadby Member	Grey weathering brown clay with subordinate lenses of sand and gravel with chalk and flint fragments.
2	On site	Glaciofluvial Deposits	Sands and gravels.
Solid Geology (Figure 2.14 (Reproduced with permission from Groundsure))			
5	On site outcropping in the south-west of the site, overlying the Kellaways Sand Member	Oxford Clay Formation	Silicate -mudstone, grey with sporadic beds of limestone.
4	On site outcropping in the west of the site, overlying the Kellaways Clay Member	Kellaways Sand Member	Silicate sandstone and siltstone, pale grey with interbeds of sandy and silty mudstone (typically 3, to 5m within the East Midlands).
9	On-site, outcropping in the south, centre and north-west, overlying the Cornbrash Limestone Formation.	Kellaways Clay Member	Grey mudstone (typically 2 to 3m within the East Midlands).
8	On site, outcropping in the centre and east, overlying the Blisworth Cornbrash Formation	Cornbrash Limestone Formation	Medium to fine grained, blueish grey, weathering olive or yellowish-brown limestone (up to 10.50m thick but generally 2-4m).
6	On site outcropping in the centre and north, overlying the Blisworth Limestone Formation	Blisworth Clay Formation	Silicate mudstone, grey with frequent fossils, rootlets and ironstone nodules typically, 2-4m thick).
1	On site – outcropping in the north.	Blisworth Limestone Formation	Pale grey or off-white yellowish limestone (typically, 6-7m thick).
-	Underlying Blisworth Limestone Formation at depth	Rutland Formation	Grey mudstone and siltstone (typically, 8-12 m thick).
-	Underlying Stamford Member at depth	Stamford Member	Greenish grey to yellowish and white sandstone or siltstone. (typically 4-5m thick)

A fault line is shown in the far north of the site, trending east to west with downthrow to the north (see Figure 2.14).

Figure 2.13: Superficial deposits.

Figure 2.14: Solid geology

Based on the historical mapping and known stone workings in the south-east and sand and gravel extraction (and subsequent landfilling) in the south-west, deep Made Ground is anticipated in these areas.

A number of borehole logs from the BGS archive have been reviewed. Selected records are summarised below:

- TL07NW37, located along the south-west edge of the site (NGR 501255.6E, 278201N, drilled to a depth of 13.20m and recorded:
  - Topsoil to 0.30m bgl;
  - Glacial Till to 8.60m bgl;
  - Fluvio-Glacial Sand and Gravel to 12.80m bgl;
  - Oxford Clay to 13.20m bgl comprising a stiff greyish brown gravelly sandy clay over reddish brown limestone.

Whilst generally indicative of Glacial Till overlying superficial deposits, the presence of limestone at the base of the borehole indicates soils are likely to represent top of the Cornbrash Formation rather that the Oxford Clay Formation.

Borehole data (drilled post landfilling), related to waste management licencing and provided by the Environment Agency indicate:

- GW1 located in the south-west of the site:
  - Subsoil to 0.60m bgl; over
  - Glacial Till to 6.20m bgl; over
  - Glaciofluvial Sand and Gravel to 10.10m bgl; over
  - 'Grey Rock' (possibly the Cornbrash Formation).
- GW2 Located in the centre west of the site (north of the landfill):
  - No records to 7.30m (assumed to be landfill); over
  - Grey Limestone (possibly the Cornbrash Formation) to a depth of 8.90m bgl; over

  - » Blisworth Clay to 11.70m bgl; over
  - » Blisworth Limestone to 18.60m bgl; over
  - » the Stamford Member to 24.0m bgl.
- GW3 located in the centre of the site:
  - » Topsoil to 0.30m bgl; over
  - » Kellaways Clay to 1.30m bgl; over
  - » Cornbrash Limestone to 2.10m bgl; over
  - » Blisworth Clay to 2.50m bgl, over
  - » Blisworth Limestone to 8.40m bgl, over;
  - » the Rutland Formation to 8.90m bgl, over
  - » the Stanford Member to 12.0m bgl.

2.6 Hydrogeology

2.6.1 Aquifer designations

Based on the inferred geological sequence presented in Section 2.5 and the Environment Agency's interactive aquifer designation map, the aquifer system presented in Table 2.5 applies. Additional information on the hydraulic characteristics of the geological units has been abstracted from Allen et al (1997) and Jones et al (2000).

Table 2.5: Aquifer system

Stratum	Aquifer Designation	Comments
Made Ground (Imported Fill)	Unclassified / unproductive	Artificial ground not included in the classification system, but is likely to be present in the south-west (landfill), the south-east (historical stone quarry) and in the central east (associated with Castle Manor Farm). Likely to be moderate to high porosity because of unconsolidated nature, but permeability is likely to be constrained to low, or low to moderate because of poor sorting and clay content.
Superficial Deposits		
Glaciofluvial Sand & Gravel	Secondary A Aquifer	Intergranular permeability. Dominated by moderate to high permeability layers of sand and occasional gravel, interbedded with low permeability clay. Overall, this unit is likely to be relatively anisotropic in nature with horizontal permeability similar to vertical permeability (i.e. kh>kv). Groundwater flow is likely to be variable and discontinuous as water migrates around low permeability areas.
Oadby Member	Secondary undifferentiated Aquifer	Dominated by low permeability clay, which is interbedded with moderate to high permeability layers of sand with occasional gravel. Likely to be anisotropic in nature
Solid Geology		
Oxford Clay	Unproductive	Dominated by low permeability clay, which are usually unable to provide useable water supplies. Likely to be anisotropic.

Stratum	Aquifer Designation	Comments
Kellaways Sand Member	Secondary A Aquifer	Moderate to high porosity, but permeability likely to be constrained to low or low to moderate because of poor sorting and fines content. The Kellaways Sand yields small supplies of groundwater. Hydraulic conductivity values are very low partly due, to the high fines content of sands.
Kellways Clay Member	Unproductive	Dominated by low permeability clay, which are usually unable to provide useable water supplies. Likely to be anisotropic.
Cornbrash Formation	Secondary A Aquifer	High permeability due to fractured limestone but limited thickness and weathering of unit. The Cornbrash provides small, perched groundwater supplies which tend to dry out during drought periods, especially if hydraulically separate from the Great Oolite Limestone or equivalents.
Blisworth Clay Formation	Unproductive	Dominated by low permeability clay, which are usually unable to provide useable water supplies. Likely to be anisotropic.
Blisworth Limestone Formation	Principal Aquifer	High permeability due to fractured limestone but interbedded with layer of clay. The Great Oolite Limestone maintains its thickness, but the proportion of clays and shales increases to the north-east. As it occurs at high elevations, it tends to be dry, and hence is little used as an aquifer.

2.6.2 Groundwater abstraction

There are no active licensed groundwater abstractions within 1km of the site.

2.6.3 Groundwater source protection zones and groundwater vulnerability

The site is not within a groundwater Source Protection Zone (SPZ).

2.6.4 Groundwater levels, recharge, and flow

A shallow, perched groundwater table is likely to be present within the landfill.

Shallow, possibly perched, groundwater is likely to be present within Glaciofluvial deposits with a deeper groundwater body within the Kellaways Sand Member which may be in vertical connection where outcropping beneath the shown Glaciofluvial deposits.

The presence of the Kellaways Clay Member (although likely limited in thickness) and the Blisworth Clay Formation may inhibit vertical connection into the Cornbrash Limestone Formation and Blisworth Limestone Formation.

Historical BGS records indicate groundwater was encountered at 9.00m bgl within the Glaciofluvial deposits.

The hydraulic gradient of the groundwater is likely to be towards the north-east, encouraging flow towards the Thorpe Brook which flows into River Nene approximately 3km to the north of the site. A number of springs and 'issues' are indicated offsite to the north. There is the potential that the pond around Castle Manor Farm is fed by a spring from the Cornbrash Formation which also feeds Thorpe Brook.

2.6.5 *Groundwater quality*

The groundwater body beneath the site (Northampton Sands) is currently (2019 Cycle 2) classified under the Water Framework Directive as 'Good'.

2.6.6 *Groundwater flooding*

The environmental data report indicates a 'low to moderate risk of groundwater flooding'.

2.7 Hydrology

2.7.1 *Surface water system and drainage*

The surface water features in the vicinity of the site are listed in Table 2.6 and, where appropriate, are marked on the Site Features Plan (Hydrock Drawing 18443-HYD-XX-ZZ-DR-GE-1003) in Appendix A.

Table 2.6: Surface water features

Feature	Location Relative to Site
Small pond	On site – East of Castle Manor Farm
Open drainage ditch	Heading east from the central north of the site. It is assumed the pond drains into the ditch to the north when overflowing based on scar marks observed in concrete track.
Open drainage ditch	Heading west, then north from the eastern site boundary, to the north of Castle Manor Farm. This drain joins the west to east ditch in the north of the site.
Open drainage ditch	Present along the central northern boundary. Heading east, this drain joins the west to east ditch off site, to the north-east of the site.
Thorpe Brook	250 to 400m south-east. This flows to the north and is present to the to the east of Polopit. .
A spring	250m north-east on at the southern edge of Polopit
Surface water features ultimately form part of the River Nene catchment area joining the River Nene approximately 3km to the north and approximately 20m lower than the site levels	

2.7.2 *Surface water abstractions and discharges*

There are no active licensed surface water abstractions within 1km of the site.

There are no active licensed surface water discharges within 1km of the site.

Two historical surface water discharges were present on site:

1. Sewage discharges, related to Castle Manor Farm (Permit number PRNNF01825 revoked on the 11/02/1992); and
2. Trade discharges for mineral workings (Permit number PRNNF12740 effective between 08th July 2002 and revocation date on 11th December 2006).

2.7.3 *Surface water quality*

Reference to the Environment Agency web site shows the site is located within the catchment of the River Nene (Middle Nene) Basin District, with the specific river water body being the Thorpe Waterville Brook.

The current (2019 cycle 2) overall status under the Water Framework Directive is 'poor' with chemical classification noted as a 'fail'. The river water quality is currently 'Poor' status due to phosphate levels, macrophytes and phytenobenthos combined, invertebrates and dissolved oxygen. The objective is for the water body to be classified as 'Moderate' by 2027.

2.7.4 Surface water flooding

The desk study information indicates that the development is not in an area at risk of flooding from rivers (i.e. in Flood Zone 1). No further consideration of flood risk is undertaken in this report. Specialist flood risk advice should be sought with regard to drainage and flooding.

2.8 Mining and mineral extraction and waste management

The site is not located within an allocated mineral site.

The site may be located in a 'Sand and gravel safeguarding area', related to the western part of the site. However, it is difficult to accurately determine this based on the small-scale mapping available on the Northamptonshire County Council web portal, and the potential resource, may already be mined out (see Section 2.8.2). Confirmation should be obtained during planning.

The site is shown by historical mapping to have two areas of quarrying within the site confines. These are 'Old Stone Pits', present in the south-east of the site (detailed in Section 2.8.1) and Rectory Farm Quarry (detailed in Section 2.8.2).

A landfill is present in the south-west corner of the site, known as 'Rectory Farm, Thrapston', this infills Rectory Farm Quarry (detailed in Section 2.8.2). There no further recorded waste management sites within 250m of the site.

2.8.1 'Old Stone Pits'

The older of the two former quarried areas (shown occurring prior to 1885, the earliest available mapping) is shown as 'Old Stone Pits' in the south-east corner of the site. Based on the ground model, it is assumed the Cornbrash Limestone Formation was the material excavated in these works. The detailed lateral and vertical extent of these works are unknown; however, it is likely to have been limited to the south-east corner based on the historical mapping.

It is assumed that these have been backfilled since ground levels during the walkover showed no depressions in this area, and evidence of workings were no longer shown on historical mapping from 1982.

Evidence of disturbance is shown within the archaeological geophysical survey of the site (Oxford Archaeology, July 2021). This indicates the stone pits extend further north and west than is shown in historical plans. An area of approximately 5.15 hectares in the south-east is shown to be 'disturbed' ground which is assumed to correlate to the quarried area. Selected drawings from the Archaeological Report are provided in Appendix A.

2.8.2 Rectory Farm, Thrapston - Sand and Gravel Extraction and Waste Management.

A more recent quarrying (known as Rectory Farm Quarry), and subsequent inert landfilling operation has been undertaken in the south-east of the site. This operation licenced to Mick George Ltd operating under permits dating from between 2004 and September 2015 for Rectory Farm, Thrapston Landfill.

Permitting

The history of the permitting is presented in Table 2.7 below.

Table 2.7: Rectory Farm, Thrapston Planning and Permitting History.

Date	Application Reference	Description
29/12/2000	EN/01/23C	Application for extraction of sand and gravel with restoration to agricultural use by importation of inert waste (including the provision for recycling waste).
08/08/2002	PRNNF12740	Trade discharges for mineral workings, effective between 08th July 2002 and revocation date 11th December 2006.
28/04/2003	BT9879IY	Permit Application
05/07/2004		Permit Determined. 75,000T Limit per year.
17/10/2006	EP3837LU	Variation Notice
05/07/2007	EN/01/23C	Removal of conditions 7 & 8 of planning application EN/01/23C which restricted works in area for road improvements, allowing additional areas to be included.
11/01/2008	PP3233XK	Variation Notice – Increased tonnage of annual waste. 300,000T Year.
22/01/2009	07/00035/MIN	Extension of end date to 30th September 2015.

The area of the permitted operations is presented in Figure 2.15 (not to scale). The original is provided in Variation Notice Number EP3837LU, for Permit number BT9879IY, provided in Appendix D.

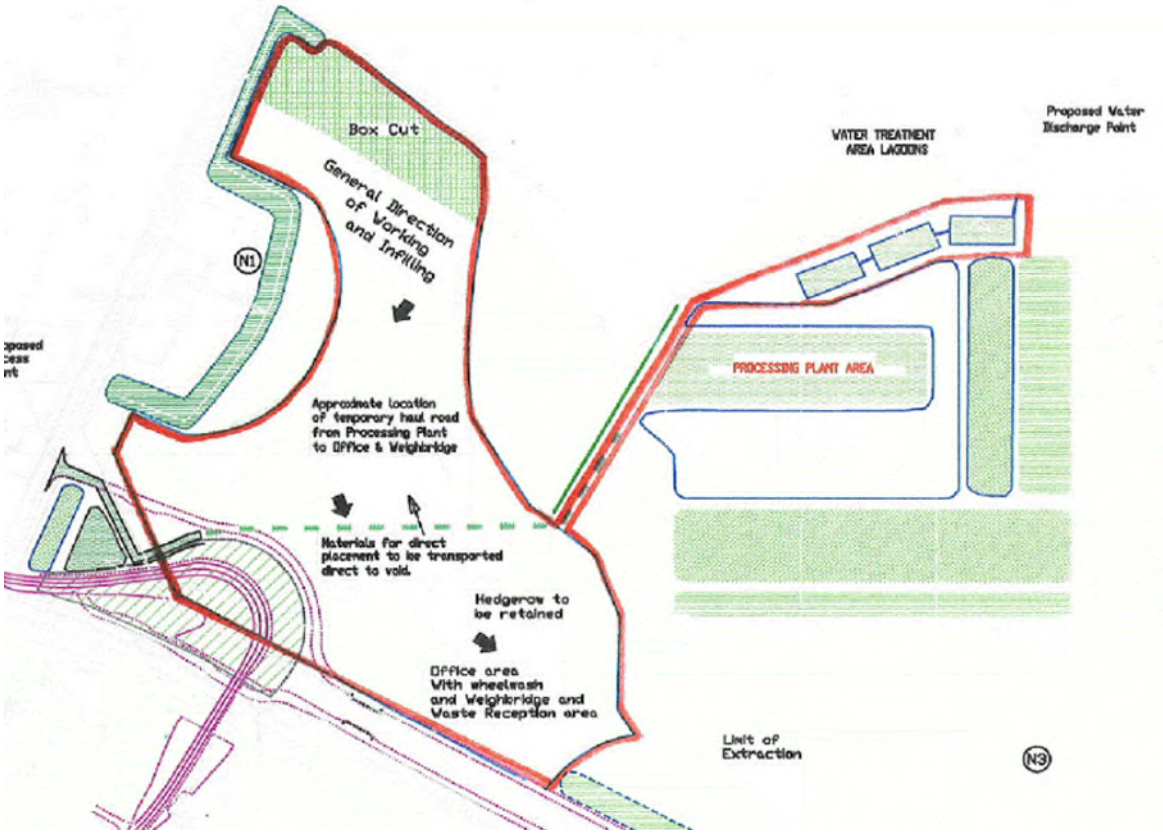

Figure 2.15: Extent of Quarry and Landfilling Operation

Schedule 2 Site plan obtained from 2006 Variation notice with introductory note

Operation

Whilst no details have been provided with regards to the nature of depths of excavations, it is assumed that the sand and quarry operation removed the Glaciofluvial and possibly the Kellaways Sand as part of the operation. Therefore, the anticipated thicknesses of excavation and subsequent landfilling are in the order of up to 10m in the south and west and decreasing towards the north and north-east based on the anticipated outcrop of the Kellaways Sand Member from geological mapping.

Based on data provided by Mick George Limited, it is understood that the site has 'been engineered with an artificial geological barrier to the base and reshapes side slopes with a maximum permeability of $1.0x10^{-7}$ m/sec and a thickness of 1.0m measured perpendicular to the slope' (Section 1.1.8 of the Thrapston Landfill Site – Construction Quality Assurance Plan for the Drilling of In Waste Gas Monitoring Boreholes report reference A109017 QP01 produced by WYG)

As shown on Figure 2.16, the quarry area comprised a total of 8 landfill cells with Cells 3 and 7 subdivided into smaller cells. A number of water treatment lagoons and processing areas (not shown on Figure 2.16, but indicated on Figure 2.15) were also present to the north-east of the quarry and landfilling area.

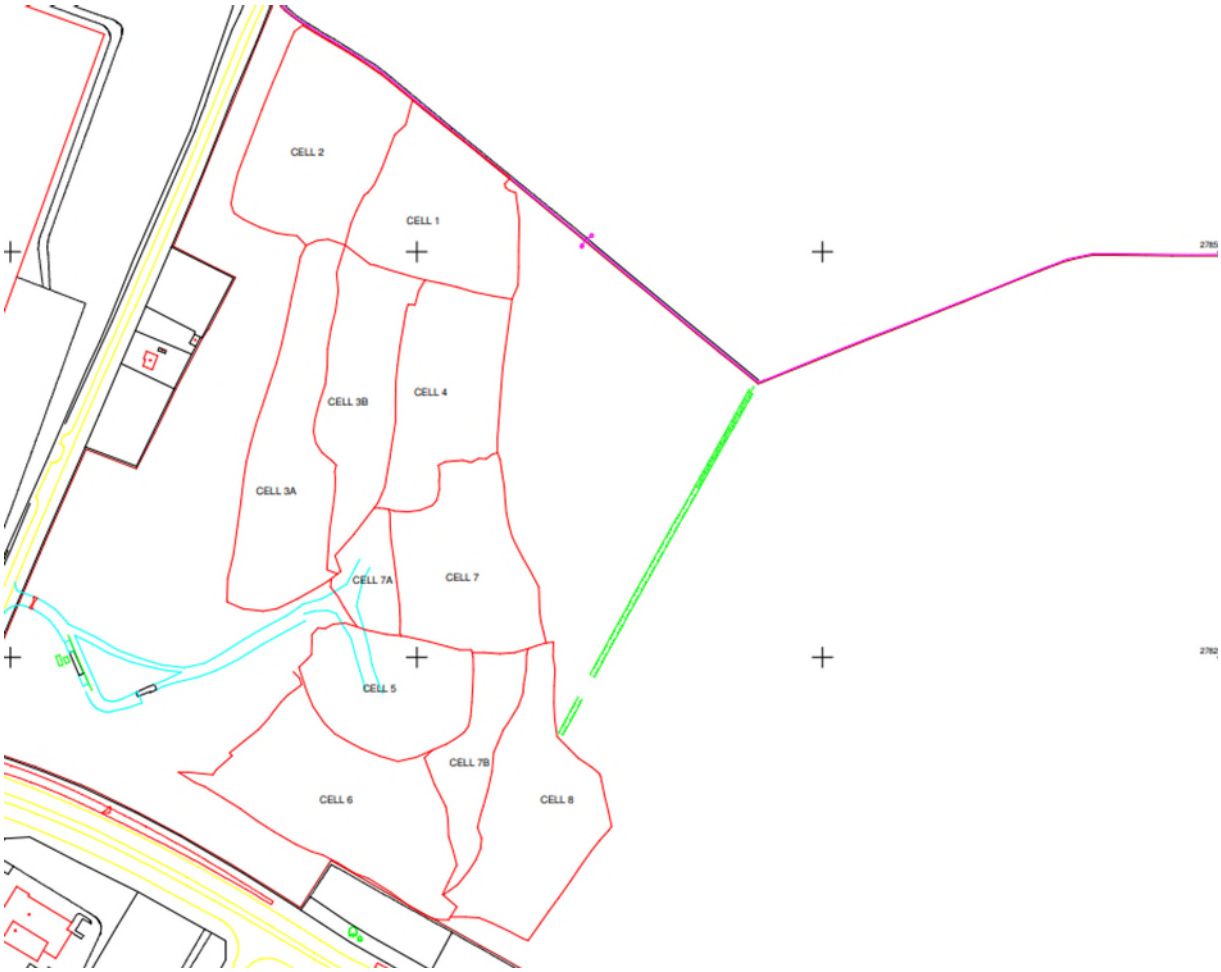

Figure 2.16: Thrapston Quarry – Cell Location Plan. Mick George Ltd Ref MG210/51.

Obtained from Tetratech landfill closure report, Reference B026487.

Selected photographs provided by Mick George Ltd of the quarry in operation and subsequent landfilling are provided in Figures 2.17 to 2.20. The original document is provided in Appendix D.

Figure 2.17: Cell 5 engineered basal liner and side wall. Intracell bund in background.

Figure 2.18: Restored Area across Cell 7,4,1 and 2.

Figure 2.19: Second drainage lagoon.

Figure 2.20: Remaining void 2015.

The landfill operation ceased in 2015 and the ground has been restored to surrounding ground levels along with the settlement ponds. However, it is understood that the licence is yet to be surrendered.

Closure

Hydrock has received copies of the 'Thrapston Landfill Site Construction Quality Assurance Plan for the Drilling of In Waste Gas Monitoring Boreholes', Reference A109017, produced by WYG on behalf of Mick George Limited (July 2018). This report details the Construction Quality Assurance (CQA) Plan for the drilling of 15 boreholes to allow ongoing ground gas monitoring at the landfill. Records of the completed boreholes have not been provided to Hydrock. A copy of this report is provided in Appendix D.

Hydrock has been provided with a copy of the landfill closure report, which relates to permit number PP3233SK (Reference B026487, produced by Tetratech on behalf of Mick George, and dated February 2021).

A copy of the closure report is provided in Appendix D. The landfill closure report concludes:

- *'Waste disposal activities ceased in July 2015'.*
- The site as of February 2021 was *'fully restored and all site operations have ceased'*, with *'all infrastructure removed'.*
- *'The site does not represent a long-term stability risk'.*
- *'Due to the inert nature of the waste, there will be no leachate generated at the site and therefore no leachate management or monitoring is required'.*
- *'…no organic matter is present, and it is therefore considered that the inert waste materials deposited at the site will not give rise to significant quantities of landfill gas. Concentrations of landfill gas are therefore considered to be negligible and no active gas management is required'.*
- *'…. waste landfill gas monitoring infrastructure was installed within each completed cell as shown on Drawing Number A109017-BLP-01B. The boreholes will be monitored every six months during the aftercare, for concentrations of methane, carbon dioxide and oxygen'.*
- '*Due to the inert nature of the wastes deposited, no groundwater management system is required…'.*
- *'There are no surface watercourses or discharges from the site, therefore no monitoring is required'.*
- *'Due to the inert nature of the waste, there will be no leachate generated at the site and therefore no leachate management or monitoring is required'.*
- *'Groundwater will be monitored in borehole GW2 on the site boundary until the permit is surrendered'.*
- *'…it's considered that the risk to habitats (as detailed in Table 1) following the closure of the landfill is considered to be low.'*
- *'….it is considered that there is no increased risk to groundwater and therefore it is considered that a revised HRA is not required'.*
- *'….it is considered that there is no increased risk and as such a revised Landfill Gas Risk Assessment is not required'*
- *'The completion works undertaken at the site have ensured that the site is causing minimal disruption to the surrounding environment and human health. The environmental impact monitoring and mitigation measures detailed will ensure that there will be no permanent impact from the proposed works.'*

Ground gas monitoring

Monitoring data has been provided to Hydrock by the Environment Agency with ground gas data from 4 locations (GW1 – GW3 and Gas 1) available for review from July 2009, to March 2021.

As part of the works associated with closure of the landfill, 14 gas monitoring wells (BH1 – BH14) were installed within each completed cell (as shown on Mick George Drawing A109017-BLP-01B). The logs of these boreholes have not been provided to Hydrock.

A summary of the monitoring results is presented in Table 2.8.

Table 2.8 Historical Gas Monitoring undertaken by

Date	Monitoring Points	Response Zone	Water Level (m bgl)	CH_4 (%)	CO_2 (%)	O_2 (%)
31/03/21	BH1 – BH14	Unknown	Not recorded	0.0 – 0.1	0.2 – 2.7	11.5 – 21.0
21/11/09 – 21/03/18	Gas 1	Unknown (Assumed within landfill)	8.91 (1 reading only)	0.0 – 9.8	0.0 – 3.3	9.1 – 21.5
05/07/09 – 05/11/21	GW1	Unknown	0.0 – 10.0	0.0 – 0.3	0.1 – 1.6	17.2 – 21.0
15/09/09 – 05/11/21	GW2	Assumed Natural 12.0 – 24m gravel filter.	0.50 – 21.57	0.0 – 0.2	0.0 – 1.4	12.2 – 21.2 (78.2 reading excluded)
05/07/09 – 05/11/21	GW3	Natural (Various)	8.42 – 21.18	0.0 – 0.2	0.2 – 2.1	0.1 – 21.9

Ground water monitoring

Groundwater monitoring has been undertaken external of landfill areas between the 5th July 2009 and the 9th March 2021 for GW1 to GW3 although GW3 has been recorded as 'destroyed' since September 2016. Whilst the results span across the period, the monitoring results provided are not continuous. Between 1 and 5 visits were undertaken per year with an absence of data in 2017 and between March 2018 and May 2020.

2.9 Natural ground instability

Trees and hedges are present around the site boundaries and sporadically across the site. Cohesive deposits of the Glacial Till, Oxford Clay Formation, Kellaways Clay Member and Blisworth Clay Formation may be affected by potential for shrink-swell ground movements in clays as a result of changes in moisture content from removal or growth of trees.

The risks of solifluction and land slipping which are discussed in detail in Section 2.10.

2.10 Cambering, gulls and periglacial slip surfaces

2.10.1 Background

The site is on a valley side, sloping down to a brook to the east of the site. The upper parts of the slope are underlain by strata resistant to erosion such as the Cornbrash Formation or Blisworth Limestone and these overlie mudstones / clays such as the Blisworth Clay Member and the Rutland Member on sloping valley sides with river erosion at the toe of the slope. The combination of the above ground conditions is often associated with ground instability from solifluction, cambering and gulls as discussed below.

The slope down to a low point in the centre middle of the site originated in the immediate post-glacial era as a result of erosion initially from ice and then likely from glacial outwash as the ice sheet and glaciers melted. In addition, the ground, which had been frozen to form permafrost during the glaciation seasonally melted causing repeated freeze-thaw cycles and as it did so, the clay softened and downslope creep occurred.

Slopes affected by post glacial ground movements may be only marginally stable, with very low factors of safety. Slope failures can be reactivated by small changes in conditions, either by increasing disturbing forces (e.g. placing a load on a slope) or reducing the resisting forces (e.g. removal of toe resistance, or increasing groundwater pore pressure). In addition to slope failures, long term downslope movement (creep movement) in the clay can cause cambering of the overlying cap rock, which weathers to form Head (or Solifluction deposits) and develops fissures known as gulls which can open up creating subsidence risks.

2.10.2 Cambering and gulls

Cambering can occur in periglacial periods, where competent and permeable caprock (e.g. limestone, sandstone or ironstone) overlies less competent ground conditions (e.g., clay, mudstone, siltstone, and sand). During glaciation, following valley incision, the incompetent material moved downslope from beneath the caprock, initially as a result of stress relief and also due to reduction in shear strength associated with pore pressure increases during thawing. The overlying competent beds develop a local dip, or 'camber', toward the valleys.

'Gulls' form during the early stages of cambering which leads to the development of large, joint-bounded blocks of limestone, with extensional downslope movement opening the joints and leading to the development of cavities (known as gulls) between the blocks. Gulls are typically orientated parallel to the contours of an escarpment and normally persist in clusters at a distance from the crest, governed by geomorphology and geology. With time, this process breaks the caprock into discrete blocks 'floating' in the medium of the underlying, weaker strata.

Whilst there is no direct evidence of 'cambering' or 'gulls' occurring at this site, the desk study has identified the presence of limestone and ironstone rock horizons on topographical slopes, along with valley systems below the site. As such, this combination of factors is considered to pose a potential risk of 'gulls' occurring beneath parts of the site. Further investigation is required to verify if these conditions exist and whether they pose a geotechnical risk to the proposed development.

2.10.3 Periglacial slip surfaces

Based on the anticipated site conditions, the upper parts of the slope are underlain by strata resistant to erosion (Cornbrash Formation and Blisworth Limestone Formation) and the sloping valley sides comprise mudstones / clays (Blisworth Clay Formation and Rutland Formation), with potential former erosion within the river valley feature. Although slope angles on site are generally less than 7^0, areas of the site in the north are present, where the gradients increase up to approximately 10^0.

Hydrock considers that any modification of the slope angle from cut and fill works, and the formation of excavations will require careful consideration as there could be a risk of initiating slope failure.

Further investigation is required with regards to the potential presence of periglacial slip surfaces and if present, these will need to be taken into account in the design.

2.11 Regulatory Information

Information in the GroundSure Report (Appendix D), relating to various regulatory controls has been reviewed, with a summary presented below in Table 2.9.

Table 2.9: Regulatory information within 500m of the site

Regulatory Data	Distance from Site	Details	Potential Risk	Comment
Discharge Consents	On site	Castle Manor Farm Sewage Discharges Receiving water – Tributary of the River Nene Revocation 1992	No	Whilst these are on site (and up gradient of surface water courses, these are not considered a risks due to the age of the revocation and the amount of time, which has since passed.
	On Site	Rectory Farm Trade Discharges Receiving water Tributary of Polopit Brook Revocation 2006.		
Local Authority Pollution Prevention and Controls	N/A	No pollution prevention and controls within 500m of the site.	No	-
Pollution Incidents	79m south	July 2003, Diesel, Category 3 – Land minor incident.	No	Whilst relatively close to the site, this is a minor incident and was over 15 years ago.
	81m south-west	October 2002, General biodegradeable material, Category 3 – Land minor incident.	No	Whilst relatively close to the site, this is a minor incident and was over 15 years ago.
Fuel Station Entries	N/A	No entries of fuel stations within 500m of the site.	No	-
Control of major accident hazards sites (COMAH)	N/A	No entries of COMAH sites within 500m of the site.	No	-
Registered radioactive substances	N/A	No entries on registered radioactive substances were recorded within 500m of the site.	No	-
Notification of installations handling hazardous substances	173m west	DHL – Liquified petroleum gas storage.	No	Due its distance from the site and the managed nature of the installation.

2.12 Potential ecological receptors

There are a number of potential ecological receptors present in the area of the site. These are summarised in Table 2.10.

Table 2.10: Potential ecological receptors

Receptor	Category	Distance (m)	Direction from Site
Aldwincle Marsh & The Upper Nene Valley Gravel Pits	SSSI / Ramsar/ SPA	1300	North-west
Titchmarsh meadow	SSSI	1666	North-east

2.13 Natural soil chemistry

Information contained within the environmental report (Appendix D) gives indicative (estimated) concentration values for the natural soils at the site for a selection of Contaminants of Potential Concern (CoPC). These have been reproduced in Table 2.11.

Table 2.11: Natural soil chemistry

Element	Arsenic	Cadmium	Chromium	Lead	Nickel
Concentration (mg/kg)	15-25	<1.8	60 - 90	100	15 - 45

2.14 Radon

The radon risk is reported in the environmental report which indicates that the site is not in a Radon Affected Area and radon protection measures are not required for new buildings at the site.

2.15 Unexploded ordnance (UXO)

A specialist UXO risk assessment has been commissioned from EOD Contracts (Ref: EOD/21/21249/DTS, provided in Appendix D, which indicates that there was a Light Anti-Aircraft (LAA) Battery located on the site during WW2 along with a nearby military establishment.

The UXO risk assessment concludes the UXO risk level is LOW, as long as all personnel carrying out intrusive works are provided with UXO safety awareness training.

3. INITIAL CONCEPTUAL SITE MODEL

3.1 Introduction

The initial Conceptual Site Model (iCSM) incorporates evidence from the site walkover, the Desk Study and previous investigations carried out at the site. The formulation of an initial Conceptual Site Model is a key component of the LCRM methodology. The iCSM incorporates a ground model of the site physical conditions and an exposure model of the possible contaminant linkages; it forms the basis for Generic Quantitative Risk Assessment (GQRA) in accordance with current guidelines.

3.2 Ground model

The preliminary ground model presented in Section 2 provides an understanding of the ground conditions and is the basis for preparing the preliminary geotechnical hazard assessment (Section 3.3) and the preliminary geo-environmental exposure model (Section 3.4)

3.3 Geotechnical hazard identification

3.3.1 Context

The preliminary geotechnical hazard identification has been undertaken in accordance with the general requirements of ICE/DETR Document 'Managing Geotechnical Risk' and the HE documents HD 41/15 and CD 622.

The following section sets out the identified geotechnical hazards and the development elements potentially affected (see Table E.1 in Appendix E for further information).

3.3.2 Plausible geotechnical hazards

Plausible geotechnical hazards identified at the site are:

- Uncontrolled Made Ground (variable strength and compressibility), associated with the landfill in the south-west, the infilled 'Old Stone Pits' in the south-east, and around Castle Manor Farm.
- Soft / loose compressible ground (low strength and high settlement potential), potentially associated with the drainage ditches in the central north of the site.
- Low strength, compressible ground, associated with the Superficial Deposits and the upper profile of the Kellaways Formation and Blisworth Formation (near surface softening) – risk of shear failure and excessive settlement of foundations, roads and infrastructure elements.
- Shrinkage / swelling of the clay fraction of soils under the influence of vegetation.
- Variable lateral and vertical changes in ground conditions, due to the presence of highly variable ground conditions (Made ground, sand and gravel, soft clay, stiff clay and rock).
- Attack of buried concrete by aggressive ground conditions due to elevated sulphates in natural soils and landfill Made Ground.
- Obstructions related to existing construction, materials within the landfill and rock strata.
- Shallow groundwater, perched within the landfill, the glaciofluvial sand and gravel deposits and within limestone horizons.
- Changing groundwater conditions, both seasonally (as the groundwater flux changes), and vertically (as the ground conditions vary across the site).

- Potential for sub-artesian water within the Kellaways Formation and Cornbrash Formation (and associated pore water pressure increases in the Oxford Clay Formation).
- Risk from erosion or flooding, associated with the drainage ditches across the central and northern parts of the site.
- Running sands and loose Made Ground, leading to difficulty with excavation and collapse of side walls.
- Slope stability issues – general slopes (cut and fill).
- Slope stability issues – retaining walls or reinforced slopes (if required).
- Earthworks – poor bearing capacity of new fill.
- Earthworks – unsuitability of site won material to be reused as fill.
- Earthworks – settlement of underlying soils during filing (where significant thickness of fill is placed).
- Earthworks – settlement of placed fill.
- Earthworks – unsuitability of site won material to be reused as fill.
- Possible cambered ground and gulls.
- Relict slip surfaces.
- Potential for unforeseen ground conditions.

3.3.3 Potential development elements affected

Development elements potentially affected by geotechnical hazards are:

- Buildings – foundations.
- Buildings – floor Slabs
- Roads and pavements.
- Services.
- General slopes.
- Retaining walls or reinforced soils (if proposed).
- Landscaping.
- Construction staff, vehicles and plant operators.
- Concrete below ground.
- Earthworks control, inability to place and compact fill.
- Insufficient fill to complete earthworks.

Health and safety risks to site Contractors and maintenance workers have not been assessed during these works and will need to be considered separately during design.

3.4 Geo-environmental exposure model

3.4.1 Context

The preliminary exposure model is used to identify geo-environmental hazards and to establish potential pollution linkages, based on the source-pathway-receptor (SPR) approach.

A viable pollution linkage requires all the components of an SPR to be present. If only one or two are present, there is no linkage and no further assessment is required.

3.4.2 Potential contaminants

For the purpose of this assessment the potential contaminants have been separated according to whether they are likely to have originated from an on-site or off-site source.

3.4.2.1 Potential on-site sources of contamination

- Made Ground associated with the landfill materials in the west, possibly including elevated concentrations of metals, metalloids, asbestos fibres, Asbestos Containing Materials, PAH and petroleum hydrocarbons (S1).
- Made Ground associated with the 'Old Stone Pits' in the south-east possibly including elevated concentrations of metals, metalloids, asbestos fibres, Asbestos Containing Materials, PAH and petroleum hydrocarbons (S2).
- Made Ground associated with the Castle Manor Farm and access roads in the centre west possibly including elevated concentrations of metals, metalloids, asbestos fibres, Asbestos Containing Materials (ACM), polyaromatic hydrocarbons (PAH) and petroleum hydrocarbons (S3).
- Petroleum hydrocarbons and VOC from Above Ground Storage Tanks (ASTs), the pipework between tanks and pumps, and general spillage around Manor Castle Farm (S4).
- Ground gases (carbon dioxide and methane) from organic materials in the Landfill (S5).
- Ground gases (carbon dioxide and methane) from organic materials in the Made Ground associated with 'Old Stone Pits' and around Castle Manor Farm. (S6).
- Asbestos within existing buildings and used around Castle Manor Farm complex including the chicken shed (S7).
- Pesticides & Herbicides associated with historical farming practices (S8).

3.4.2.2 Potential off-site sources of contamination

No potential off-site sources of contamination have been identified.

3.4.3 Potential receptors

The following potential receptors in relation to the proposed land use have been identified.

- People (neighbours, site end users) (R1).
- Development end use (buildings, utilities and landscaping) (R2).
- Groundwater: Secondary A aquifer status of the Glaciofluvial Deposits, Kellaways Sand Member, Cornbrash Formation and Principal Aquifer status of the Blisworth Limestone (R3).
- Surface water: on-site drainage ditches and pond and Thorpe Brook located offsite to the north-east (R4).

3.4.4 Potential pathways

The following potential pathways have been identified.

- Ingestion, skin contact, inhalation of dust and outdoor air by people (P1).
- Methane ingress via permeable soils and/or construction gaps (P2).

- VOC and petroleum hydrocarbon vapour ingress via permeable soils and/or construction gaps (P3).
- Root uptake by plant (P4).
- Migration of contaminant via leachate migration through the unsaturated zone in various lithologies (P5).
- Migration of contaminant from horizontal migration of groundwater within various lithologies (P6).
- Surface water via overland flow (P7).
- Surface water, via drainage discharge (P8).
- Surface water via base flow from groundwater (P9).

Health and safety risks to site development contractors and maintenance workers have not been assessed as part of this study and will need to be considered separately.

The above sources, pathways and receptors have been considered as part of the Preliminary Risk Assessment in accordance with LCRM (2021), are considered to be plausible in the context of this site and have been carried forward for investigation and assessment.

4. WASTE MANAGEMENT

Based on provided cut to fill models it is anticipated a large cut to fill operation to create a development platform will be undertaken across the site with up to 11m of cut in the southwest and up to 8m of fill in the north to create a development platform at 53.72m OD. Surrounding landscape bunds of up to 10.50m above the development platform in the north and 7.50m above the development platform in the east are proposed at slope angles of a maximum 1:3 gradient with cut slopes at 1:3.5 gradient in the south and west.

It is understood that approximately 1,600,200m^3 of cut will be required (in addition to 192,825m^3 of topsoil strip), with fill requirements of approximately 1,307,021m^3 for the development platform and 485,897m^3 required to construct the landscape screening bunds. Over-excavation of soils (in addition to the above) may also be required to obtain geotechnically suitable fill for the various parts of the site.

The requirement for the above volumes of soil is set by the need to create visual and landscape screening bunds, with the hight of the bunds set as part of the landscape visual assessment and planning.

It will be necessary for all works to be carried out in full compliance with current regulations and guidance, with regard to environmental permitting and waste recovery. Given the presence of a landfill on the site, and the need to the landfill materials to be re-used (recovered) as part of the cut to fill works, there will be a requirement for significant Environment Agency discussion and an application for a Deposit for Recovery Permit to allow the landfill Made Ground to be 'recovered'.

A fundamental principle of any works moving forward is the expectation that the earthworks to create the required development platform will constitute the primary remedial works to achieve the geo-environmental objectives and create a site that is Suitable for Use.

In order to undertake waste management in accordance with the regulatory requirements, management of materials excavated from the site will need to be undertaken in accordance with both:

- A bespoke deposit for recovery (DFR) permit (to allow 'recovery' of the existing landfill materials); and
- A Materials Management Plan, prepared and declared in accordance with the Definition of Waste Code of Practice (V2) to manage non-landfill materials excavated and placed as part of the earthworks.

5. DESK STUDY CONCLUSIONS

5.1 Geotechnical conclusions

The following plausible geotechnical risks are identified.

- Uncontrolled Made Ground (variable strength and compressibility), with the landfill in the south-west, the infilled 'Old Stone Pits' in the south-east, and around Castle Manor Farm - settlement or differential settlement of foundations, floor slabs, roads and infrastructure elements.
- Soft / loose compressible ground (low strength and high settlement potential), potentially associated with the drainage ditches in the central north of the site.
- Low strength, compressible ground, associated with the Superficial Deposits and the upper profile of the Kellaways Formation and Blisworth Formation (near surface softening) – risk of shear failure and excessive settlement of foundations, roads and infrastructure elements.
- Shrinkage/swelling of clay – settlement/heave of foundations, especially when located within the influence of trees and vegetation.
- Variable lateral and vertical changes in ground conditions, due to the presence of highly variable ground conditions (Made ground, sand and gravel, soft clay, stiff clay and rock) – potential for differential settlement.
- Attack of buried concrete by aggressive ground conditions – the development site may contain Made Ground and potentially sulfate bearing soils.
- Potential for obstructions and the risk of instability of excavations, associated with landfill, localised areas of historical construction and rock strata, with the impact on construction staff, vehicles and plant operators.
- Shallow groundwater, perched within the landfill, the glaciofluvial sand and gravel deposits and within limestone horizons and the potential impact on permanent construction and temporary works.
- Changing groundwater conditions, both seasonally (as the groundwater flux changes), and vertically (as the ground conditions vary across the site) and the potential impact on permanent construction and temporary works.
- Potential for sub-artesian water within the Kellaways Formation and Cornbrash Formation (and associated pore water pressure increases in the Oxford Clay Formation).
- Risk from erosion or flooding, associated with the drainage ditches across the central and northern parts of the site.
- Running sands and loose soils associated with the River Terrace Deposits and shallow groundwater, leading to difficulty with excavation due to trench instability.
- Potential for slope stability issues, including general slopes, man-made slopes and retaining walls / features.
- Land raised areas – self-weight settlement, long term creep settlement and inundation settlement.
- Earthworks – low bearing capacity or settlement of new fill and impact on foundations, floor slabs, roads and infrastructure and construction plant.
- Earthworks – unsuitability of site won material to be reused as fill.

- Potential for possible cambered ground, gulls and relict slip surfaces and associated slope instability.
- Potential for unforeseen ground conditions and the risks associated with limited data.

These plausible risks require further investigation and assessment (see Section 7).

5.2 Geo-environmental conclusions

Based on historical and current land uses and the assessment undertaken in this report:

- It is considered that it is unlikely that the site would be classified as Contaminated Land under Part 2A of the EPA 1990.
- The overall risk from land contamination at the site is considered generally to be low for the current development.
- The overall risk for a redeveloped site is assessed to be low, with some specific potentially moderate to high risks, but this would need to be confirmed by appropriate intrusive investigation, testing and assessment of the results of the investigation.

The possible pollutant linkages (for risk levels of moderate or greater) on an unremediated redeveloped site, as determined by the desk study and walk-over, are summarised in Table 5.1:

Table 5.1: Possible Pollutant Linkages (for Risk Levels of Moderate or Greater)

Source(s)	◄ potential Impact on ►	Receptor(s)
Metals, metalloids, PAH, TPH and asbestos in Made Ground associated with the 'inert' landfill in the south-west.		Site users. Surface Water. Groundwater. Surface Water Pipes
Metals, metalloids, PAH, TPH and asbestos in Made Ground associated with the 'Old Stone Pits' in the south-east.		
Metals, metalloids, PAH, TPH and asbestos in Made Ground associated with the Castle Manor Farm and access road.		
Petroleum hydrocarbons and VOC from AST in Castle Manor Farm.		
Ground gases (carbon dioxide and methane) from organic materials in the Landfill, Made Ground around Castle Manor Farm and the 'Old Stone Pits'.		Site Users, Neighbours Buildings
Asbestos fibres from insulation or Asbestos Containing Materials in the buildings and around the farm.		On Site Neighbours

The possible contaminant sources and pollutant linkages require further investigation and assessment (see Section 7).

6. UNCERTAINTIES AND LIMITATIONS

Hydrock Consultants Limited (Hydrock) has prepared this report in accordance with the instructions of Equites Newlands (Thrapston East) Limited (the Client), by e-mail dated 30th April 2021 under the terms of appointment for Hydrock, for the sole and specific use of the Client and parties commissioned by them to undertake work where reliance is placed on this report. Any third parties who use the information contained herein do so at their own risk. Hydrock shall not be responsible for any use of the report or its contents for any purpose other than that for which it was prepared or for use of the report by any parties not defined in Hydrock's appointment.

This report details the findings of work carried out between August and November 2021. The report has been prepared by Hydrock on the basis of available information obtained during the study period. Although every reasonable effort has been made to gather all relevant information, not all potential environmental constraints or liabilities associated with the site may have been revealed.

Information provided by third parties has been used in good faith and is taken at face value; however, Hydrock cannot guarantee its accuracy or completeness.

Where the existing report(s) prepared by others have been provided by the Client, it is assumed that these have been either commissioned by the Client, or can be assigned to the Client, and can be relied upon by Hydrock. Should this not be the case Hydrock should be informed immediately as additional work may be required. Hydrock is not responsible for any factual errors or omissions in the supplied data, or for the opinions and recommendations of others. It is possible that the conditions described may have since changed through natural processes or later activities.

The work has been carried out in general accordance with recognised best practice. The various

Please note that notwithstanding any site observations concerning the presence or otherwise of archaeological sites, asbestos-containing materials or invasive weeds, this report does not constitute a formal survey of these potential constraints and specialist advice should be sought.

Any site boundary line depicted on plans does not imply legal ownership of land.

7. RECOMMENDATIONS FOR FURTHER WORKS

7.1 Further Desk Study Works

Hydrock understand that boreholes have been installed in the landfill as part of the landfill closure reporting (BH1 – BH14). Borehole logs have not been provided. It is recommended that copies of the previous boreholes are obtained and the data added to future iterations of this report.

7.2 Ground investigation objectives

In order to confirm the actual risks to receptors and confirm the ground conditions with respect to potential geotechnical and geo-environmental risks, an appropriate intrusive Phase 2 investigation will need to be undertaken. This investigation will need to:

- determine the depth and distribution of Landfill, Made Ground and natural strata across the site;
- determine the soil strength/density profile beneath the site;
- determine the depth/level of groundwater beneath the site;
- determine the ground gas concentrations beneath the site;
- determine CBRs to assist with pavement design;
- assess trench stability, over break potential and 'diggability';
- allow sampling for chemical and geotechnical laboratory testing;
- allow soil classification to allow geotechnical characterisation and determine suitability for reuse of soils within earthworks;
- obtain information in terms of Aggressive Chemical Environment for Concrete Class (ACEC Class).

Following investigation, assessment will be required to:

- update the Ground Model;
- update the Geotechnical Risk Register;
- provide Geotechnical Design recommendations;
- update the Conceptual Site Model (CSM), including identification of plausible pollution linkages;
- undertake generic quantitative risk assessment of potential chemical contaminants to establish 'suitability for use' under the current planning regime;
- discuss potential environmental liabilities associated with land contamination (soil, water and gas); and
- provide outline mitigation recommendations to ensure the site is 'suitable for use'.

7.3 Proposed scope and rationale for investigation works

Based on the current data, and acknowledging limited access to the site due to planted crops, a preliminary site investigation is to comprise:

- the excavation of trial pits in the south-west to allow collection of samples for geotechnical and chemical analysis, to assess trench stability, over break potential and 'diggability';
- the advancement of cable percussive boreholes to allow collection of samples for geotechnical and chemical analysis of deeper soils, and allow *in situ* testing (SPTs) to be undertaken to determine the

extents of the landfill in the southeast and allow the installation of gas and groundwater monitoring wells;

- the advancement of rotary percussive boreholes to allow collection of samples for geotechnical and chemical analysis of deeper soils, and allow *in situ* testing (SPTs) to be undertaken (limited to tracks only)
- Hand pits within cropped fields to collect samples for chemical analysis.
- gas and groundwater monitoring installations to allow gas concentrations and groundwater levels to be monitored;
- Preliminary monitoring of gas concentration and groundwater levels;
- geotechnical testing of soils; and
- contamination analyses of soil and groundwater.

The preliminary investigation detailed above is reported in Hydrock Reports 18443-HYD-XX-XX-RP-GE-1003 – 1005. Detailed site investigation will be required at a later date.

Following detailed investigation, design of the remediation and earthworks. This will require detailed discussions and agreement with regulators, including the Environment Agency regarding waste and materials management. The further works are not required to be undertaken pre-planning and are to assist with design of the development.

During earthworks and remediation, site audits and verification will be required.

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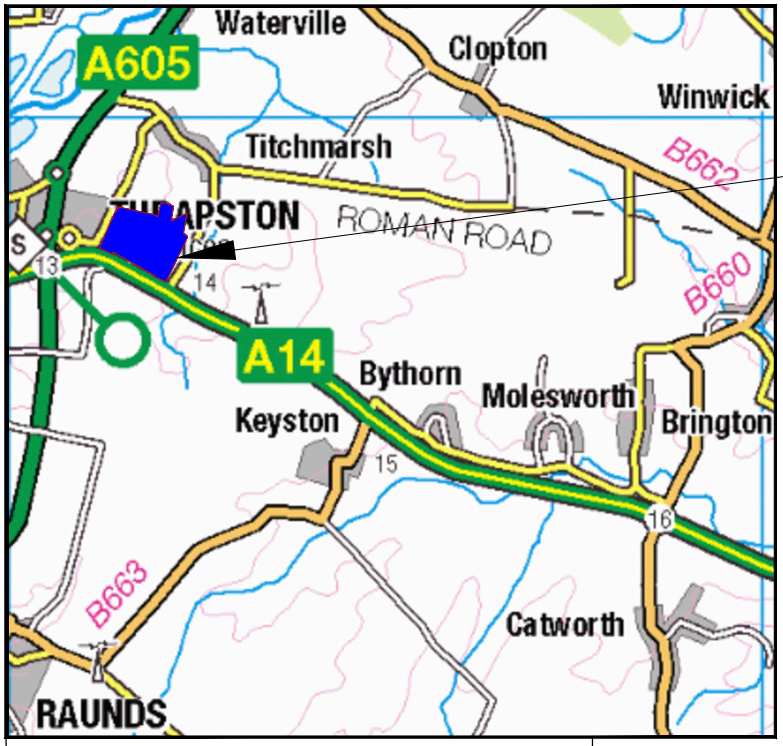
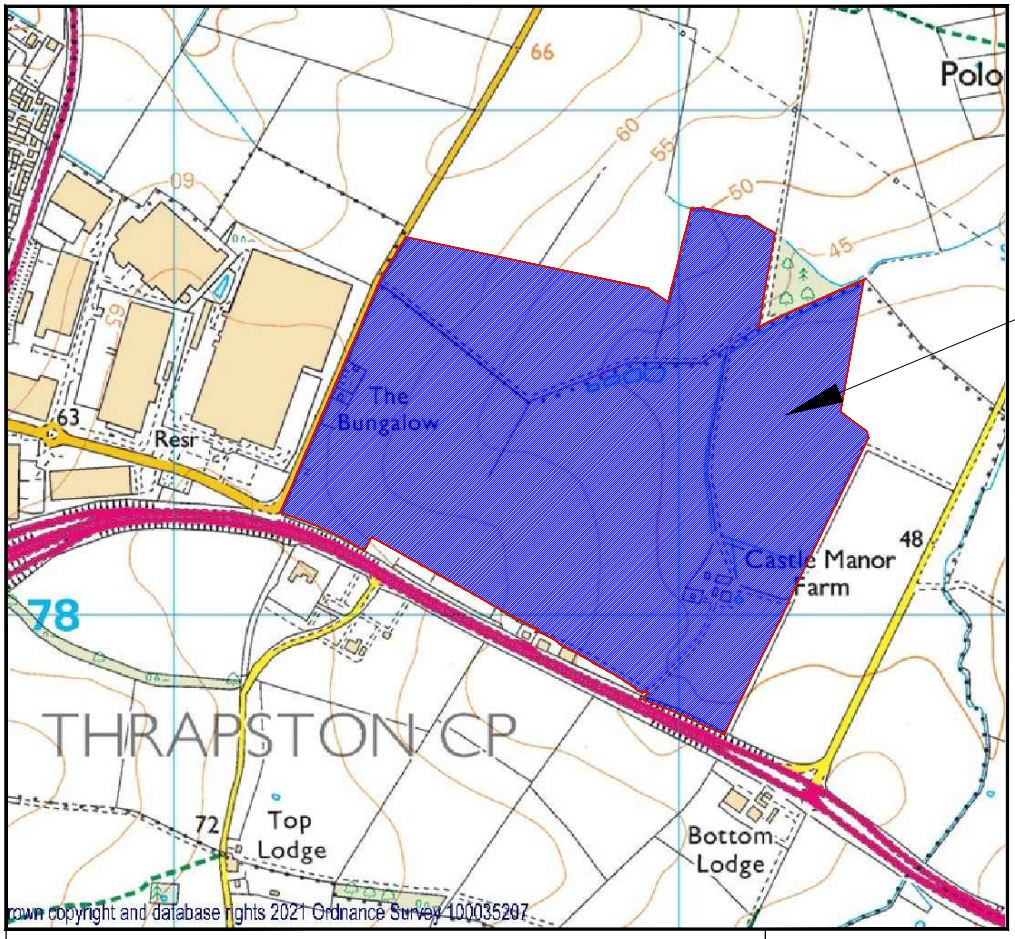
Appendix A Drawings

OS NORTH



THE SITE



THE SITE

REV						
P03	Client Name Updated					
	NT	15.12.21	NT	15.12.21	AB	15.12.21
P02						
	SD	08.11.21	NT	08.11.21	AB	08.11.21
P01	FIRST ISSUE					
	SD	16.08.21	NT	16.08.21	AB	16.08.21
REV	REVISION NOTES/COMMENTS					
	DRAWN BY	DATE	CHECKED BY	DATE	APPROVED BY	DATE

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CLIENT

Equites Newlands (Thrapston East) Limited

PROJECT

LAND ADJACENT HALDENS PARKWAY
THRAPSTON

TITLE

SITE LOCATION PLAN

HYDROCK PROJECT NO.	SCALE @ A4
C-18443-C	See Drawing

PURPOSE OF ISSUE	STATUS
SUITABLE FOR INFORMATION	S2

DRAWING NO. (PROJECT - ORIGINATOR-VOLUME-LEVEL-TYPE-ROLE-NUMBER)	REVISION
18443-HYD-XX-ZZ-DR-GE-1001	P03

OVERALL RED LINE AREA
74.83 ha / 184.90 acres

PLOT 1 BOUNDARY

Legend:
Outline Application Red Line
Detailed Plot 1 Application Red Line

Revisions:

P03	Additional land for biodiversity added	27.10.21 RM
P04	Red line amended to Titchmarsh roadway	03.11.21 RG
P05	Substation included within Plot 1 Area	16.12.21 RG
P06	Red line to Plot 1 updated	04.01.22 RG
P07	Status of drawing updated to Planning	11.01.22 RG
P08	Road names & Legend added	31.01.22 RG

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HUNTINGDON ROAD
THRAPSTON

LOCATION PLAN

Status	PLANNING
Drawn by : RG	Checked by : RM
Date	01/04/2021

Document Number:

Project Code	Zone	Level-Info	Type	Role	Job No.	Drg.No.	Revision
HRT-PHP-	01-	XX-	DR-	A-	4432-	016-	P08

Scale@ A1 1:2000
0 50m 100m

OS NORTH

Field 1

Field 2

Field 3

Field 4

Field 5

Field 5

Area 6

KSM

KCM

CB

CB

Blisworth Clay

OX

Stone Pits

KEY

Site Boundary (approximate)

NOTES

1. All dimensions are to be checked on site before the commencement of works. Any discrepancies are to be reported to the Architect & Engineer for verification. Figured dimensions only are to be taken from this drawing.

2. This drawing is to be read in conjunction with all relevant Engineers' and Service Engineers' drawings and specifications.

3. This drawing has been based on the following drawings and information:

3. This drawing has been based on the Stafsurv Drawing. 'Huntingdon Road, Thrapston. Topographic Survey'. Ref: 11521a-0, dated 10/03/21.

P03	CLIENT NAME DETAILED					
	NT	15/12/21	AB	15/12/21	AB	15/12/21
P02	SITE BOUNDARY UPDATED					
	SD	08/11/21	NT	08/11/21	AB	08/11/21
P01	FIRST ISSUE					
	NT	10/08/21	AB	10/08/21	AB	10/08/21
REV.	REVISION NOTES/COMMENTS					
	DRAWN BY	DATE	CHECKED BY	DATE	APPROVED BY	DATE

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CLIENT

EQUITES NEWLANDS (THRAPSTON EAST) LTD

PROJECT

LAND ADJACENT TO HALDEN PARKWAY, THRAPSTON

TITLE

SITE SURVEY PLAN

HYDROCK PROJECT NO.	SCALE @ A0
C-18443	1:1500
PURPOSE OF ISSUE	STATUS
SUITABLE FOR INFORMATION	S2
DRAWING NO. (PROJECT CODE-ORIGINATOR-ZONE-LEVEL-TYPE-ROLE-NUMBER)	REVISION
18443-HYD-XX-ZZ-DR-GE-1002	P03

OS NORTH

Materials storage area

Field 2 (crops)

Field 3 (crops)

Drainage ditch heading northeast towards Thorpe Brook

Drainage ditch

Settlement ponds (Backfills)

Drainage ditch

Field 1 (grass)

KSM

Quarry/landfill

CB

KCM

Blisworth Clay

CB

Site entrance

Site entrance

Field 4 (crops)

OX

Concrete access track

Field 5 (crops)

Chicken barn (ACM roof)

Area 6 (grass)

Overhead High Voltage cables

AST

Pond

Farm buildings (offsite)

Residential property

Gravel track

Field 5 (crops)

AST (plastic)

Stone Pits

KEY

- Site Boundary (approximate)
- Landfill (approximate)
- Higher levels / Slope of contours / Lower levels
- Drainage ditch (direction of flow)
- Old Stone Pits (approximate) Historical 1885

NOTES

1. All dimensions are to be checked on site before the commencement of works. Any discrepancies are to be reported to the Architect & Engineer for verification. Figured dimensions only are to be taken from this drawing.
2. This drawing is to be read in conjunction with all relevant Engineers' and Service Engineers' drawings and specifications.
3. This drawing has been based on the following drawings and information:
3. This drawing has been based on the Stafsurv Drawing. 'Huntingdon Road, Thrapston. Topographic Survey'. Ref: 11521a-0, dated 10/03/21.

REV						
P03	CLIENT UPDATED	NT	15/12/21	AB	15/12/21	AB	15/12/21
P02	SITE BOUNDARY UPDATED	SD	08/11/21	NT	08/11/21	AB	08/11/21
P01	FIRST ISSUE	SD	16/08/21	NT	16/08/21	AB	16/08/21
REV.	REVISION NOTES/COMMENTS	DRAWN BY	DATE	CHECKED BY	DATE	APPROVED BY	DATE

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CLIENT: EQUITES NEWLANDS (THRPASTON EAST) LTD

PROJECT: LAND ADJACENT TO HALDEN PARKWAY, THRAPSTON

TITLE: SITE FEATURES PLAN

HYDROCK PROJECT NO.: C-18443

SCALE @ A0: 1:1500

PURPOSE OF ISSUE: SUITABLE FOR INFORMATION

STATUS: S2

DRAWING NO. (PROJECT CODE-ORIGINATOR-ZONE-LEVEL-TYPE-ROLE-NUMBER): 18443-HYD-XX-ZZ-DR-GE-1003

REVISION: P03

501600

502000

502400

278800

278800

Area 4

Area 5

Area 3

Area 2

278400

278400

Area 1

MSTL977 - Land east of Thrapston, Northamptonshire
Figure 3 - Magnetic Total Field (Lower Sensor) Overview (North)
1:3,000 @ A3

48,998 nT 49,003

A14

A14

N

0 50 100 150 m

magnitude surveys

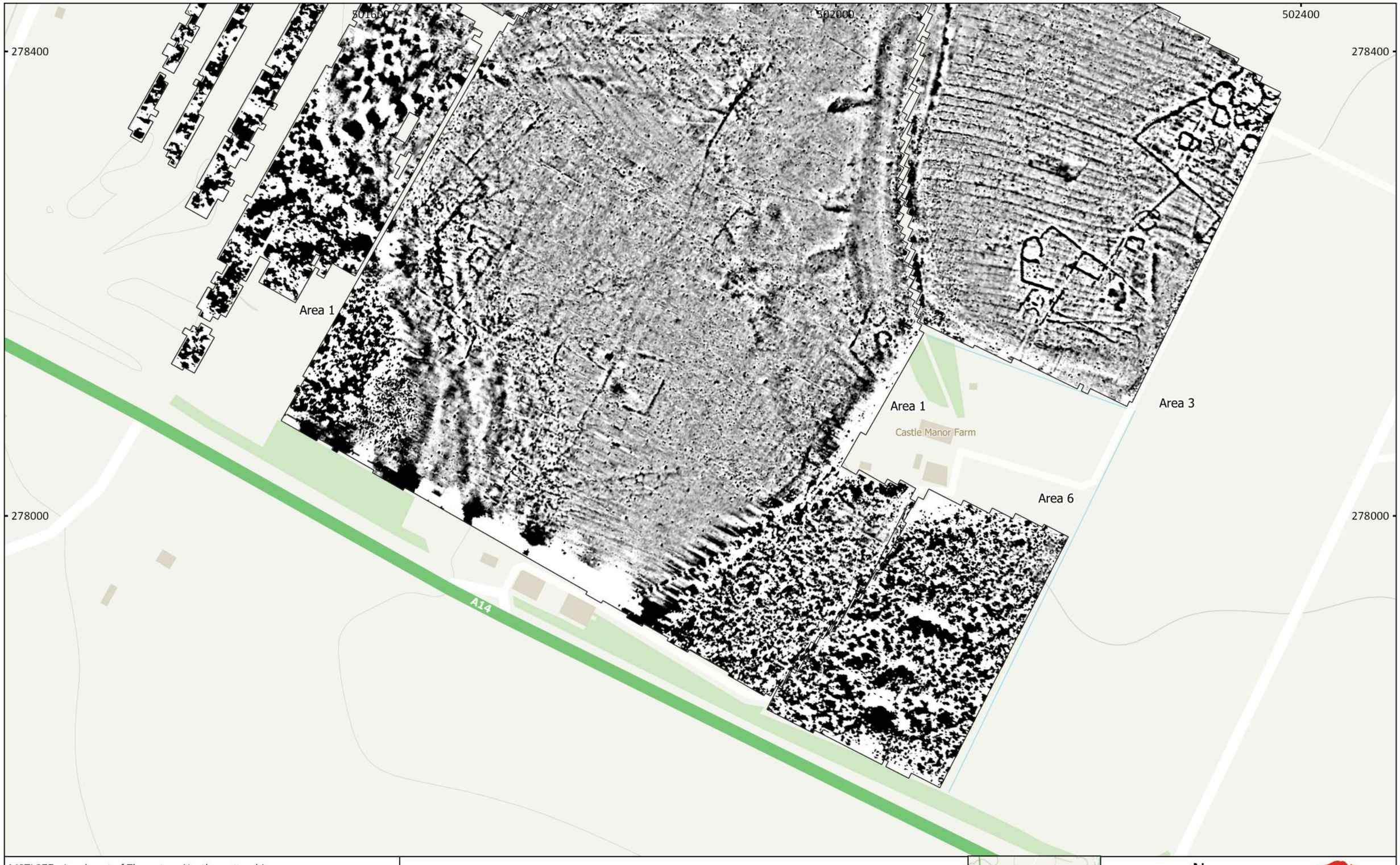
501600
502000
502400
278800
278400
Area 1
Area 2
Area 3
Area 4
Area 5
MSTL977 - Land east of Thrapston, Northamptonshire
Figure 4 - Magnetic Interpretation Over Historical Maps and Satellite Imagery Overview (North)
1:3,000 @ A3

Contains historical maps: Ordnance Survey, 6" 2nd edition c. 1882-1913.

Archaeology Probable (Strong)
Archaeology Probable (Weak)
Archaeology Probable (Zone)
Archaeology Possible (Strong)
Archaeology Possible (Weak)
Archaeology Possible (Spread)
Agricultural (Strong)
Agricultural (Weak)
Agricultural (Spread)
Industrial/Modern
Industrial/Modern (Spread)
Natural (Strong)
Natural (Weak)
Natural (Zone)
Undetermined (Strong)
Undetermined (Weak)
Magnetic Disturbance
Ferrous/Debris (Spread)
Ridge and Furrow (Trend)
Agricultural (Trend)
Drainage Feature
Service
A14
A14
N
0
50
100
150 m
magnitude surveys

501600
502000
502400
278800
278400
Area 1
Area 2
Area 3
Area 4
Area 5
MSTL977 - Land east of Thrapston, Northamptonshire
Figure 5 - Magnetic Interpretation Over LiDAR (Composite 1m DTM) Overview (North)
1:3,000 @ A3

Archaeology Probable (Strong)
Archaeology Probable (Weak)
Archaeology Probable (Zone)
Archaeology Possible (Strong)
Archaeology Possible (Weak)
Archaeology Possible (Spread)
Agricultural (Strong)
Agricultural (Weak)
Agricultural (Spread)
Industrial/Modern
Industrial/Modern (Spread)
Natural (Strong)
Natural (Weak)
Natural (Zone)
Undetermined (Strong)
Undetermined (Weak)
Magnetic Disturbance
Ferrous/Debris (Spread)
Ridge and Furrow (Trend)
Agricultural (Trend)
Drainage Feature
Service
A14
A14
N
0
50
100
150 m
magnitude surveys



MSTL977 - Land east of Thrapston, Northamptonshire
Figure 6 - Magnetic Total Field (Lower Sensor) Overview (South)
1:3,000 @ A3

48,998 nT 49,003

N

0 50 100 150 m

magnitude surveys

501600
502000
502400
278400
278000
Area 1
Area 1
Area 3
Area 6
Rectory Farm
B.M. 161·8
B.M. 199·2
181
171
M.S
Thrapston 2
Huntingdon 15

MSTL977 - Land east of Thrapston, Northamptonshire
Figure 7 - Magnetic Interpretation Over Historical Maps and Satellite Imagery Overview (South)
1:3,000 @ A3

Contains historical maps: Ordnance Survey, 6" 2nd edition c. 1882-1913.

- Archaeology Probable (Strong)
- Archaeology Probable (Weak)
- Archaeology Probable (Zone)
- Archaeology Possible (Strong)
- Archaeology Possible (Weak)
- Archaeology Possible (Spread)
- Agricultural (Strong)
- Agricultural (Weak)
- Agricultural (Spread)
- Industrial/Modern
- Industrial/Modern (Spread)
- Natural (Strong)
- Natural (Weak)
- Natural (Zone)
- Undetermined (Strong)
- Magnetic Disturbance
- Ferrous/Debris (Spread)
- Ridge and Furrow (Trend)
- Agricultural (Trend)
- Service

A14
A14

N
0 50 100 150 m
magnitude surveys

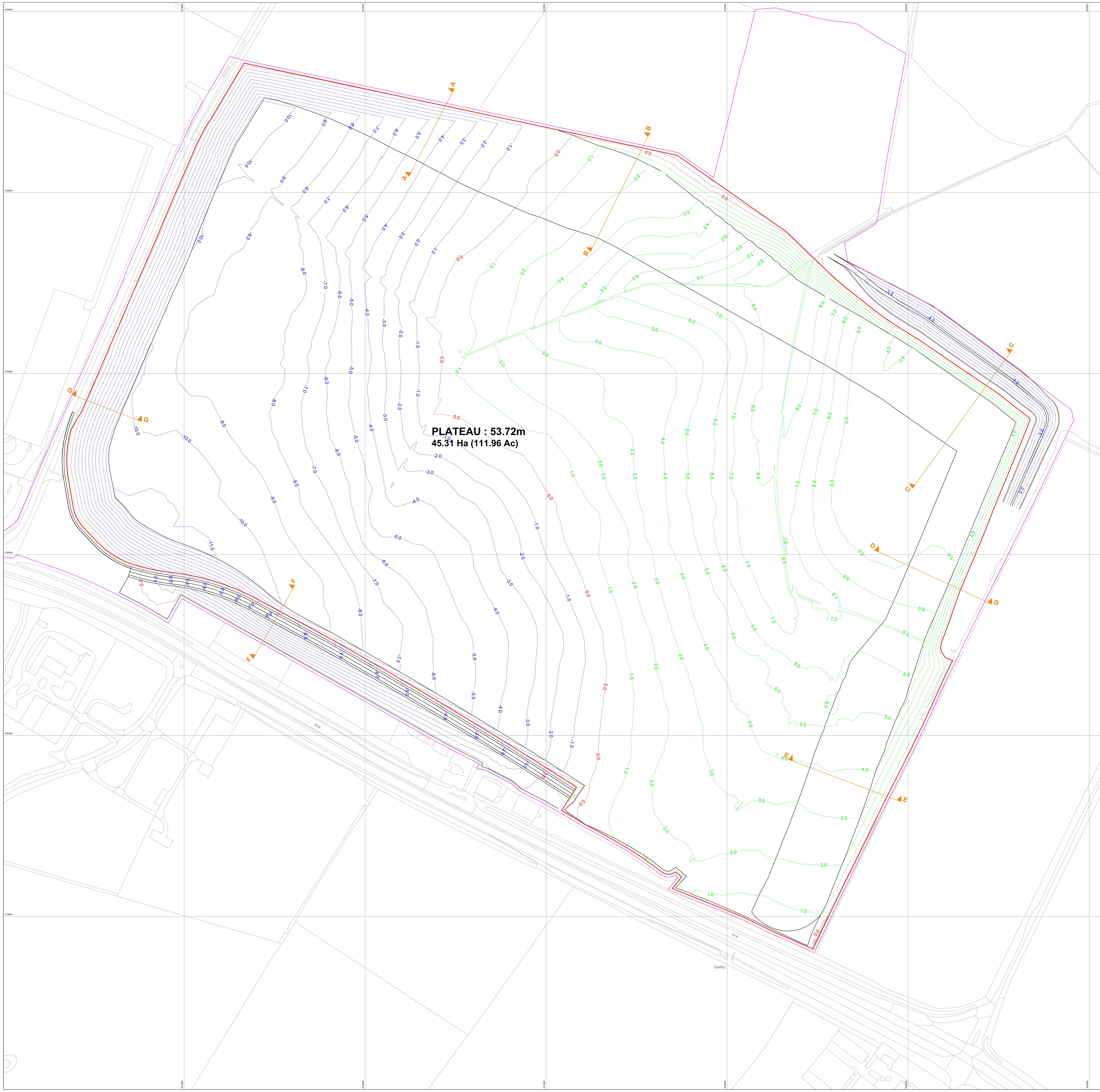
501600
502000
502400
278400
278000
Area 1
Area 1
Area 3
Area 6

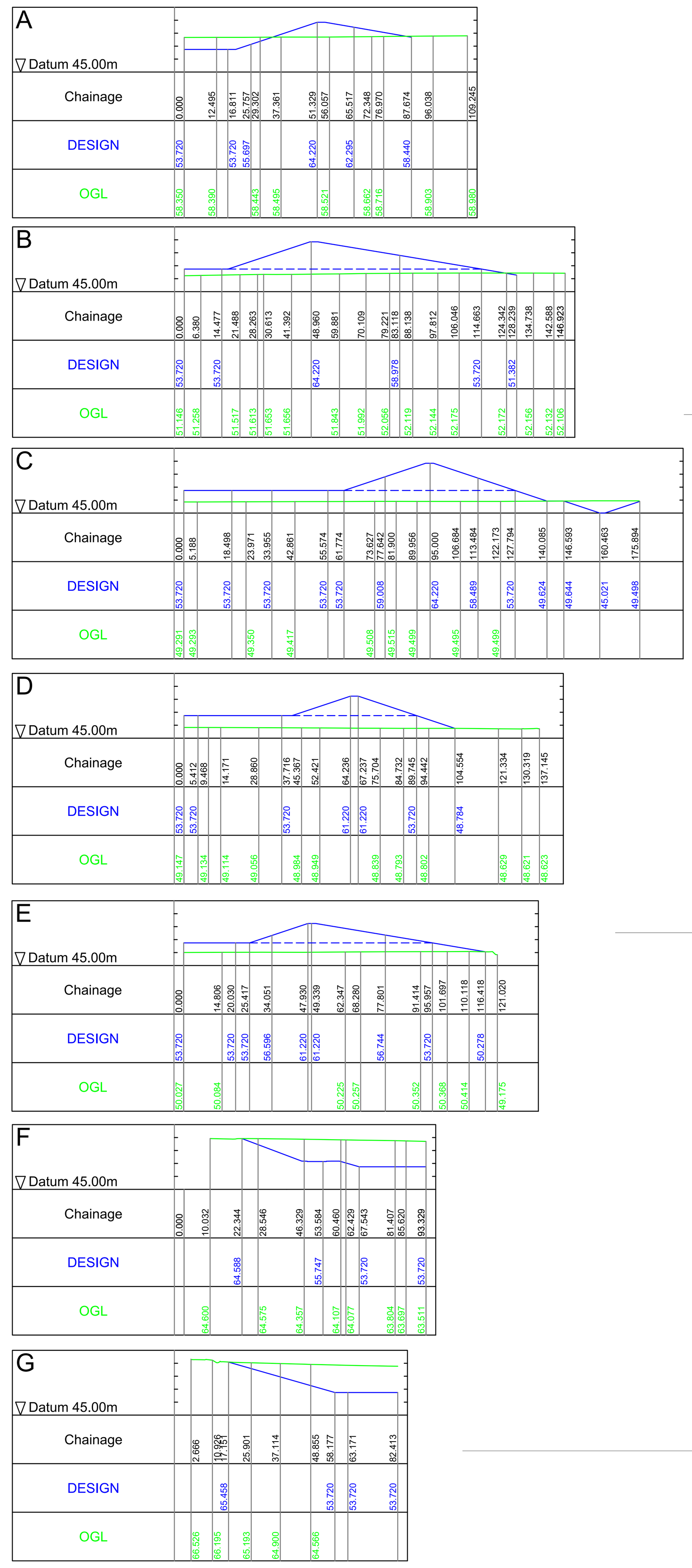
MSTL977 - Land east of Thrapston, Northamptonshire
Figure 8 - Magnetic Interpretation Over LiDAR (Composite 1m DTM) Overview (South)
1:3,000 @ A3

- Archaeology Probable (Strong)
- Archaeology Probable (Weak)
- Archaeology Probable (Zone)
- Archaeology Possible (Strong)
- Archaeology Possible (Weak)
- Archaeology Possible (Spread)
- Agricultural (Strong)
- Agricultural (Weak)
- Agricultural (Spread)
- Industrial/Modern
- Industrial/Modern (Spread)
- Natural (Strong)
- Natural (Weak)
- Natural (Zone)
- Undetermined (Strong)
- Magnetic Disturbance
- Ferrous/Debris (Spread)
- Ridge and Furrow (Trend)
- Agricultural (Trend)
- Service

A14
A14

N
0 50 100 150 m
magnitude surveys





ASSUMPTIONS :

Plateau Batters are 3m Offset from Existing Boundaries
North and East Outer Batters are at 1:6
South & West Plateau Batters are at 1:3.5
Mound & Plateau Batters Adjacent to Watercourse are at 1:3
Inner Face of Screening Mounds are at 1:3
Northern Mound is 10.5m High From Plateau Level
Eastern Mound is 7.5m High From Plateau Level

SITE STRIP :

300mm Deep Site Strip (642,751m²) **192,825m³**

EARTHWORKS :

Cut & Fill Following the Site Strip to the Plateau Level of 53.72 :

CUT	1,600,193m³
FILL	1,307,021m³
SURPLUS	**293,072m³**

SCREENING MOUNDS :

Material Required to Construct Screening Mounds		**485,897m³**
Less	Surplus From Earthworks	293,072m³
Less	Surplus From Topsoil Strip	192,825m³
OVERALL MATERIAL BALANCE		**0m³**

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NOTES

CLIENT

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SITE

HUNTINGDON ROAD
THRAPSTON

PROJECT

CUT & FILL CONTOURS
PLATEAU ONLY (NO MOUNDS)

SCALE	DATE
1:1250 @ A0	15/06/2021

DRAWING No.

11686b-0

SCHEDULE OF PARAMETERS

Development Zone	Number of Units	Maximum development floor space per Zone in m²	Minimum to Maximum finished floor level (in m above ordnance datum)	Maximum building height measured to roof ridge / highest point (in metres above ordnance datum)
Plateau Area	2 to 6	200,000	54.50 to 55.50	79.50

SUDS PONDS

BIODIVERSITY AREA

ROAD TO TITCHMARSH VILLAGE

Bridge over diverted watercourse

65.50 59.79 54.11 47.18 50.01

65.70

65.86

64.92

65.59

68.35 69.33 66.50 65.62 64.81 61.52 58.66 53.64 52.35

DHL

Depot

A14

Oak Cottage

Bottom Lodge

LEGEND

- Landscaping, Biodiversity and SUDS zone Including Earth Bunding & Batters 40.3ha / 99.68ac
- New Road and Roundabout Zone
- Development Plateau Including Plot 1 34.49ha / 85.25ac
- Farm Buildings to be Demolished to the East of the site
- Bungalow and associated buildings to the West of the site
- Area for Development Signage
- 47.18 Existing Site Levels AOD
- Bund to North and West Boundary
- Embankments to Create Buiding Plateau
- Drainage Ditch to the NE Boundary
- Plot 01 (plot layout to be approved by detailed drawings and plan
- Detailed Site and Plot 01 Access
- Existing Farm Track retained
- Re-routed Farm Track
- Existing Farm Track to be removed
- Potential Greenway Route
- Proposed on-site Permissive Route
- Potential off-site Permissive Route

Revisions:

P17	Red line amended to Titchmarsh roadway	03.11.21 RG
P18	Substation included within Plot 1 Area	16.12.21 RG
P19	Permissive routes added.	04.01.22 RG
P20	Status of drawing updated to Planning	17.01.22 RG
P21	Key updated. Farm buildings shown for clarity	31.01.22 RG
P22	Foul Pumping Station added.	03.02.22 RG

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pHp architects

HUNTINGDON ROAD THRAPSTON

PARAMETERS PLAN

Status	PLANNING
Drawn by : RG	Checked by : RM
Date	01/04/2021

Document Number:

Project Code Zone Level-Info Type Role Job No. Drg.No. Revision

HRT-PHP-01-XX-DR-A-4432-014-P22

Scale@ A1 1:2000

0 50m 100m

Areas Schedule									Parking and docks - figures quoted are minimum, plots may allow additional.						Plot Areas
Plot No.	Warehouse GIA SQFT	Warehouse GIA SQM	Offices GIA SQFT	Offices GIA SQM	Hub Office SQFT	Hub Office SQM	Total GIA SQFT	Total GIA SQM	Car Parking @1/120sqm	HGV Parking	Docks	Level Access	cycles	PTW's	Plot Areas
1	500000	46451	25000	2323	10000	929	535000	49704	414	142	68	8	100	16	11.061 ha / 27.09 acres
2	360000	33445	15000	1394	5000	465	380000	35304	294	85	48	8	70	12	8.145 ha / 20.13 acres
3	594000	55184	25000	2323	10000	929	629000	58436	487	201	72	8	117	18	13.130 ha / 32.44 acres
4	550000	51097	25000	2323	10000	929	585000	54348	454	202	72	8	109	17	13.043 ha / 32.23acres
Total	2,004,000	186,177	90,000	8,363	35,000	3,252	2,129,000	197,790	1649	630	260	32	396	63	

Revisions:

P14	Permissive Routes added	04.01.22 RG
P15	Update to correct parking no. discrepancy	06.01.22 RG
P16	Status updated to Planning	17.01.22 RG
P17	Minor correction to rounding within Areas stated	31.01.22 RG
P18	Foul Pumping Station added.	03.02.22 RG

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HUNTINGDON ROAD THRAPSTON

INDICATIVE MASTERPLAN AND PLOT 1 DETAILS

Status	PLANNING
Drawn by : RG	Checked by : RM
Date	01/04/2021

Document Number:

Project Code Zone Level-Info Type Role Job No. Drg No. Revison

HRT-PHP-01-XX-DR-A-4432-012-P18

Scale@ A1 1:2000

0 50m 100m

OVERALL RED LINE AREA
74.83 ha / 184.90 acres

PLOT 1 BOUNDARY

Legend:
Outline Application Red Line
Detailed Plot 1 Application Red Line

Revisions:

P03	Additional land for biodiversity added	27.10.21 RM
P04	Red line amended to Titchmarsh roadway	03.11.21 RG
P05	Substation included within Plot 1 Area	16.12.21 RG
P06	Red line to Plot 1 updated	04.01.22 RG
P07	Status of drawing updated to Planning	11.01.22 RG
P08	Road names & Legend added	31.01.22 RG

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HUNTINGDON ROAD
THRAPSTON

LOCATION PLAN

Status	PLANNING
Drawn by : RG	Checked by : RM
Date	01/04/2021

Document Number:

Project Code	Zone	Level-Info	Type	Role	Job No.	Drg.No.	Revision
HRT-PHP-	01-	XX-	DR-	A-	4432-	016-	P08

Scale@ A1 1:2000
0 50m 100m

Appendix B Field Reconnaissance Photographs

Desk Study Photograph 1	
Date: 02/06/2021	
Direction Photograph Taken: North	
Description: Brick building in Farm Complex.	

Desk Study Photograph 2	
Date: 02/06/2021	
Direction Photograph Taken: Looking south	
Description: Track to the south of Farm Complex.	

Desk Study Photograph 3	
Date: 02/06/2021	
Direction Photograph Taken: Looking southeast	
Description: Cropped fields towards former Old Stone Pit	

Desk Study Photograph 4	
Date: 02/06/2021	
Direction Photograph Taken: Looking east southwest	
Description: Cropped field	

Desk Study Photograph 5	
Date: 02/06/2021	
Direction Photograph Taken: North	
Description: Farm buildings with AST in background	

Desk Study Photograph 6	
Date: 02/06/2021	
Direction Photograph Taken: West	
Description: Internal of farm buildings.	

Desk Study Photograph 7	
Date: 02/06/2021	
Direction Photograph Taken: East	
Description: Pond in foreground and grassed fields beyond.	

Desk Study Photograph 8	
Date: 02/06/2021	
Direction Photograph Taken: West.	
Description: Farm complex.	

Desk Study Photograph 9	
Date: 02/06/2021	
Direction Photograph Taken: North	
Description: Above ground UST in centre of farm complex.	

Desk Study Photograph 10	
Date: 02/06/2021	
Direction Photograph Taken: South	
Description: Grass field with residential property beyond in Farm Complex.	

Desk Study Photograph 11	
Date: 02/06/2021	
Direction Photograph Taken: Northeast	
Description: Grassed field as part of the farm complex.	

Desk Study Photograph 12	
Date: 02/06/2021	
Direction Photograph Taken: North.	
Description: Former chicken coop with suspected asbestos cement sheeting.	

Desk Study Photograph 13	
Date: 02/06/2021	
Direction Photograph Taken: Southwest	
Description: Looking upslope from centre of site towards DHL.	

Desk Study Photograph 14	
Date: 02/06/2021	
Direction Photograph Taken: North	
Description: Looking downslope from centre of site towards lowest point on site.	

Desk Study Photograph 15	
Date: 02/06/2021	
Direction Photograph Taken: Southeast	
Description: Northern point of site looking towards centre of site.	

Desk Study Photograph 16	
Date: 02/06/2021	
Direction Photograph Taken: West	
Description: Southwestern corner of the site looking to wards offsite barns.	

Desk Study Photograph 17	
Date: 02/06/2021	
Direction Photograph Taken: Northwest.	
Description: Southwest corner overlying area of 'Old Stone Pits'.	

Desk Study Photograph 18	
Date: 02/06/2021	
Direction Photograph Taken: West	
Description: HV Overheads along southern boundary of the site..	

Desk Study Photograph 19	
Date: 02/06/2021	
Direction Photograph Taken: North	
Description: General overview of centre of site. Ground sloping from left to right.	

Desk Study Photograph 20	
Date: 02/06/2021	
Direction Photograph Taken: South	
Description: Barns offsite to the south.	

Desk Study Photograph 21	
Date: 02/06/2021	
Direction Photograph Taken: Northeast	
Description: Southwest corner of cropped fields looking downslope. Farm in distance.	

Desk Study Photograph 22	
Date: 02/06/2021	
Direction Photograph Taken: North	
Description: Field boundary between grassed field to west and cropped field to east.	

Desk Study Photograph 23	
Date: 02/06/2021	
Direction Photograph Taken: West	
Description: Overgrown grassed field in southwest. Sloping to northeast.	

Desk Study Photograph 24	
Date: 02/06/2021	
Direction Photograph Taken: West	
Description: Borehole monitoring point in grassed field.	

Desk Study Photograph 25	
Date: 02/06/2021	
Direction Photograph Taken: West	
Description: Gated access to grassed field.	

Desk Study Photograph 26	
Date: 02/06/2021	
Direction Photograph Taken: North	
Description: Western boundary of grassed field.	

Desk Study Photograph 27	
Date: 02/06/2021	
Direction Photograph Taken: Northeast	
Description: Overview of grassed field sloping away.	

Desk Study Photograph 28	
Date: 02/06/2021	
Direction Photograph Taken: West	
Description: Residential property and working yard offsite to the west.	

Desk Study Photograph 29	
Date: 02/06/2021	
Direction Photograph Taken: Southeast	
Description: Grassed field in the southwest from northern boundary.	

Desk Study Photograph 30	
Date: 02/06/2021	
Direction Photograph Taken: East	
Description: Overview of site from west to east across northern cropped field.	

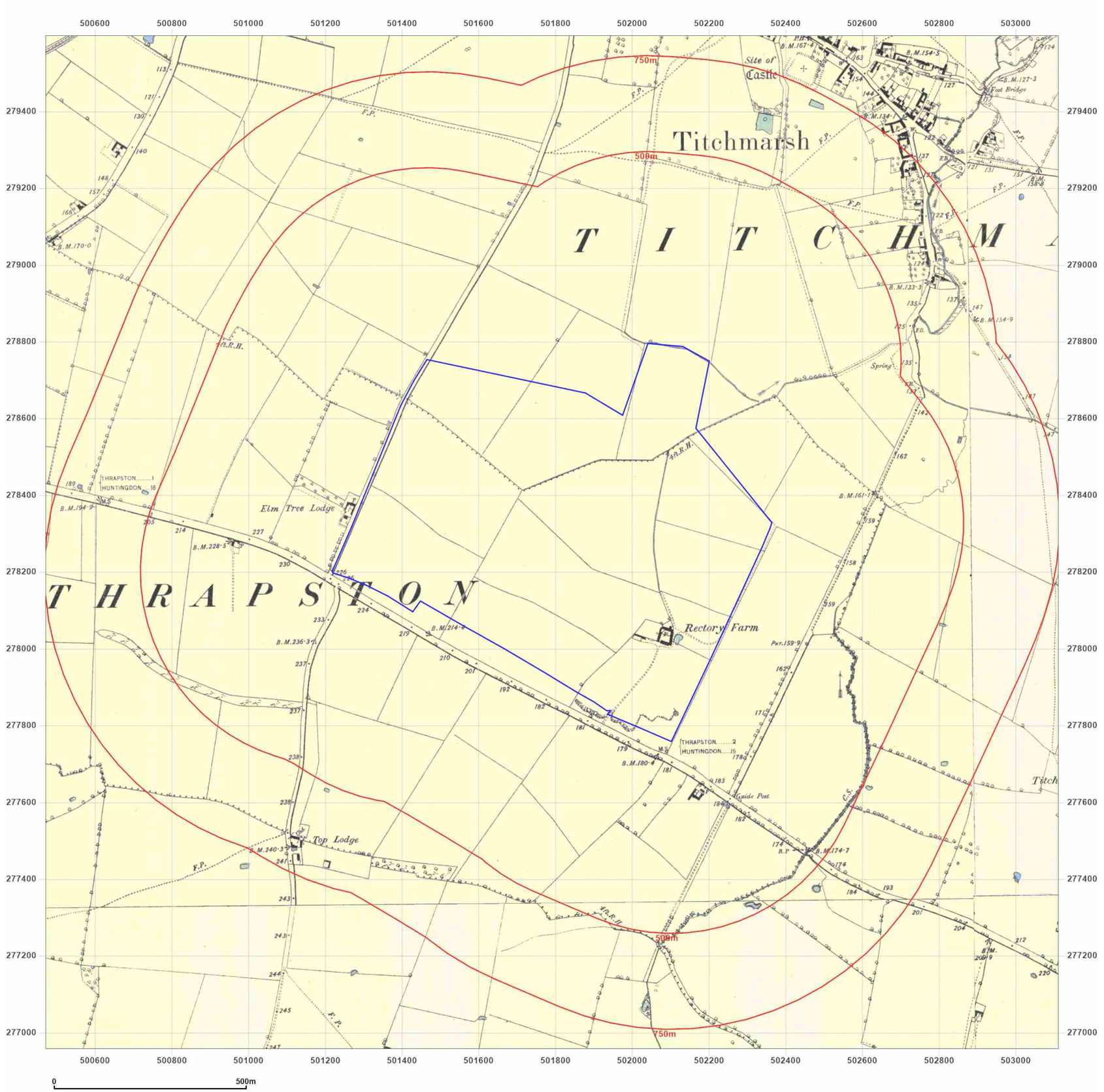
Desk Study Photograph 31	
Date: 02/06/2021	
Direction Photograph Taken: West	
Description: former settlement lagoon area.	

Desk Study Photograph 32	
Date: 02/06/2021	
Direction Photograph Taken: South	
Description: Drainage Ditch in centre of site	

Desk Study Photograph 33	
Date: 02/06/2021	
Direction Photograph Taken: West	
Description: Looking east towards eastern boundary up slope.	

Desk Study Photograph 34	
Date: 02/06/2021	
Direction Photograph Taken: North	
Description: Access Road along western boundary.	

Appendix C Historical Ordnance Survey Maps



Groundsure INSIGHTS

Site Details:

501767, 278467

Client Ref: C-18443-_Sophie_
Report Ref: GS-7926026
Grid Ref: 501790, 278277

Map Name: County Series

Map date: **1884-1885**

Scale: 1:10,560

Printed at: 1:10,560

N
W E
S

Surveyed 1885
Revised N/A
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1885
Revised N/A
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1884
Revised 1884
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1884
Revised 1884
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Groundsure INSIGHTS

Site Details:

501767, 278467

Client Ref: C-18443-_Sophie_
Report Ref: GS-7926026
Grid Ref: 501790, 278277

Map Name: County Series

Map date: **1885**

Scale: 1:10,560

Printed at: 1:10,560

N
W E
S

Surveyed 1885
Revised 1885
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1885
Revised 1885
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1884
Revised N/A
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Surveyed 1884
Revised N/A
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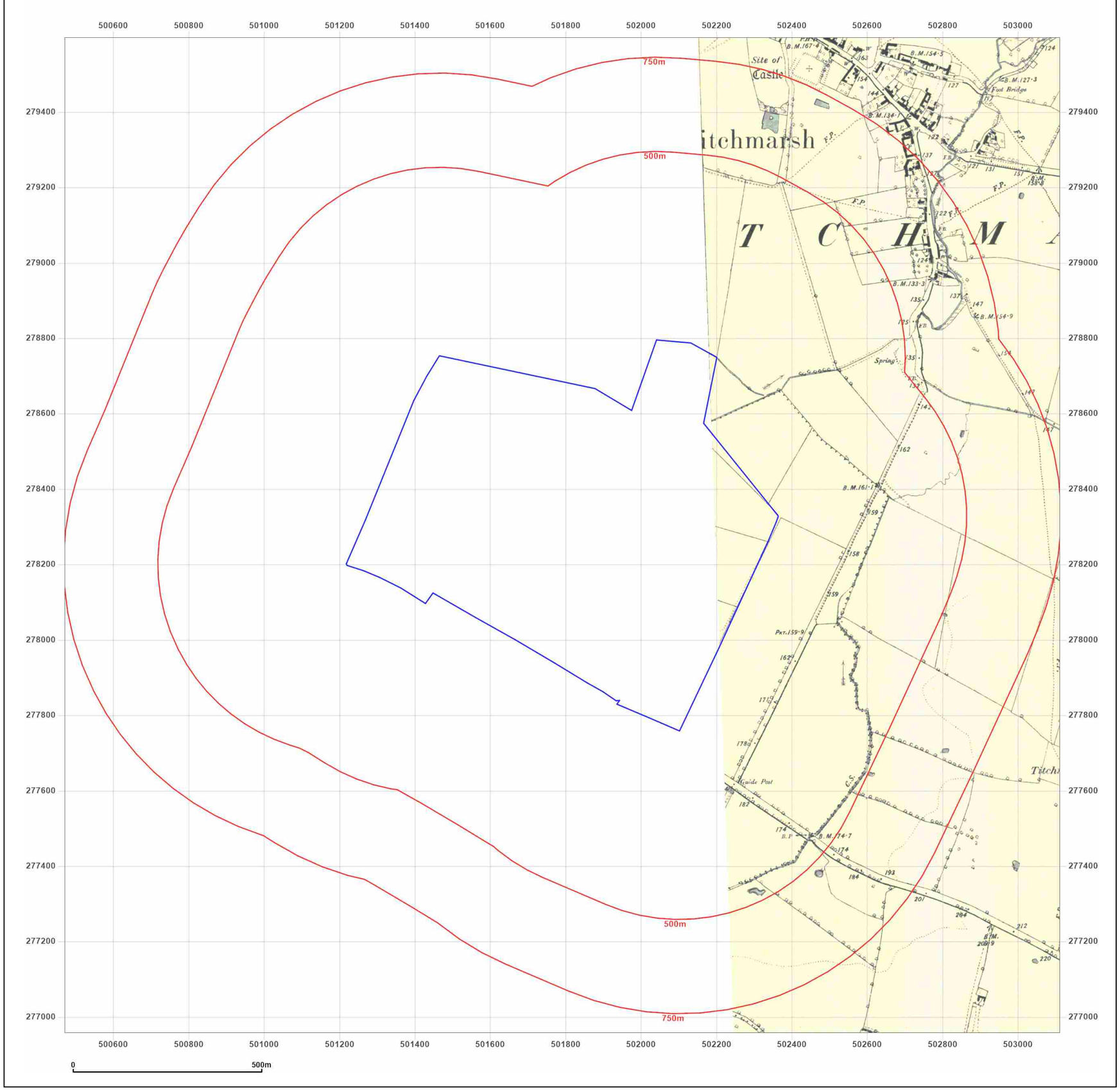


Groundsure INSIGHTS

Site Details:

501767, 278467

Client Ref: C-18443-_Sophie_
Report Ref: GS-7926026
Grid Ref: 501790, 278277

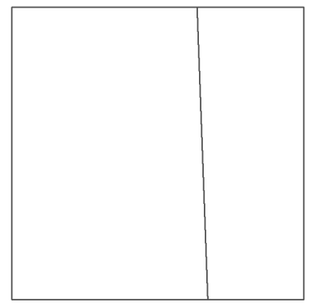
Map Name: County Series

Map date: **1887**

Scale: 1:10,560

Printed at: 1:10,560

N
W E
S



Surveyed 1887
Revised 1887
Edition N/A
Copyright N/A
Levelled N/A

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Map legend available at:
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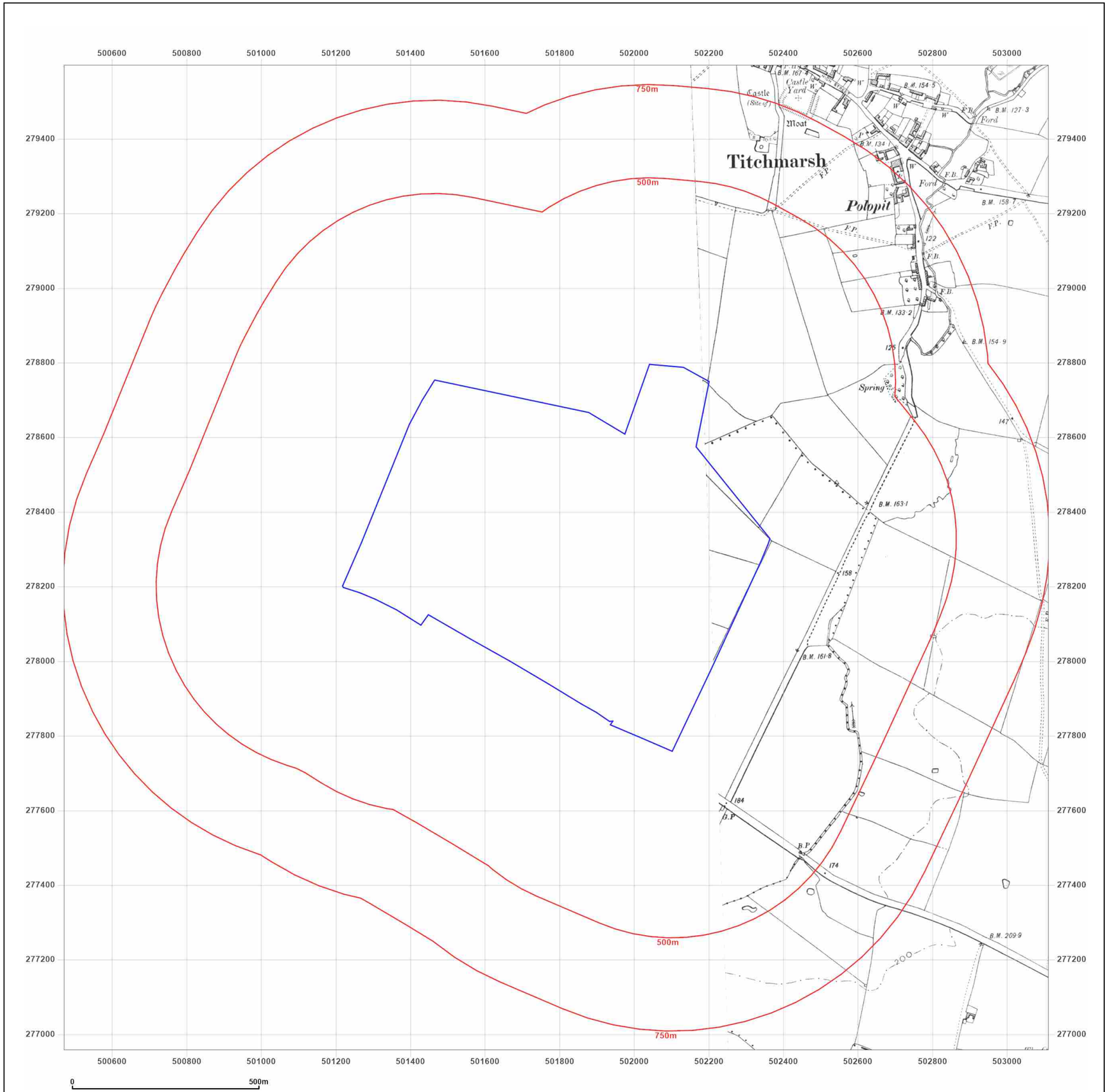

Groundsure INSIGHTS

Site Details:

501767, 278467

Client Ref: C-18443-_Sophie_
Report Ref: GS-7926026
Grid Ref: 501790, 278277

Map Name: County Series

Map date: **1899**

Scale: 1:10,560

Printed at: 1:10,560

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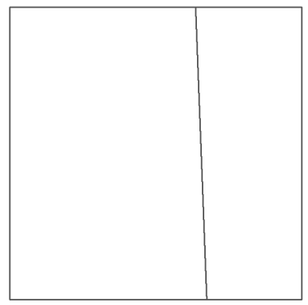

Surveyed 1887
Revised 1899
Edition N/A
Copyright N/A
Levelled N/A

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Production date: 04 June 2021

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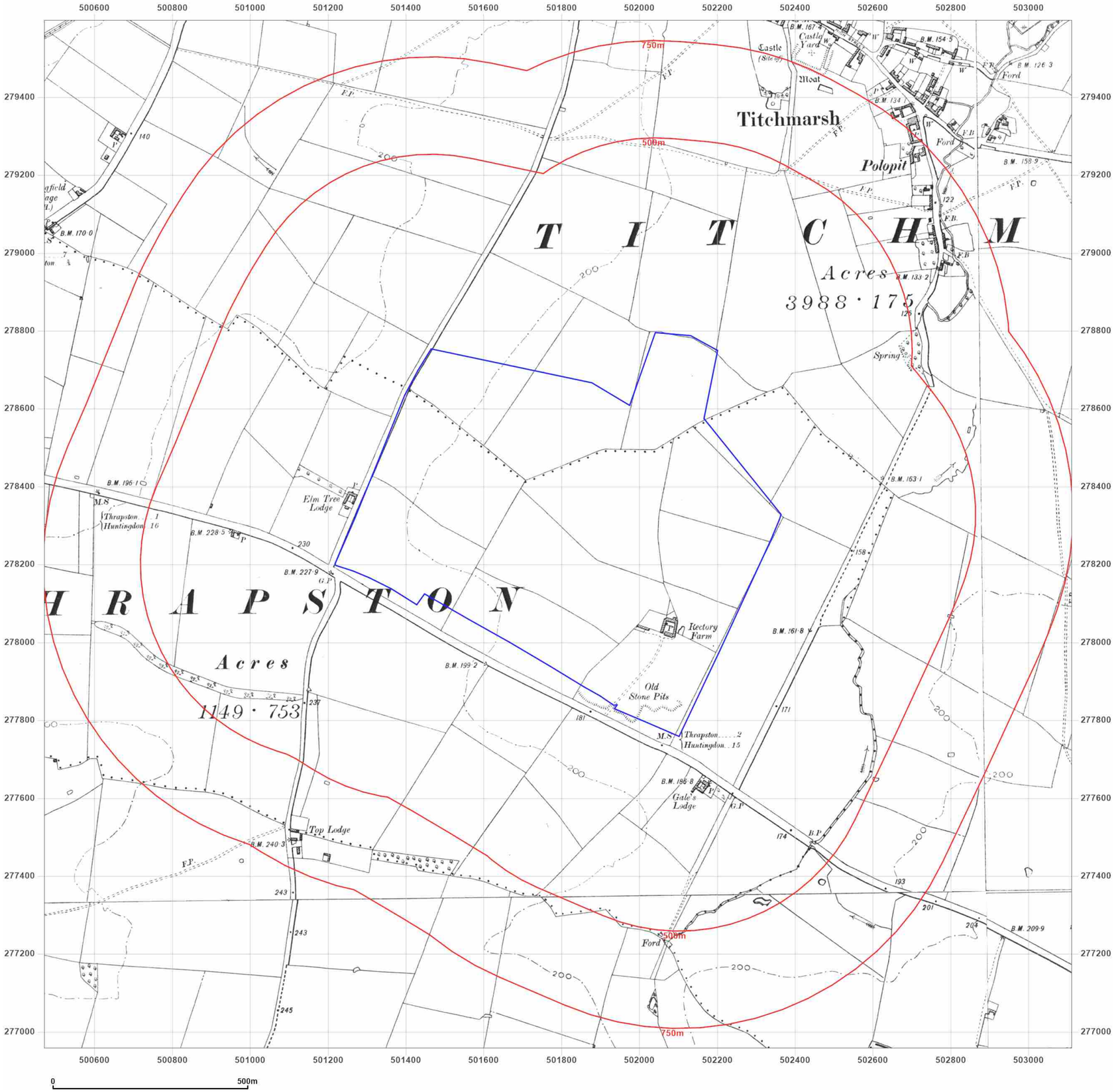

Groundsure INSIGHTS

Site Details:

501767, 278467

Client Ref: C-18443-_Sophie_
Report Ref: GS-7926026
Grid Ref: 501790, 278277

Map Name: County Series

Map date: **1899-1901**

Scale: 1:10,560

Printed at: 1:10,560

N
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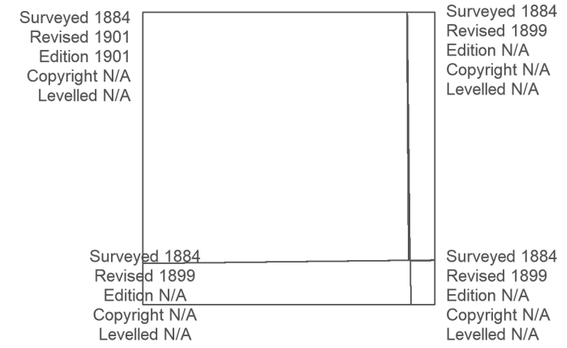

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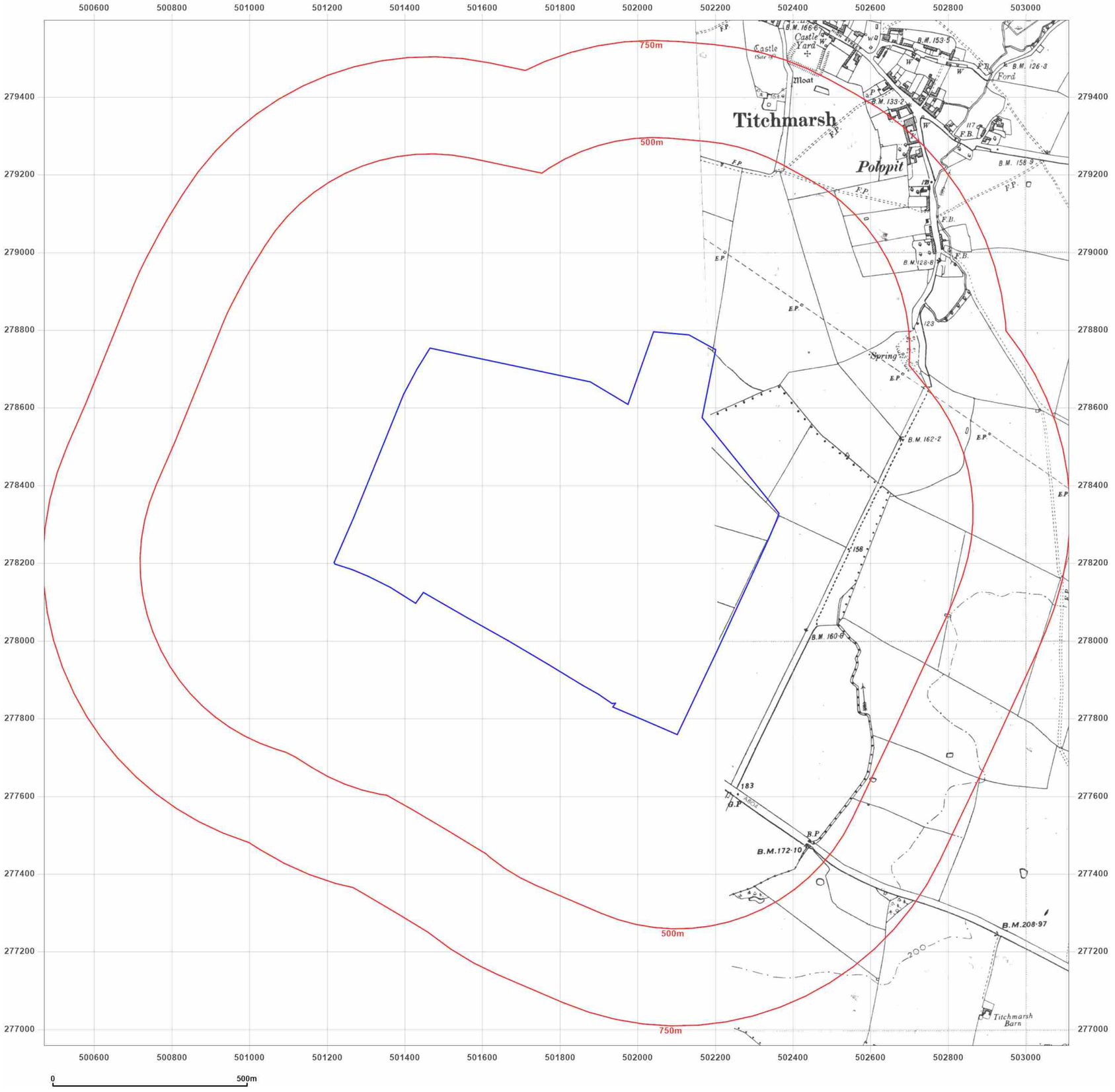

Groundsure INSIGHTS

Site Details:

501767, 278467

Client Ref: C-18443-_Sophie_
Report Ref: GS-7926026
Grid Ref: 501790, 278277

Map Name: County Series

Map date: **1950**

Scale: 1:10,560

Printed at: 1:10,560

N
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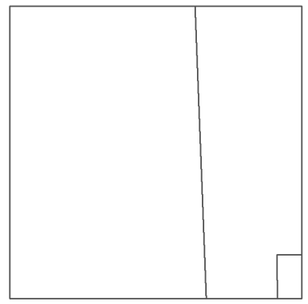

Surveyed 1887
Revised 1950
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1884
Revised 1950
Edition N/A
Copyright N/A
Levelled N/A

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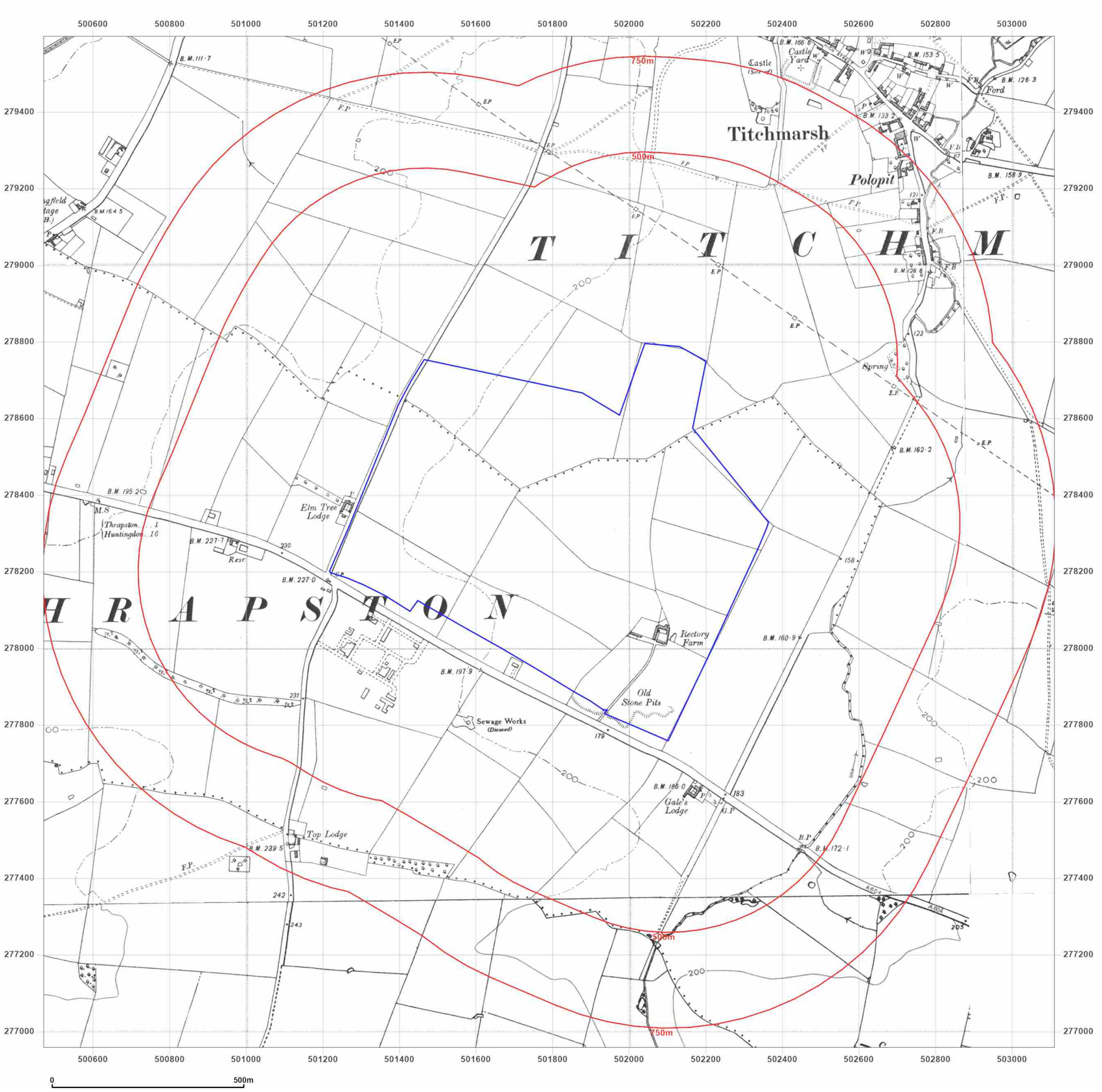

Groundsure INSIGHTS

Site Details:

501767, 278467

Client Ref: C-18443-_Sophie_
Report Ref: GS-7926026
Grid Ref: 501790, 278277

Map Name: County Series

Map date: **1950-1951**

Scale: 1:10,560

Printed at: 1:10,560

N
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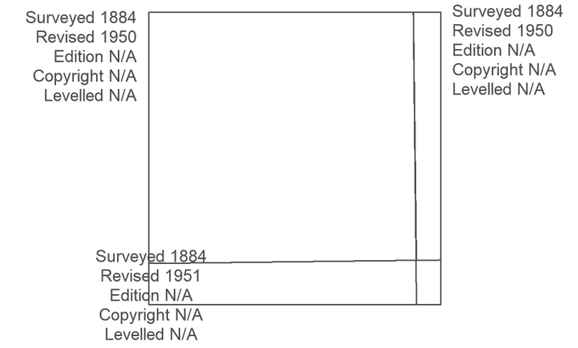

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Production date: 04 June 2021

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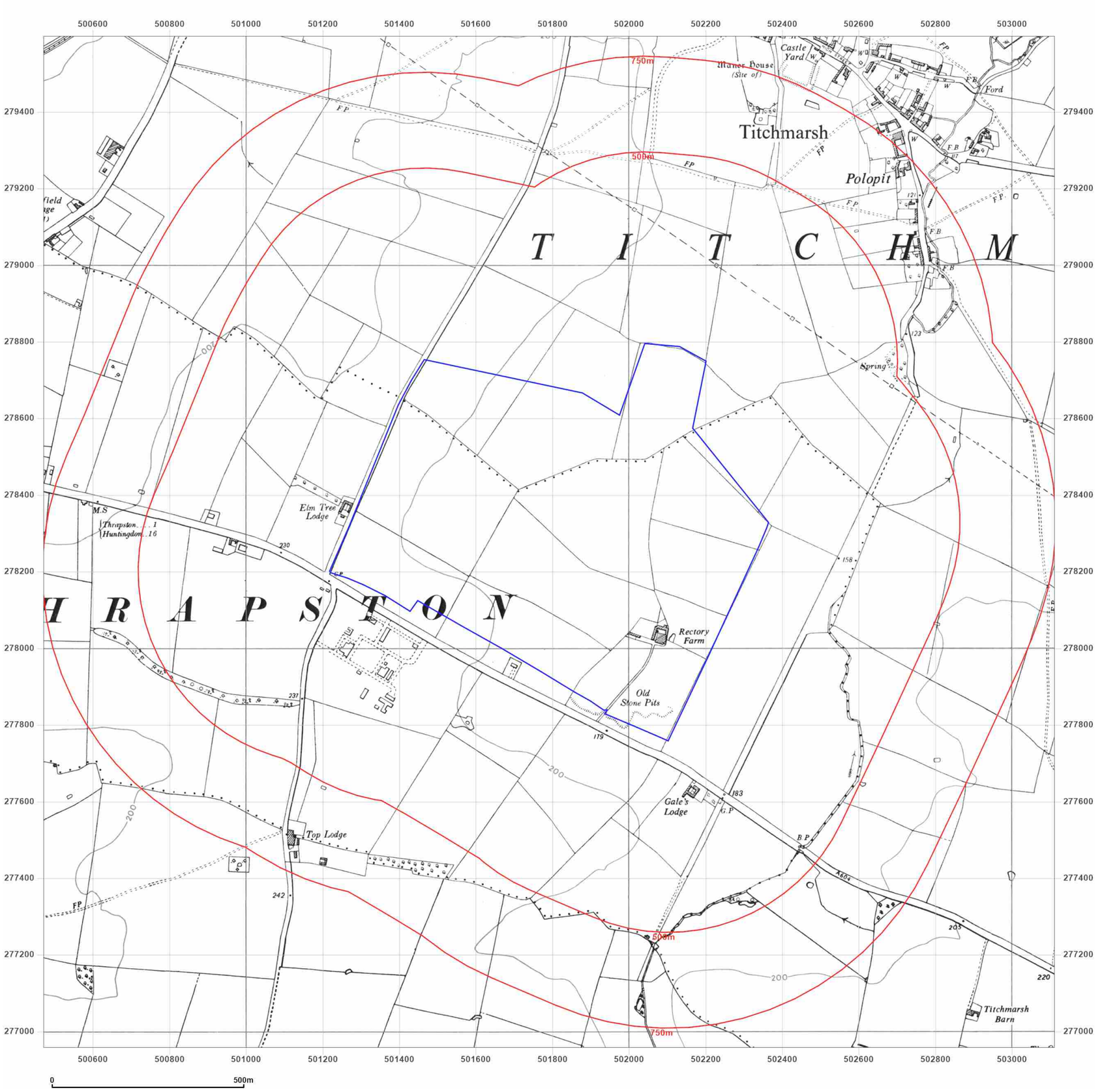

Groundsure INSIGHTS

Site Details:

501767, 278467

Client Ref: C-18443-_Sophie_
Report Ref: GS-7926026
Grid Ref: 501790, 278277

Map Name: Provisional
Map date: **1951**
Scale: 1:10,560
Printed at: 1:10,560

N
W E
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Surveyed 1951
Revised 1951
Edition N/A
Copyright N/A
Levelled N/A

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Production date: 04 June 2021

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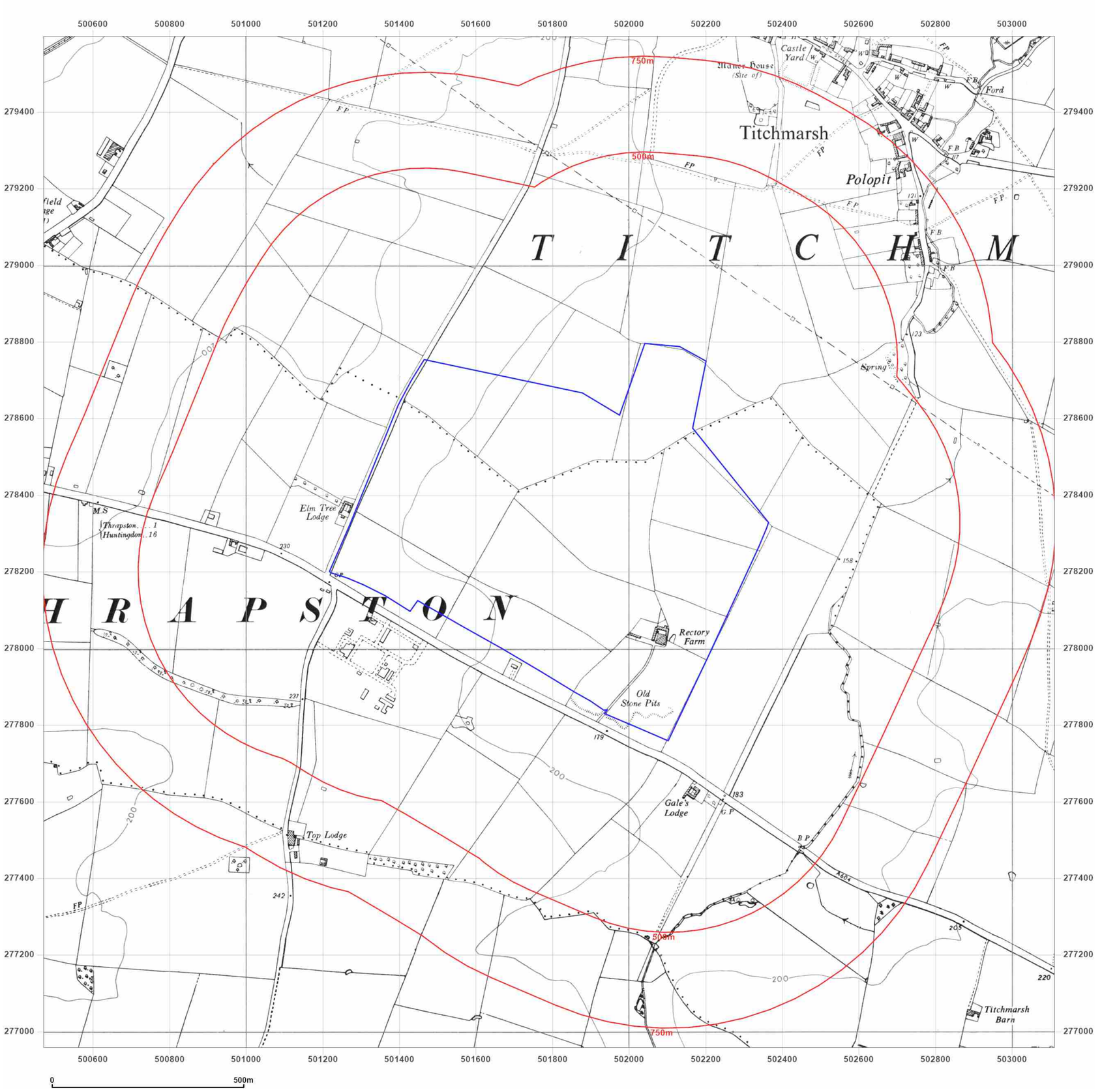

Groundsure INSIGHTS

Site Details:

501767, 278467

Client Ref: C-18443-_Sophie_
Report Ref: GS-7926026
Grid Ref: 501790, 278277

Map Name: Provisional
Map date: **1951**
Scale: 1:10,560
Printed at: 1:10,560

N
W E
S

Surveyed 1951
Revised 1951
Edition N/A
Copyright N/A
Levelled N/A

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Production date: 04 June 2021

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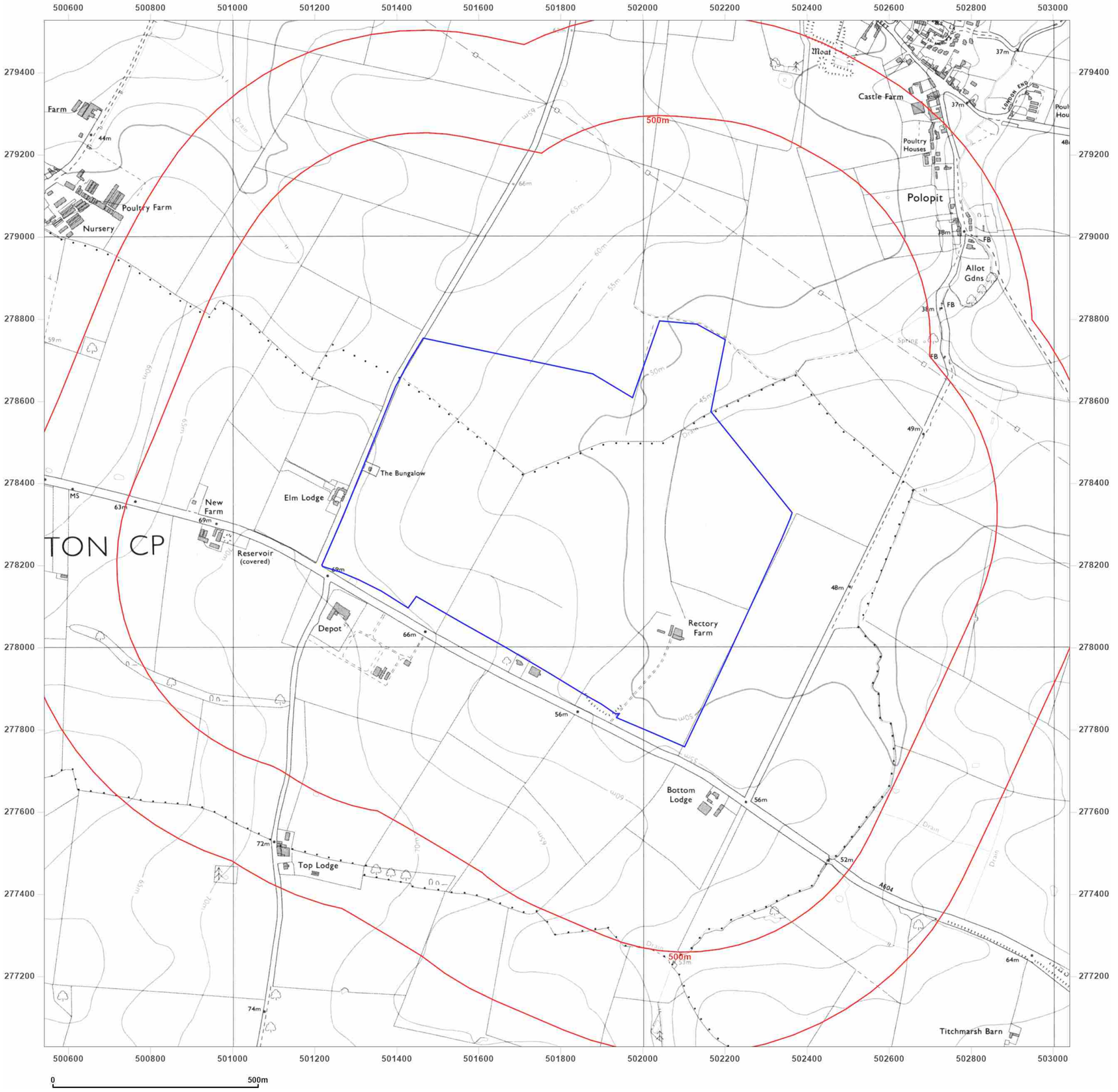

Groundsure INSIGHTS

Site Details:

501767, 278467

Client Ref: C-18443-_Sophie_
Report Ref: GS-7926026
Grid Ref: 501790, 278277

Map Name: National Grid

Map date: **1982**

Scale: 1:10,000

Printed at: 1:10,000

N
W E
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Surveyed 1974
Revised 1982
Edition N/A
Copyright N/A
Levelled N/A

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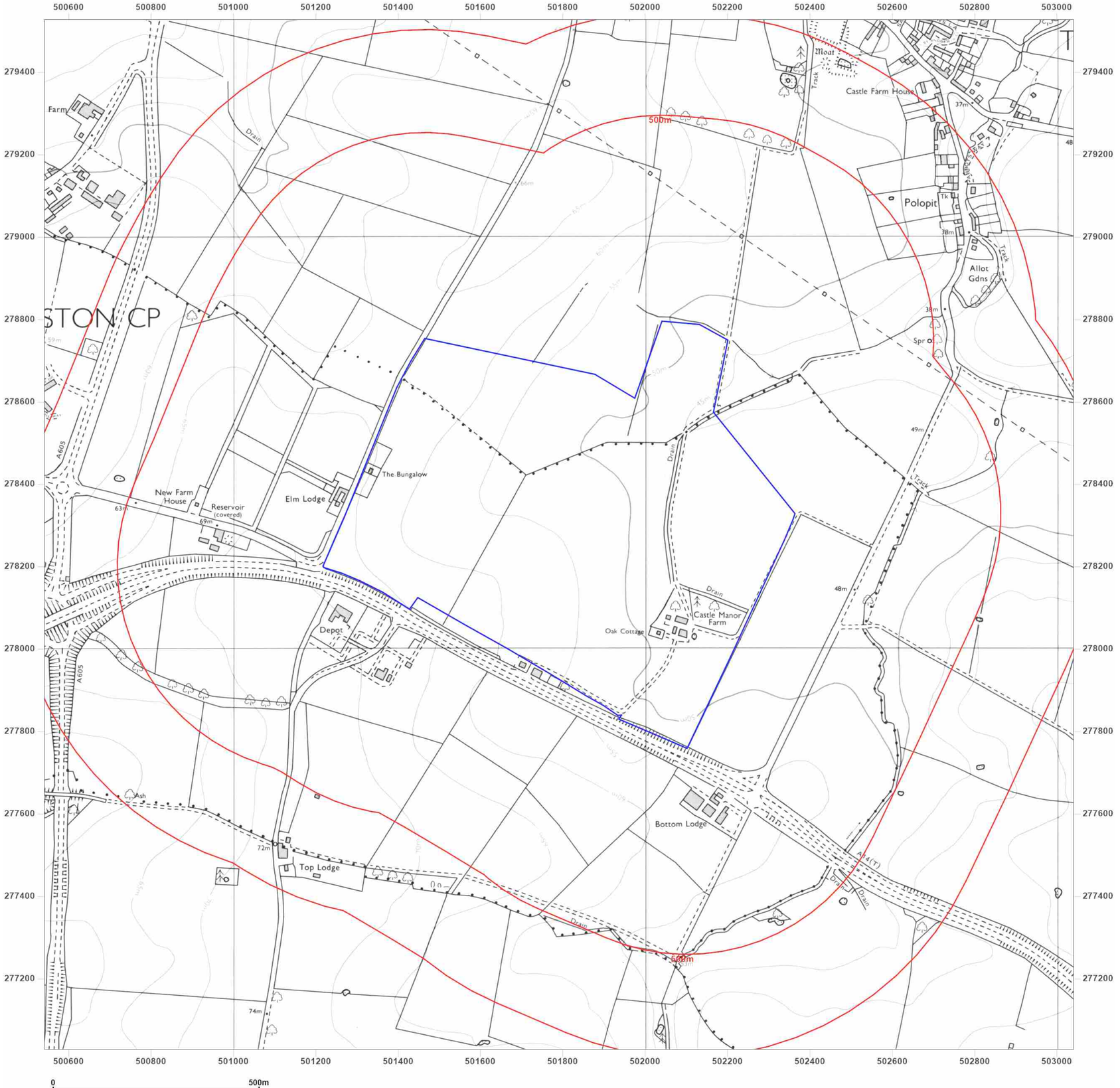

Groundsure INSIGHTS

Site Details:

501767, 278467

Client Ref: C-18443-_Sophie_
Report Ref: GS-7926026
Grid Ref: 501790, 278277

Map Name: National Grid

Map date: **1994**

Scale: 1:10,000

Printed at: 1:10,000

N
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Surveyed 1974
Revised 1994
Edition N/A
Copyright N/A
Levelled N/A

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Groundsure INSIGHTS

Site Details:

501767, 278467

Client Ref: C-18443-_Sophie_
Report Ref: GS-7926026
Grid Ref: 501790, 278277

Map Name: National Grid

Map date: **2001**

Scale: 1:10,000

Printed at: 1:10,000

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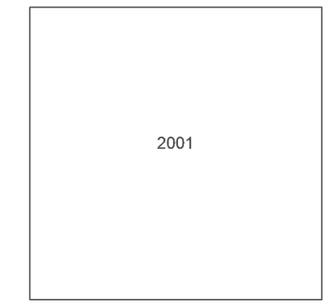

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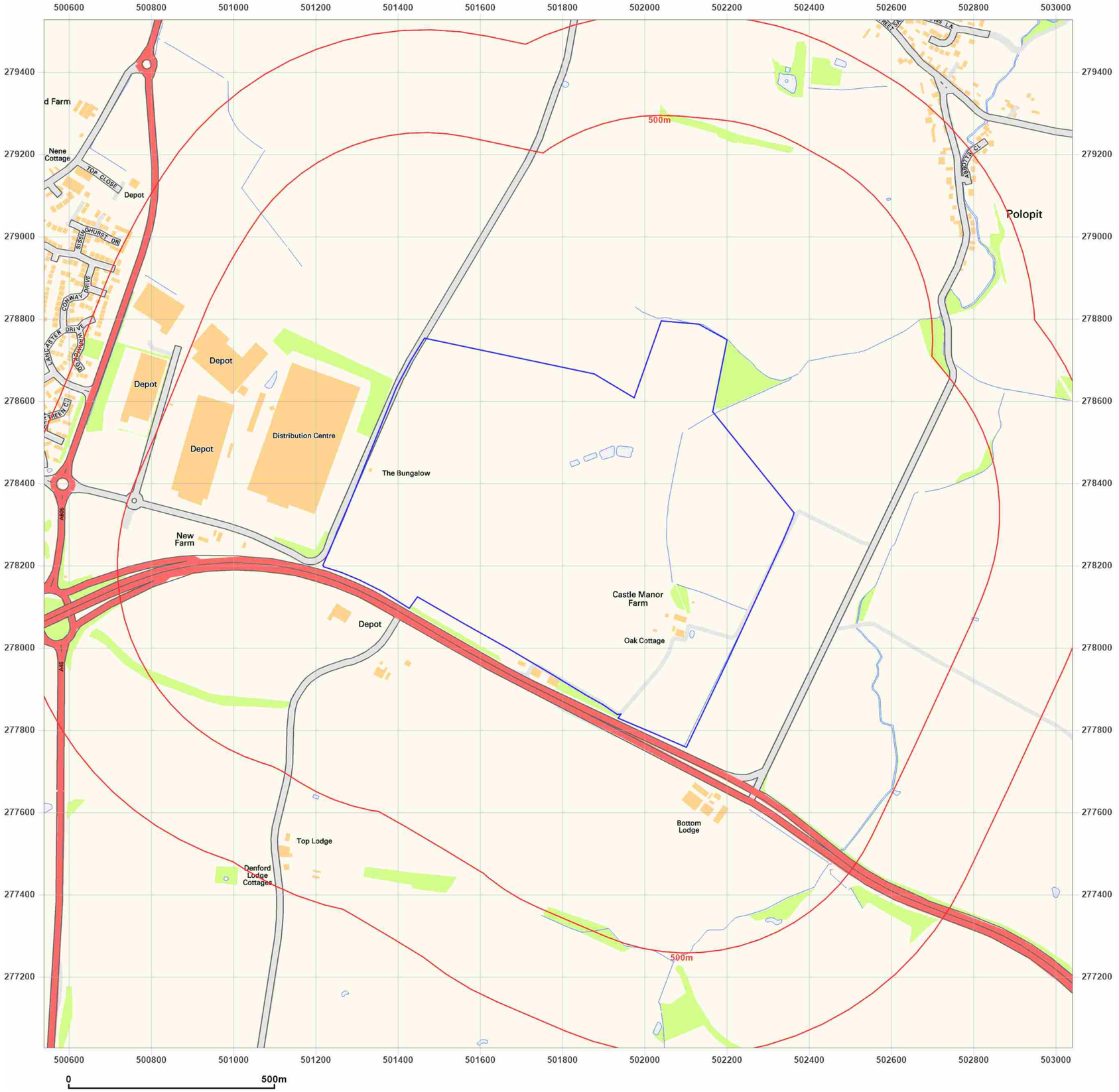

Groundsure INSIGHTS

Site Details:

501767, 278467

Client Ref: C-18443-_Sophie_
Report Ref: GS-7926026
Grid Ref: 501790, 278277

Map Name: National Grid

Map date: **2010**

Scale: 1:10,000

Printed at: 1:10,000

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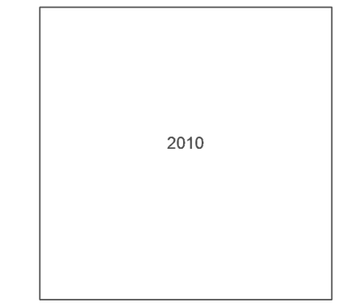

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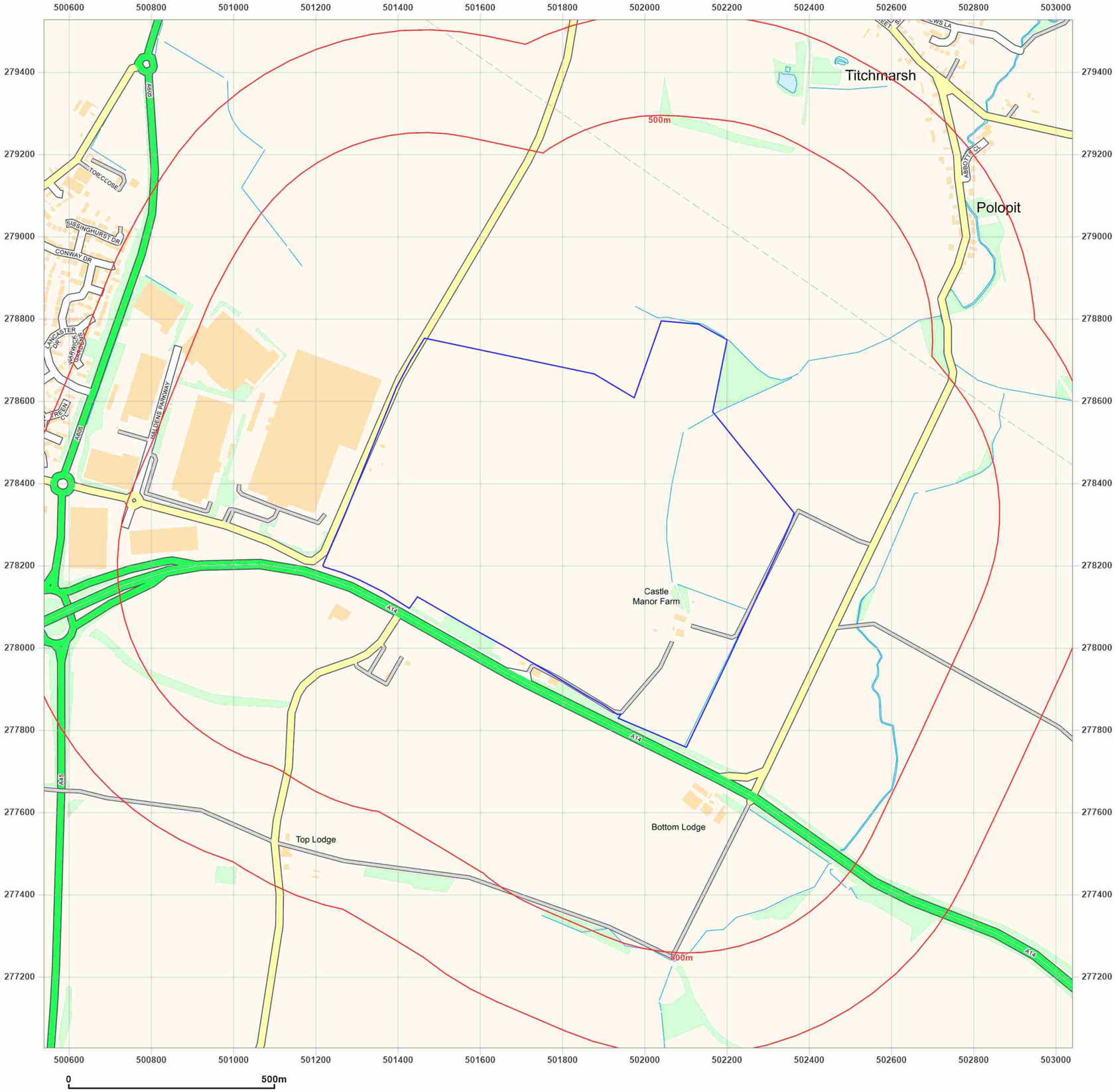

Groundsure INSIGHTS

Site Details:

501767, 278467

Client Ref: C-18443-_Sophie_
Report Ref: GS-7926026
Grid Ref: 501790, 278277

Map Name: National Grid

Map date: **2021**

Scale: 1:10,000

Printed at: 1:10,000

N
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2021

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Production date: 04 June 2021

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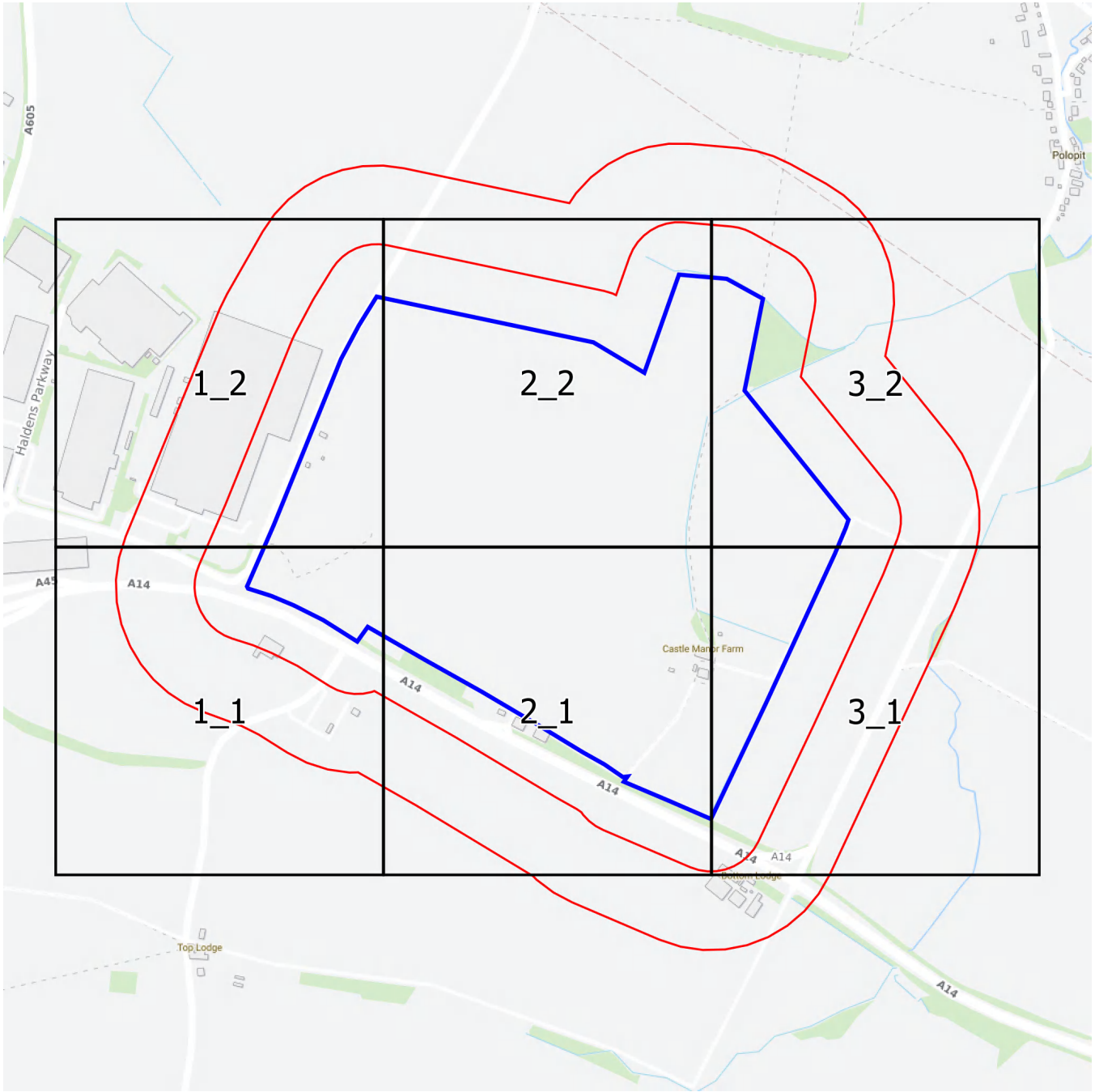

Groundsure INSIGHTS

1:2,500 Scale Grid Index

N
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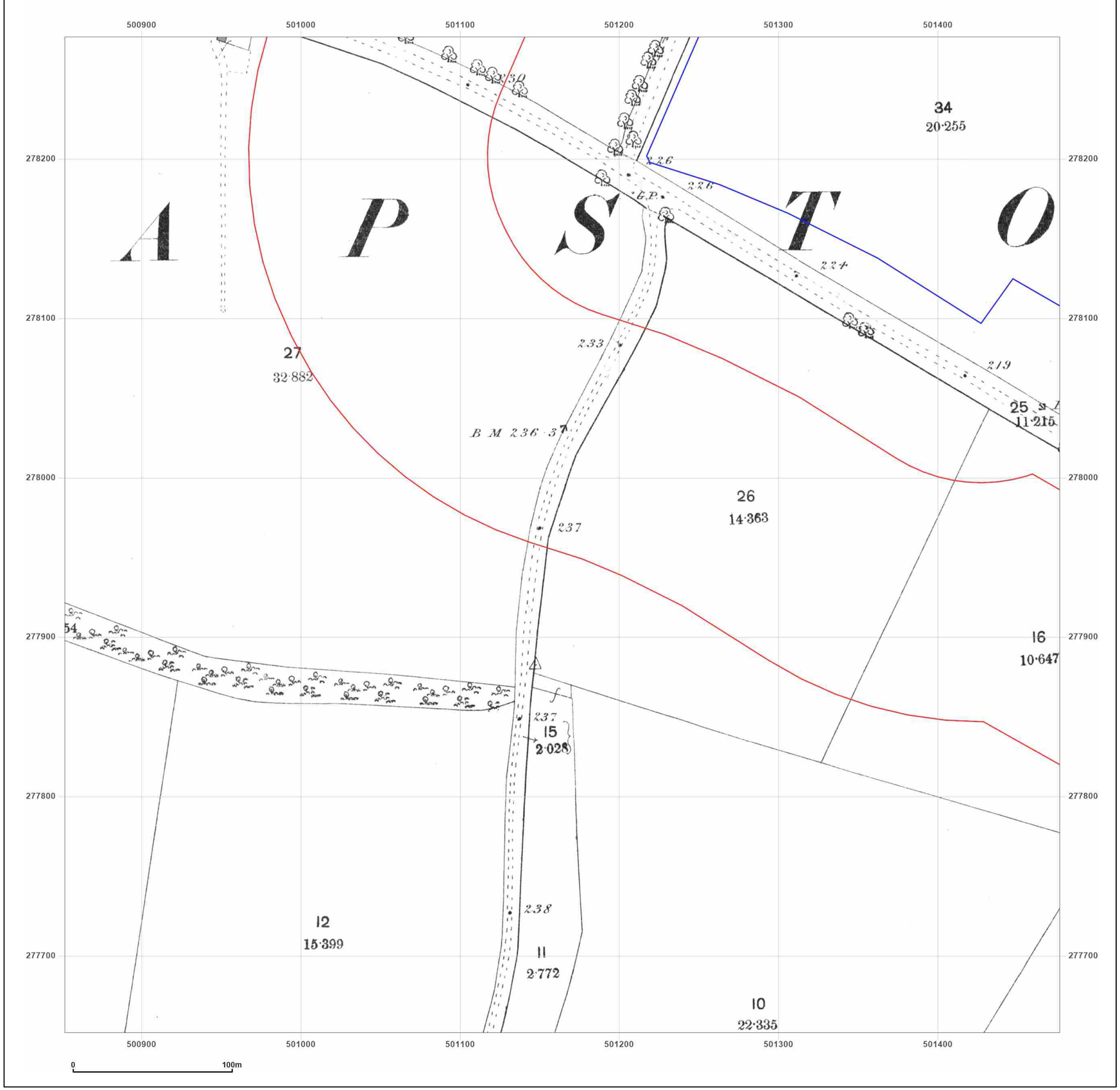

Groundsure INSIGHTS

Site Details:

501767, 278467

Client Ref: C-18443-_Sophie_
Report Ref: GS-7926026_LS_1_1
Grid Ref: 501164, 277964

Map Name: County Series

Map date: **1886**

Scale: 1:2,500

Printed at: 1:2,500

N
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Surveyed 1886
Revised 1886
Edition N/A
Copyright N/A
Levelled N/A

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Production date: 04 June 2021

Map legend available at:
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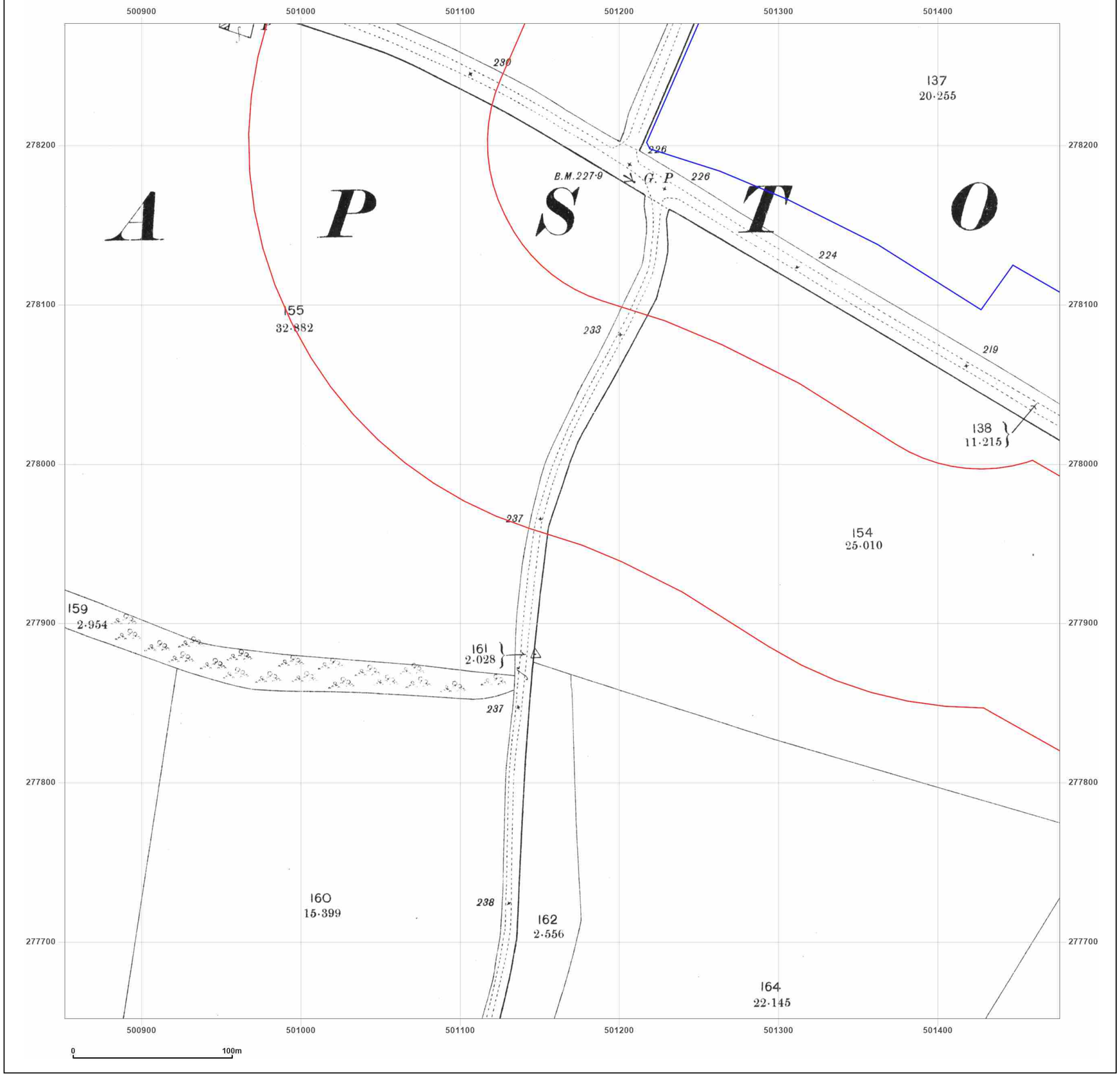

Groundsure INSIGHTS

Site Details:

501767, 278467

Client Ref: C-18443-_Sophie_
Report Ref: GS-7926026_LS_1_1
Grid Ref: 501164, 277964

Map Name: County Series

Map date: **1900**

Scale: 1:2,500

Printed at: 1:2,500

N
W E
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Surveyed 1900
Revised 1900
Edition N/A
Copyright N/A
Levelled N/A

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Production date: 04 June 2021

Map legend available at:
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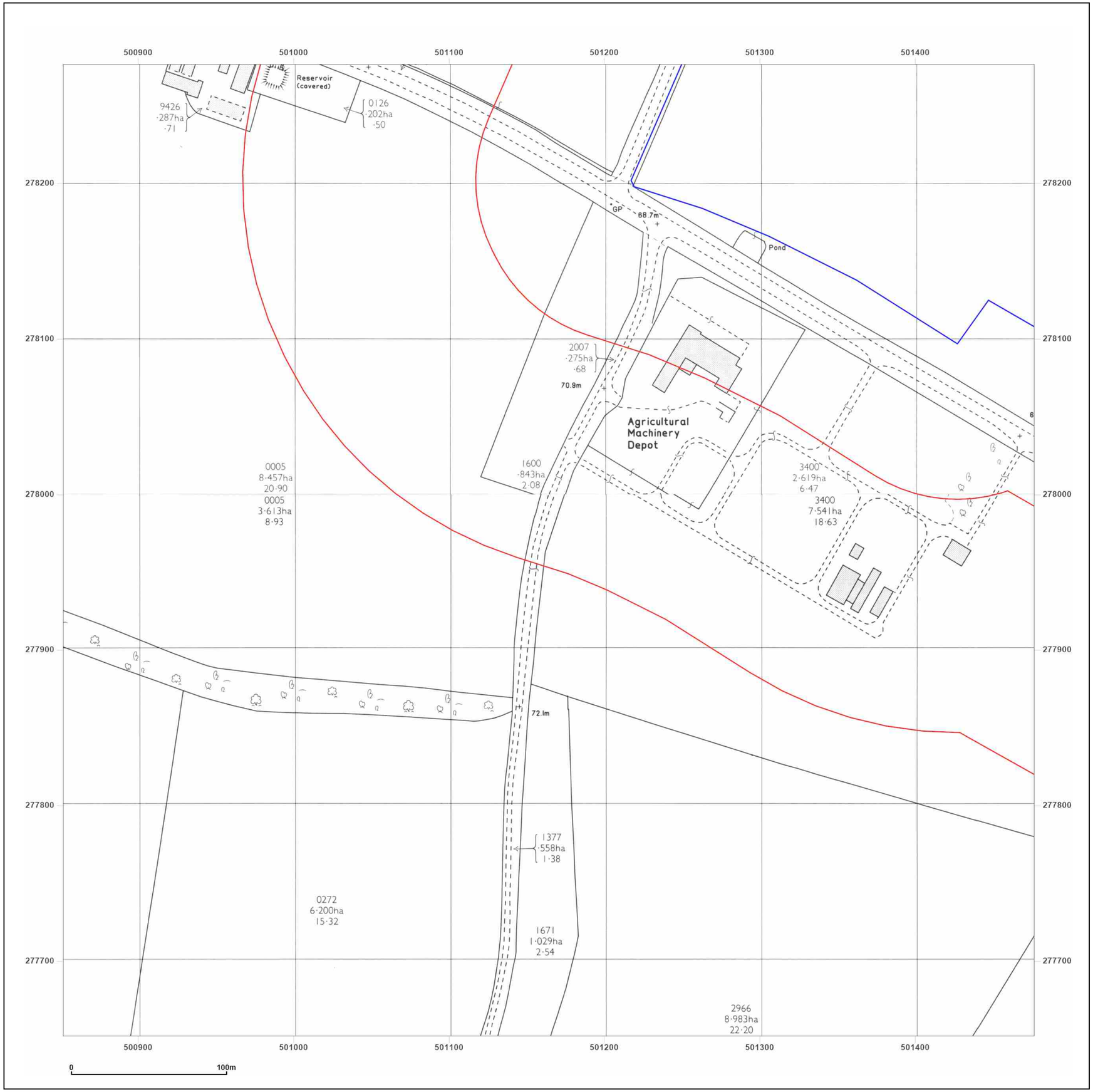

Groundsure INSIGHTS

Site Details:

501767, 278467

Client Ref: C-18443-_Sophie_
Report Ref: GS-7926026_LS_1_1
Grid Ref: 501164, 277964

Map Name: National Grid

Map date: **1974**

Scale: 1:2,500

Printed at: 1:2,500

N
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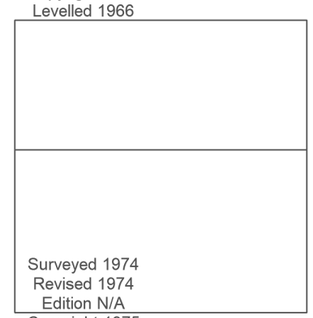
Surveyed 1974
Revised 1974
Edition N/A
Copyright 1975
Levelled 1966



Surveyed 1974
Revised 1974
Edition N/A
Copyright 1975
Levelled 1966

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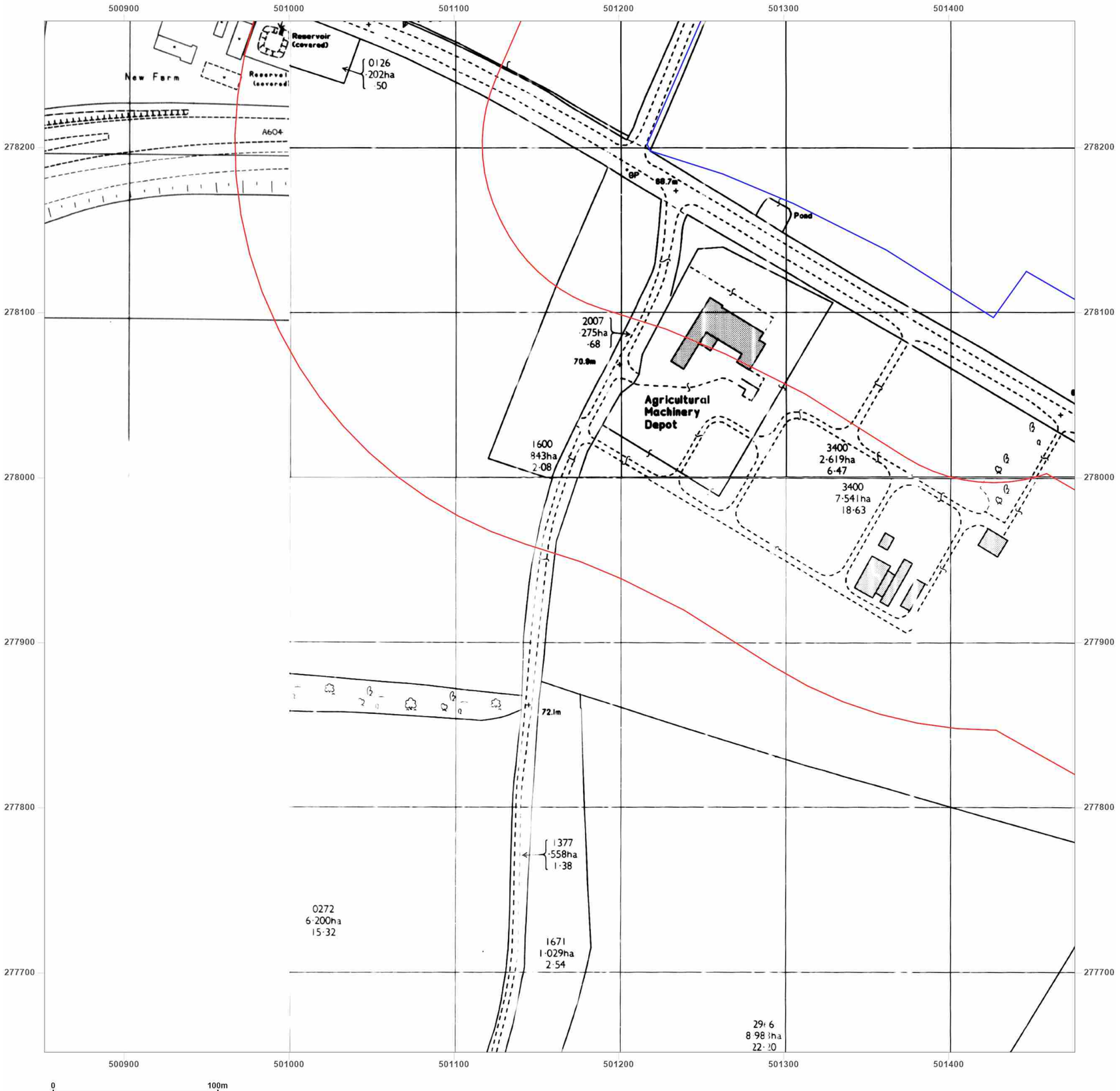

Groundsure INSIGHTS

Site Details:

501767, 278467

Client Ref: C-18443-_Sophie_
Report Ref: GS-7926026_LS_1_1
Grid Ref: 501164, 277964

Map Name: National Grid

Map date: **1974-1975**

Scale: 1:2,500

Printed at: 1:2,500

N
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Surveyed 1974
Revised N/A
Edition N/A
Copyright 1991
Levelled N/A

Surveyed N/A
Revised N/A
Edition N/A
Copyright N/A
Levelled N/A

Surveyed N/A
Revised N/A
Edition N/A
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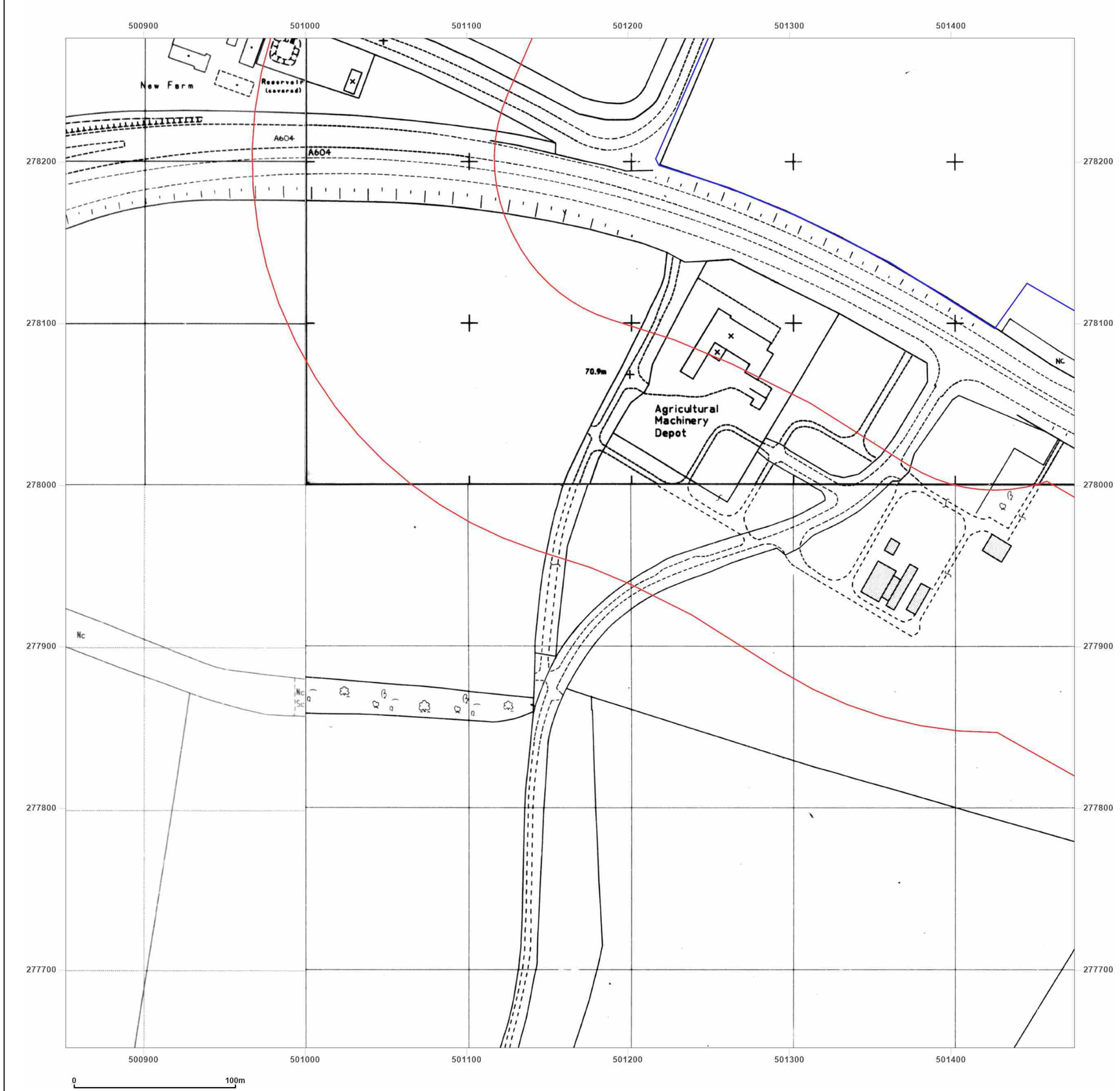

Groundsure INSIGHTS

Site Details:

501767, 278467

Client Ref: C-18443-_Sophie_
Report Ref: GS-7926026_LS_1_1
Grid Ref: 501164, 277964

Map Name: National Grid

Map date: **1991-1993**

Scale: 1:2,500

Printed at: 1:2,500

N
W E
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Surveyed 1974
Revised 1974
Edition N/A
Copyright 1991
Levelled N/A

Surveyed 1991
Revised 1991
Edition N/A
Copyright 1991
Levelled N/A

Surveyed 1993
Revised N/A
Edition N/A
Copyright 1993
Levelled N/A

Surveyed 1966
Revised 1991
Edition N/A
Copyright 1991
Levelled 1966

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Groundsure INSIGHTS

Site Details:

501767, 278467

Client Ref: C-18443-_Sophie_
Report Ref: GS-7926026_LS_1_1
Grid Ref: 501164, 277964

Map Name: National Grid

Map date: **1993**

Scale: 1:2,500

Printed at: 1:2,500

N
W E
S

Surveyed N/A
Revised N/A
Edition N/A
Copyright 1993
Levelled N/A

Surveyed N/A
Revised N/A
Edition N/A
Copyright 1993
Levelled N/A

Surveyed N/A
Revised N/A
Edition N/A
Copyright 1993
Levelled N/A

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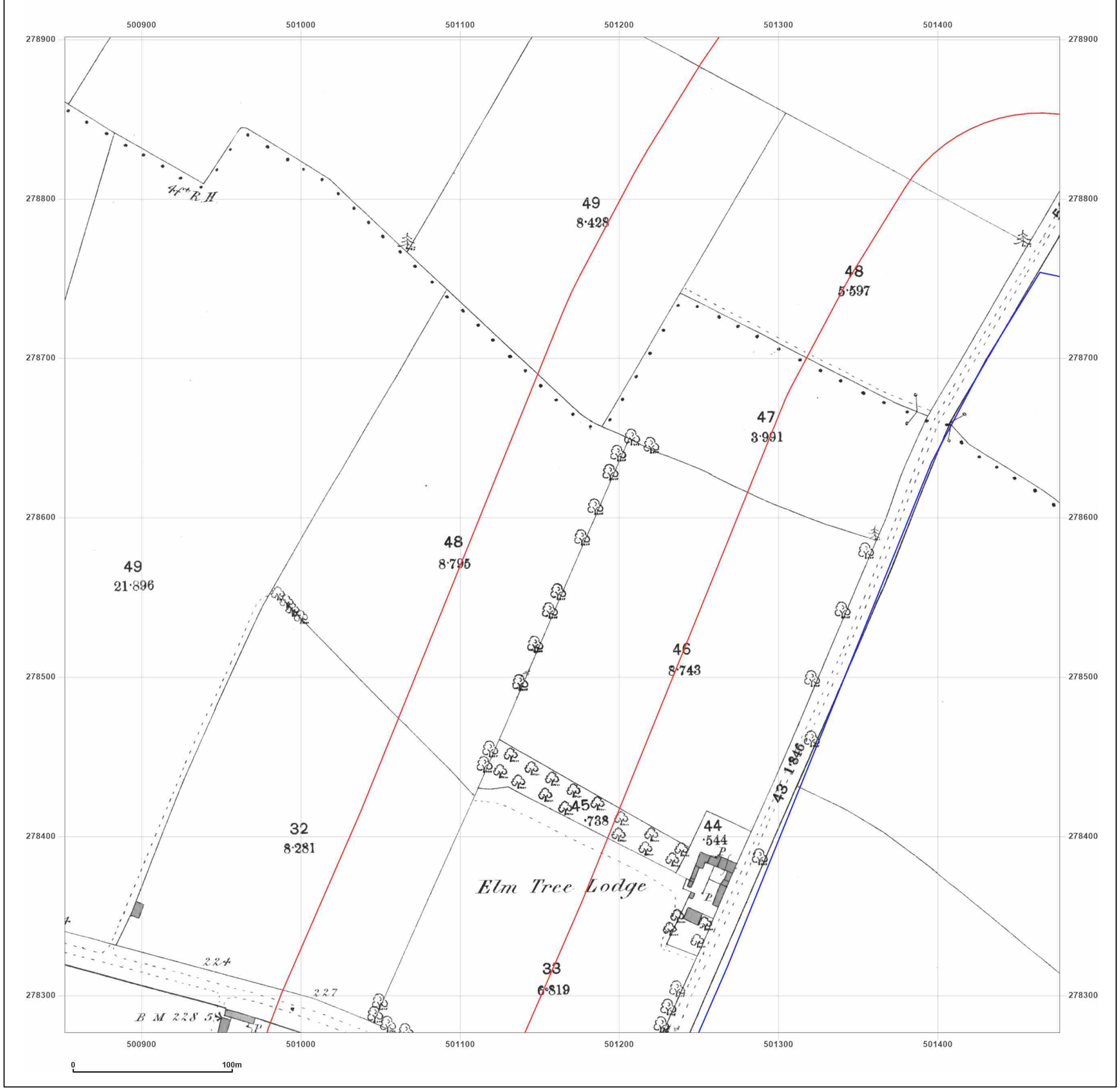

Groundsure INSIGHTS

Site Details:

501767, 278467

Client Ref: C-18443-_Sophie_
Report Ref: GS-7926026_LS_1_2
Grid Ref: 501164, 278589

Map Name: County Series

Map date: **1886**

Scale: 1:2,500

Printed at: 1:2,500

N
W E
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Surveyed 1886
Revised 1886
Edition N/A
Copyright N/A
Levelled N/A

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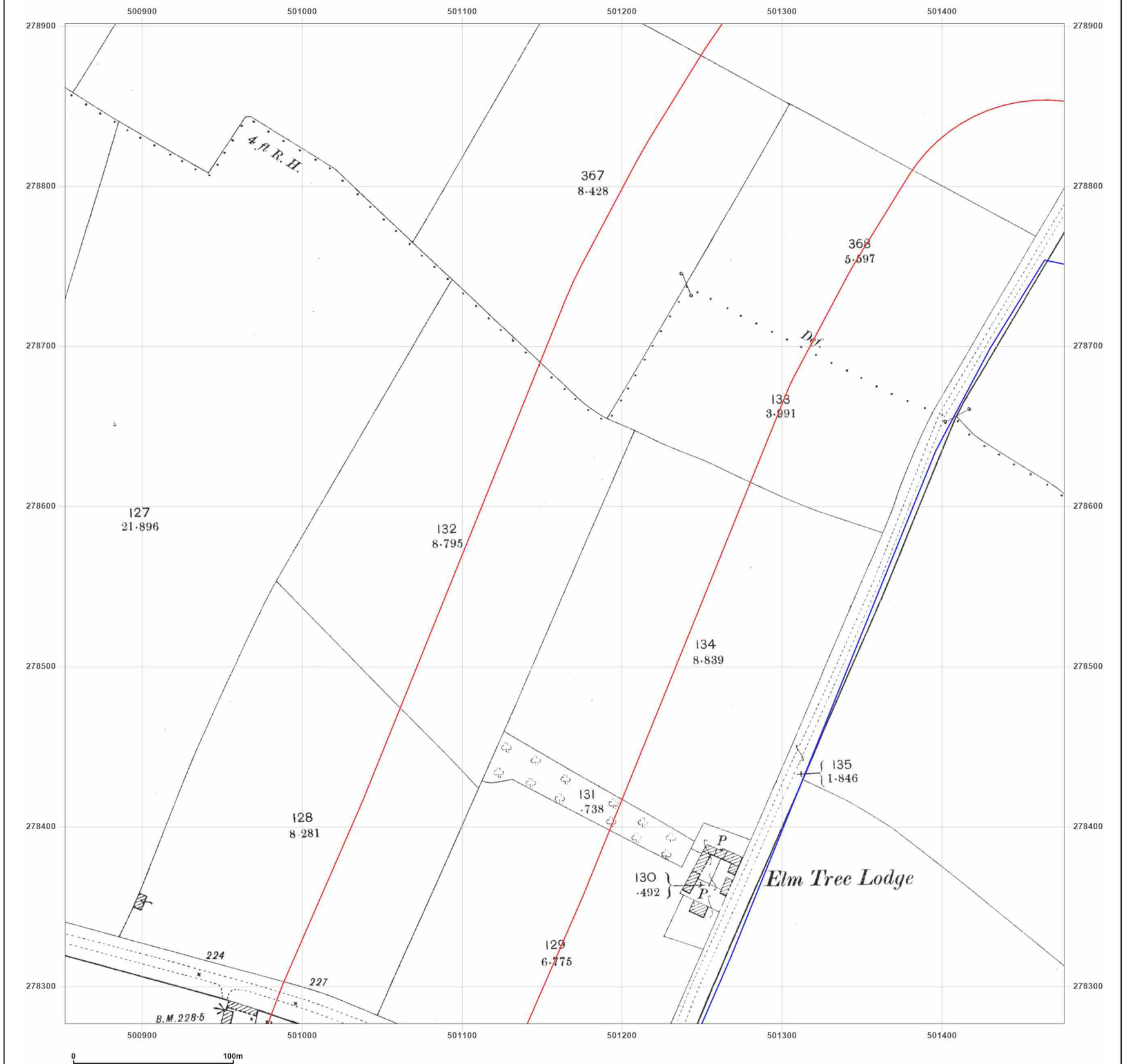

Groundsure INSIGHTS

Site Details:

501767, 278467

Client Ref: C-18443-_Sophie_
Report Ref: GS-7926026_LS_1_2
Grid Ref: 501164, 278589

Map Name: County Series

Map date: **1900**

Scale: 1:2,500

Printed at: 1:2,500

N
W E
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Surveyed 1900
Revised 1900
Edition N/A
Copyright N/A
Levelled N/A

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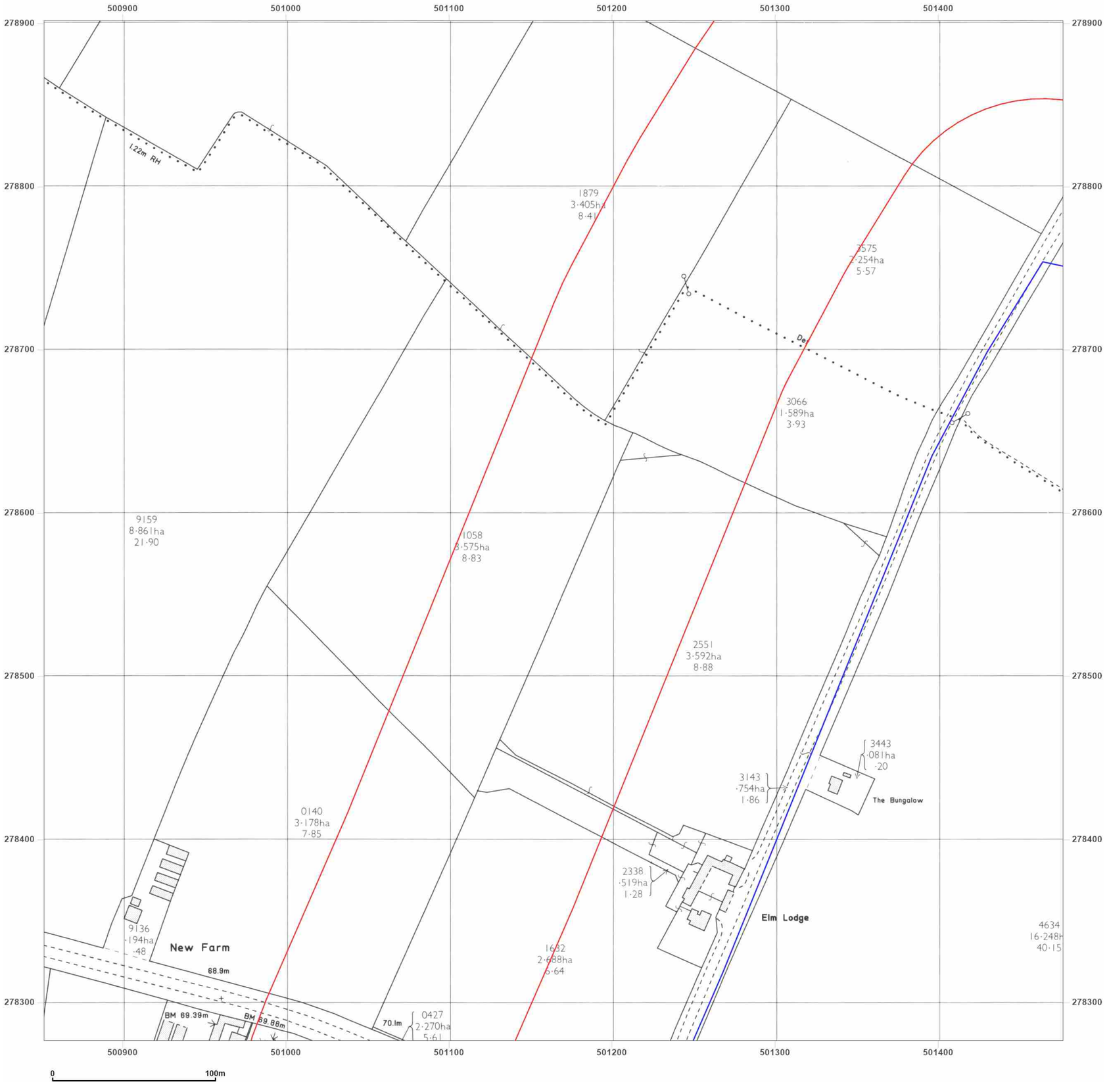

Groundsure INSIGHTS

Site Details:

501767, 278467

Client Ref: C-18443-_Sophie_
Report Ref: GS-7926026_LS_1_2
Grid Ref: 501164, 278589

Map Name: National Grid

Map date: **1974**

Scale: 1:2,500

Printed at: 1:2,500

N
W E
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Surveyed 1974
Revised 1974
Edition N/A
Copyright 1975
Levelled 1966

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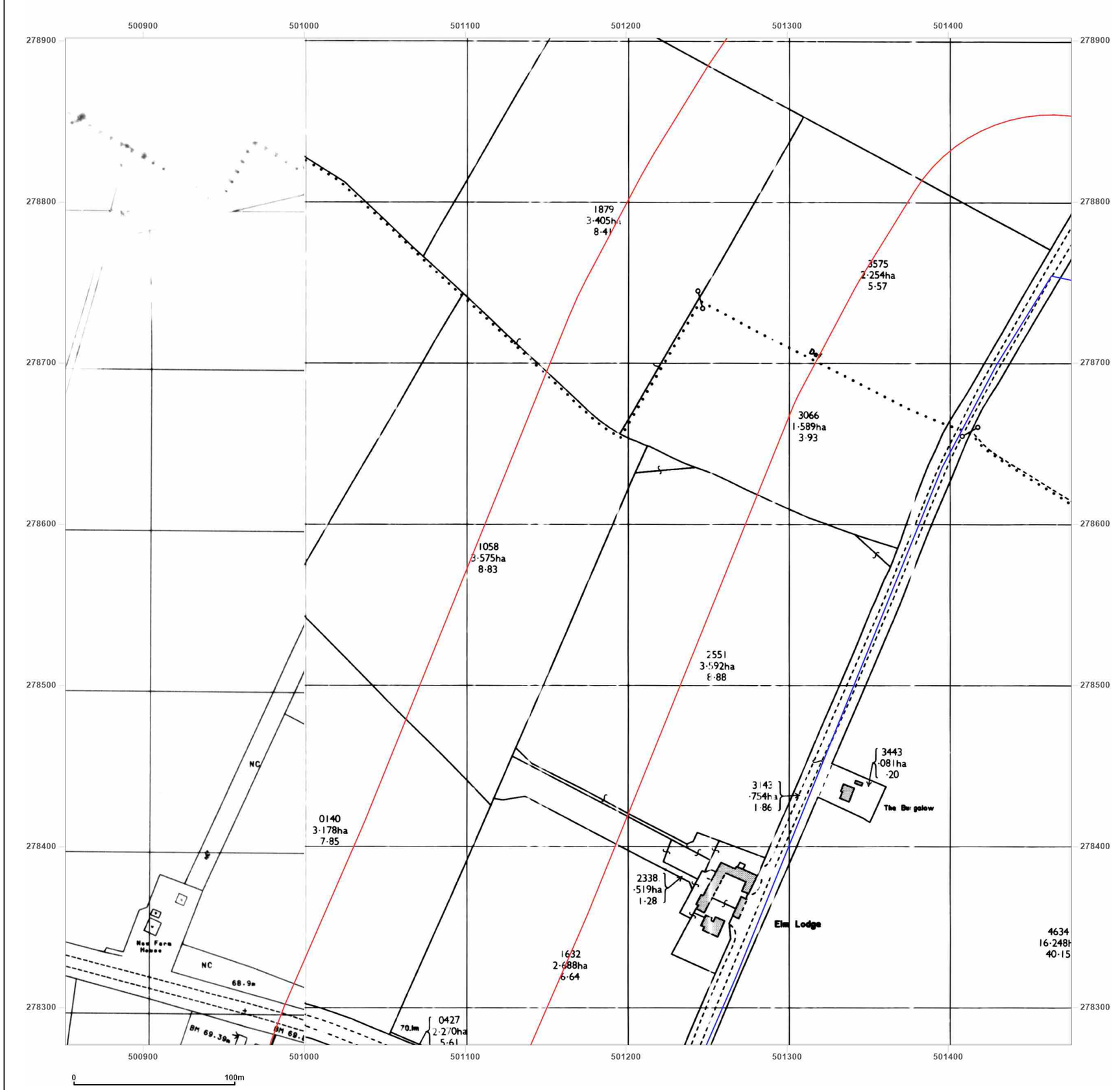

Groundsure INSIGHTS

Site Details:

501767, 278467

Client Ref: C-18443-_Sophie_
Report Ref: GS-7926026_LS_1_2
Grid Ref: 501164, 278589

Map Name: National Grid

Map date: **1974-1975**

Scale: 1:2,500

Printed at: 1:2,500

N
W E
S

Surveyed 1974
Revised N/A
Edition N/A
Copyright 1991
Levelled N/A

Surveyed N/A
Revised N/A
Edition N/A
Copyright N/A
Levelled N/A

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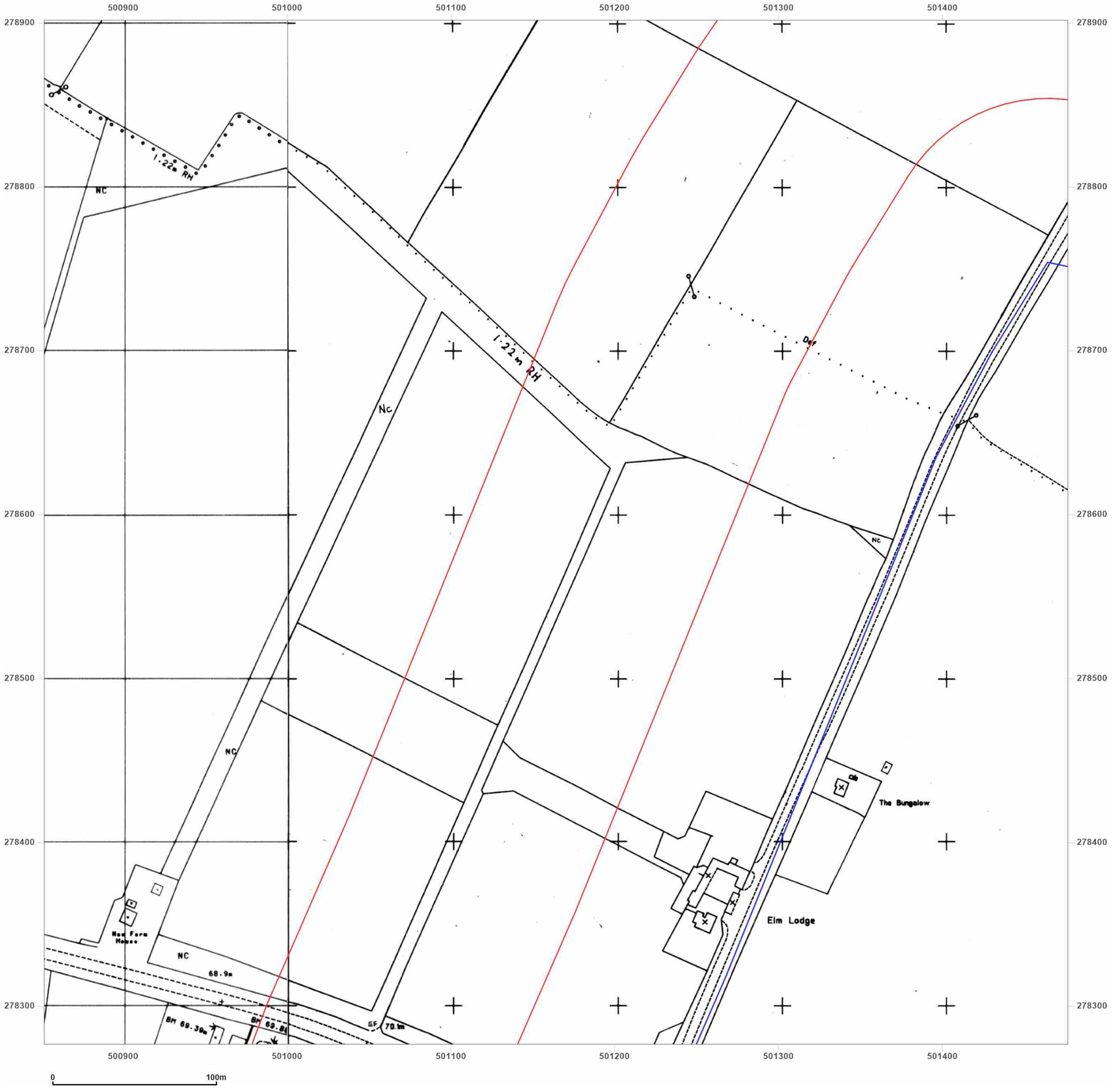

Groundsure INSIGHTS

Site Details:

501767, 278467

Client Ref: C-18443-_Sophie_
Report Ref: GS-7926026_LS_1_2
Grid Ref: 501164, 278589

Map Name: National Grid

Map date: **1991**

Scale: 1:2,500

Printed at: 1:2,500

N
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Surveyed 1974
Revised 1974
Edition N/A
Copyright 1991
Levelled N/A

Surveyed 1991
Revised 1991
Edition N/A
Copyright 1991
Levelled N/A

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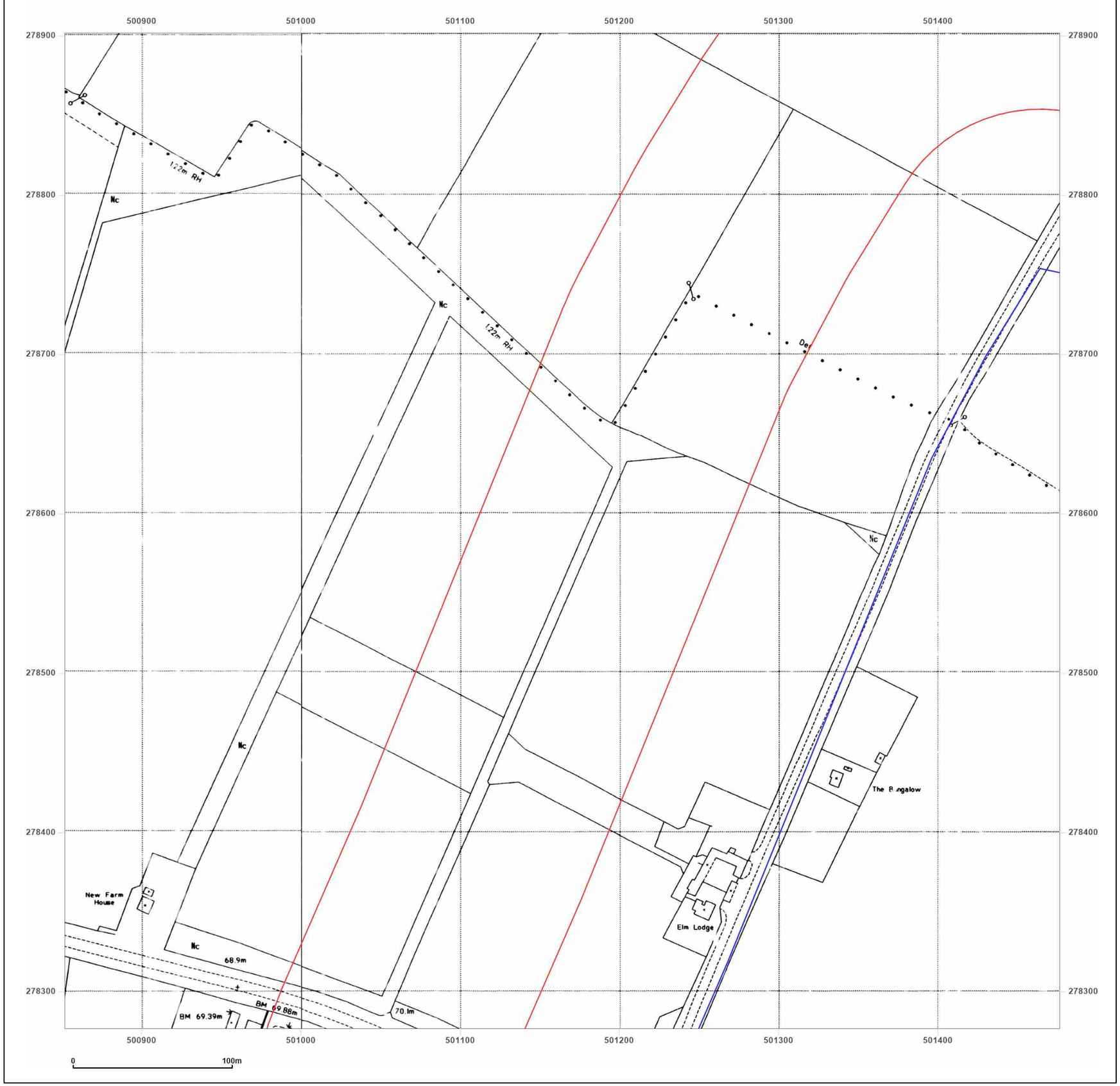

Groundsure INSIGHTS

Site Details:

501767, 278467

Client Ref: C-18443-_Sophie_
Report Ref: GS-7926026_LS_1_2
Grid Ref: 501164, 278589

Map Name: National Grid

Map date: **1993**

Scale: 1:2,500

Printed at: 1:2,500

N
W E
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Surveyed N/A
Revised N/A
Edition N/A
Copyright 1993
Levelled N/A

Surveyed N/A
Revised N/A
Edition N/A
Copyright 1993
Levelled N/A

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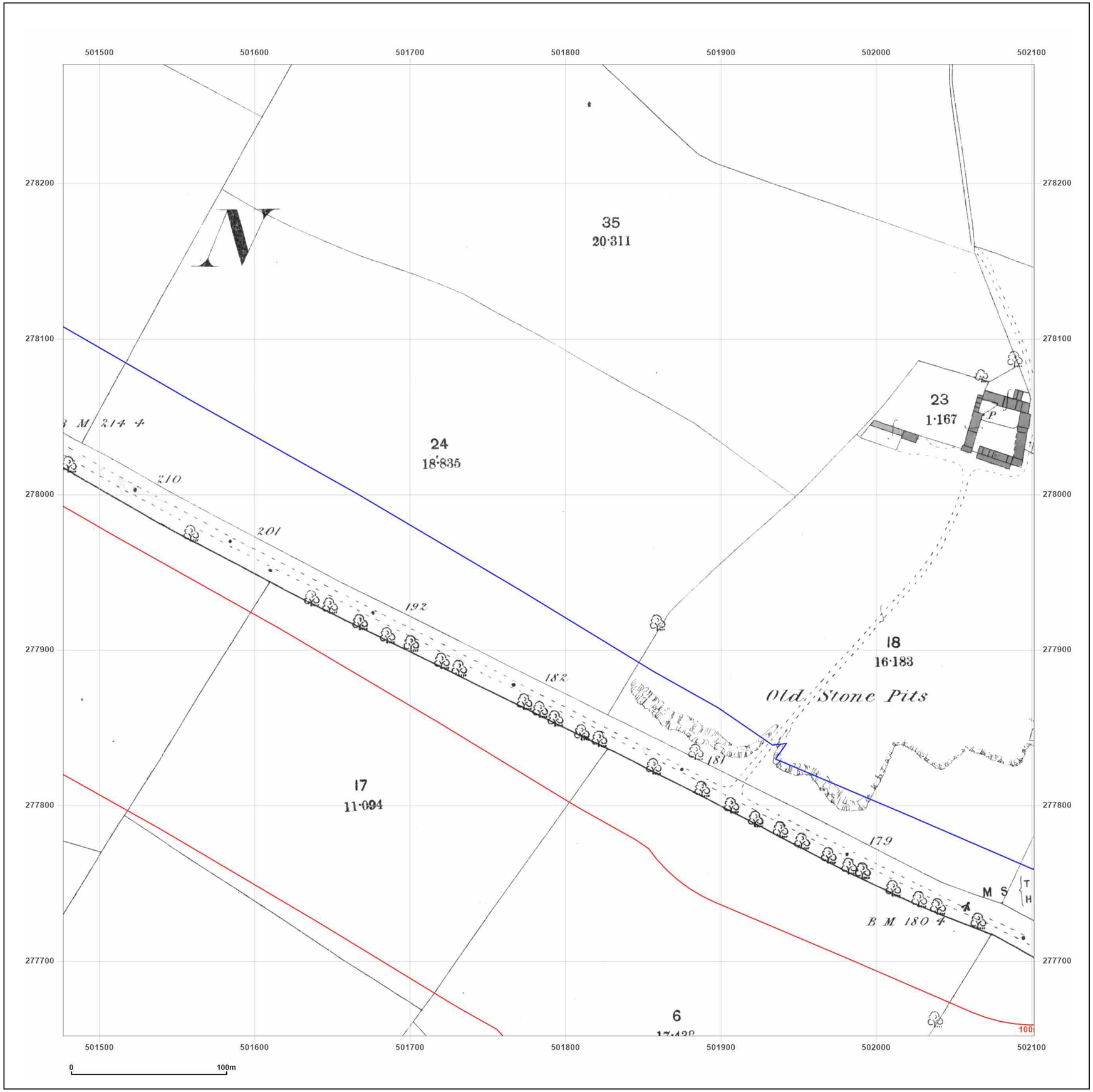

Groundsure INSIGHTS

Site Details:

501767, 278467

Client Ref: C-18443-_Sophie_
Report Ref: GS-7926026_LS_2_1
Grid Ref: 501789, 277964

Map Name: County Series

Map date: **1886**

Scale: 1:2,500

Printed at: 1:2,500

N
W E
S

Surveyed 1886
Revised 1886
Edition N/A
Copyright N/A
Levelled N/A

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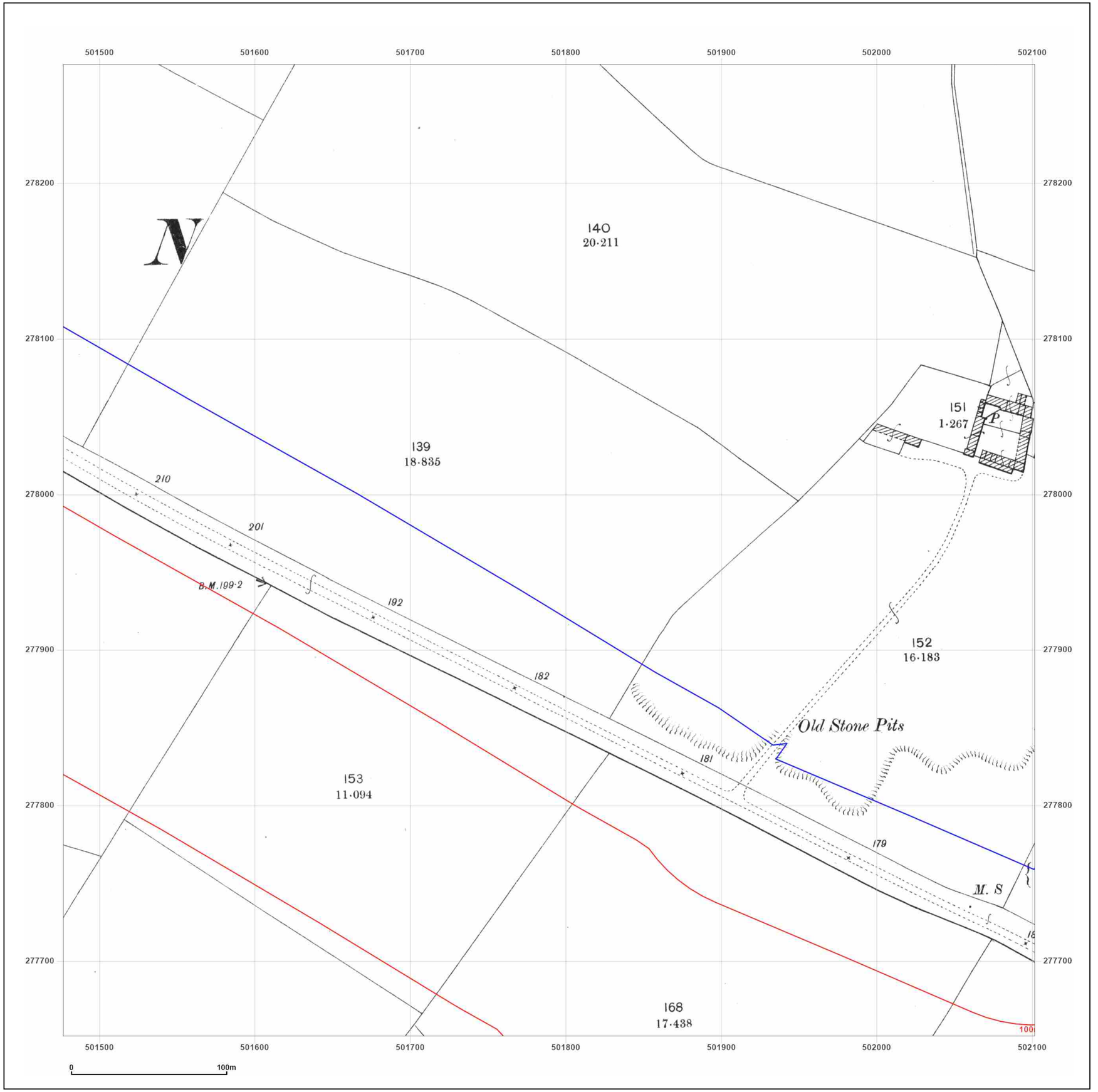

Groundsure INSIGHTS

Site Details:

501767, 278467

Client Ref: C-18443-_Sophie_
Report Ref: GS-7926026_LS_2_1
Grid Ref: 501789, 277964

Map Name: County Series

Map date: **1900**

Scale: 1:2,500

Printed at: 1:2,500

N
W E
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Surveyed 1900
Revised 1900
Edition N/A
Copyright N/A
Levelled N/A

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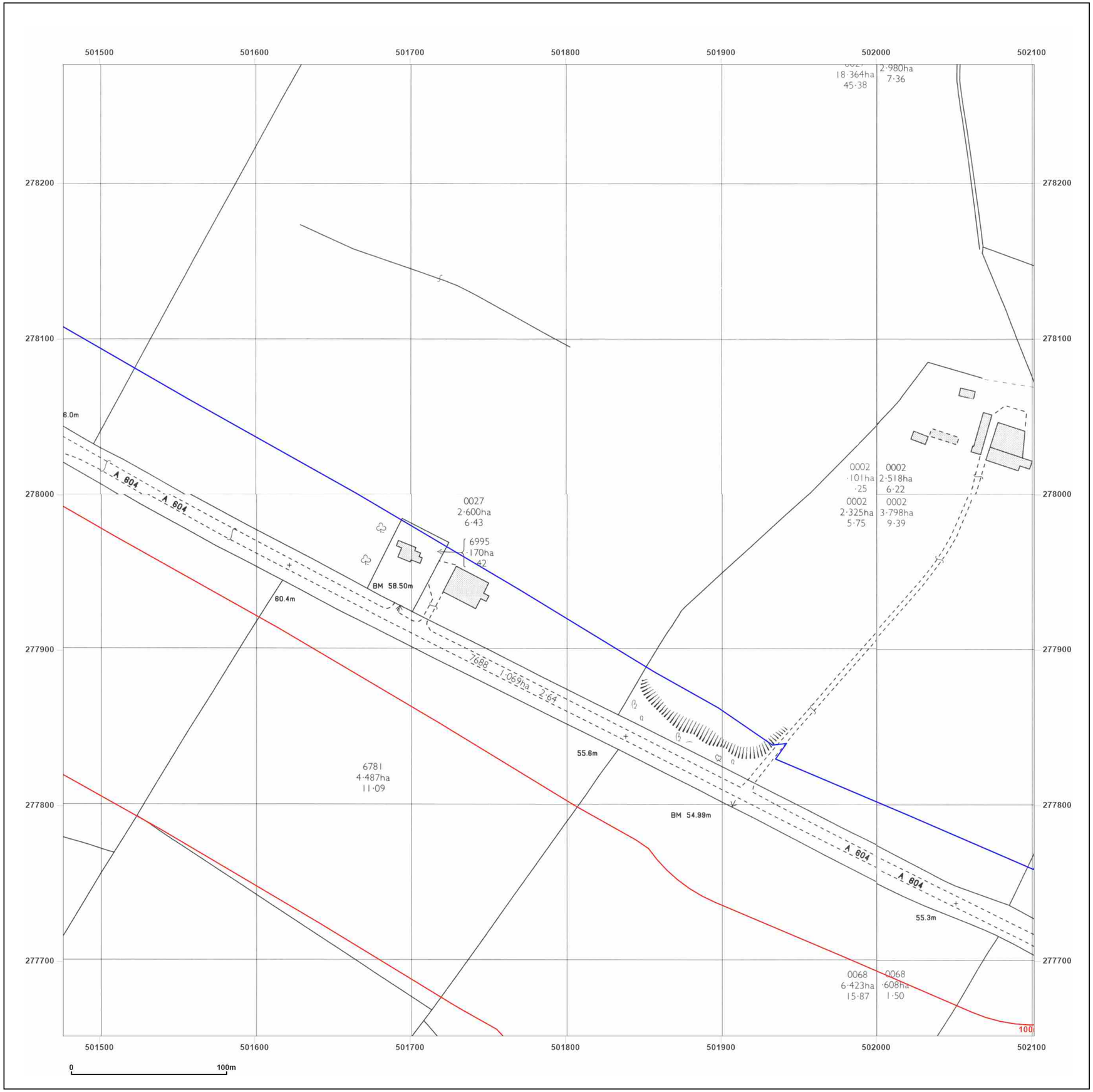

Groundsure INSIGHTS

Site Details:

501767, 278467

Client Ref: C-18443-_Sophie_
Report Ref: GS-7926026_LS_2_1
Grid Ref: 501789, 277964

Map Name: National Grid

Map date: **1974**

Scale: 1:2,500

Printed at: 1:2,500

N
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Surveyed 1974
Revised 1974
Edition N/A
Copyright 1975
Levelled 1966

Surveyed 1974
Revised 1974
Edition N/A
Copyright 1975
Levelled 1966

Surveyed 1974
Revised 1974
Edition N/A
Copyright 1975
Levelled 1966

Surveyed 1974
Revised 1974
Edition N/A
Copyright 1975
Levelled 1966

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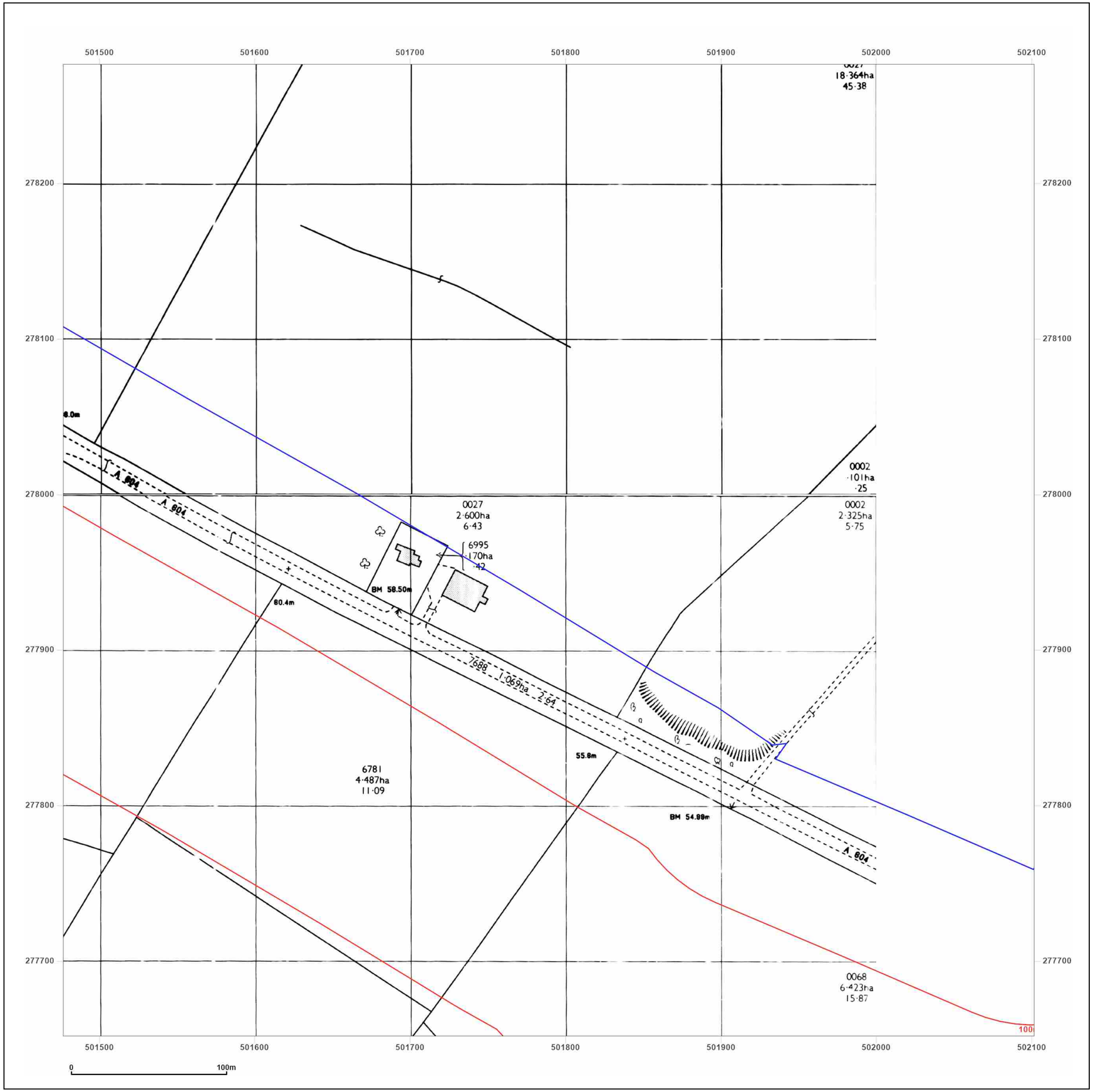


Groundsure INSIGHTS

Site Details:

501767, 278467

Client Ref: C-18443-_Sophie_
Report Ref: GS-7926026_LS_2_1
Grid Ref: 501789, 277964

Map Name: National Grid

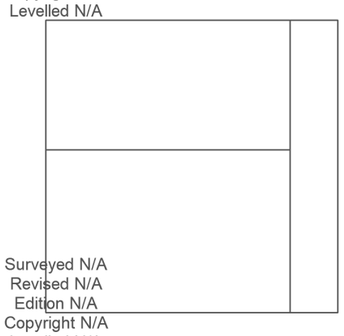
Map date: **1975**

Scale: 1:2,500

Printed at: 1:2,500

N
W E
S

Surveyed N/A
Revised N/A
Edition N/A
Copyright N/A
Levelled N/A



Surveyed N/A
Revised N/A
Edition N/A
Copyright N/A
Levelled N/A

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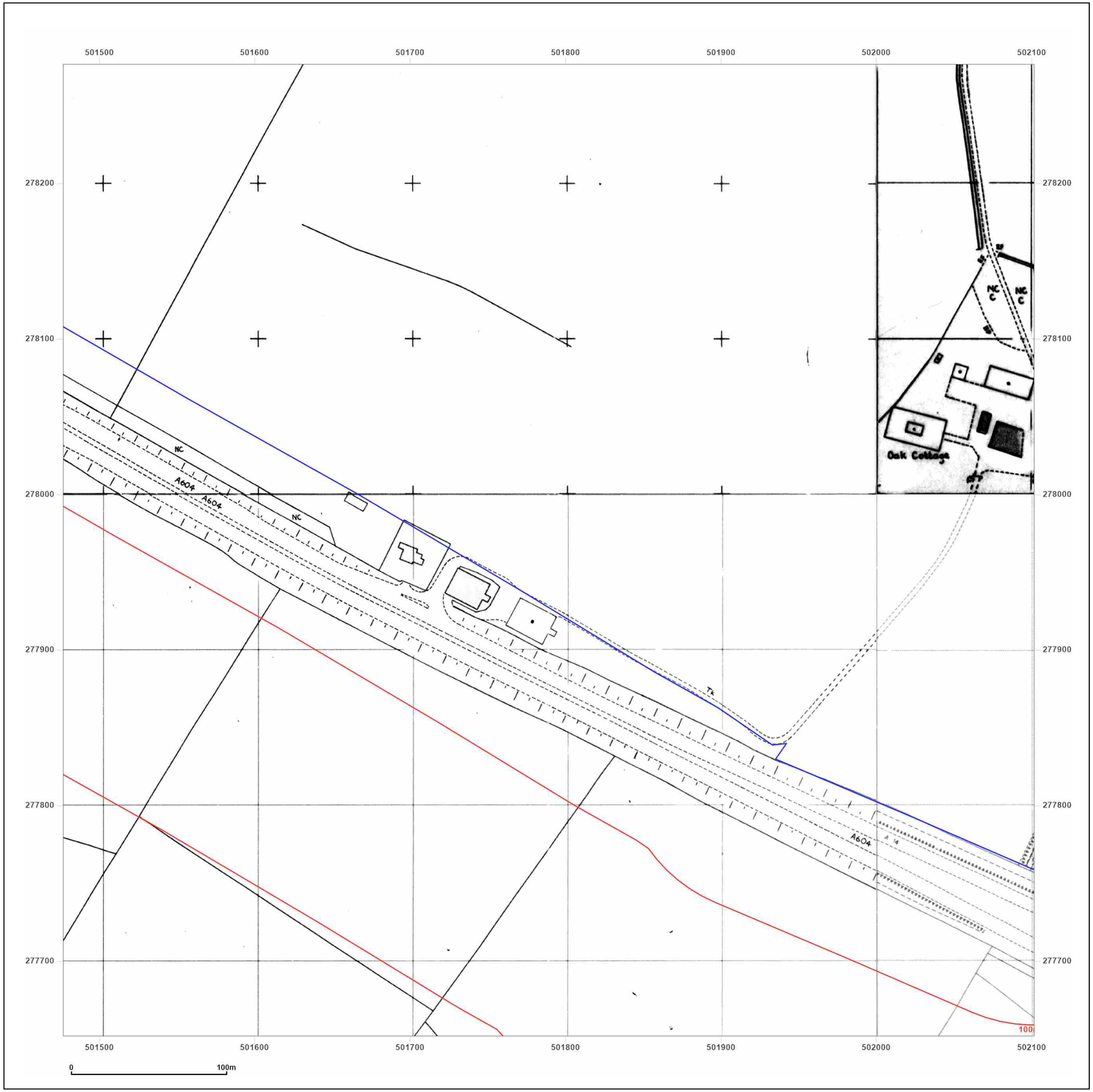

Groundsure INSIGHTS

Site Details:

501767, 278467

Client Ref: C-18443-_Sophie_
Report Ref: GS-7926026_LS_2_1
Grid Ref: 501789, 277964

Map Name: National Grid

Map date: **1991-1993**

Scale: 1:2,500

Printed at: 1:2,500

N
W E
S

Surveyed 1991
Revised 1991
Edition N/A
Copyright 1991
Levelled N/A

Surveyed 1992
Revised 1992
Edition N/A
Copyright 1992
Levelled N/A

Surveyed 1966
Revised 1991
Edition N/A
Copyright 1991
Levelled 1966

Surveyed 1993
Revised N/A
Edition N/A
Copyright 1993
Levelled N/A

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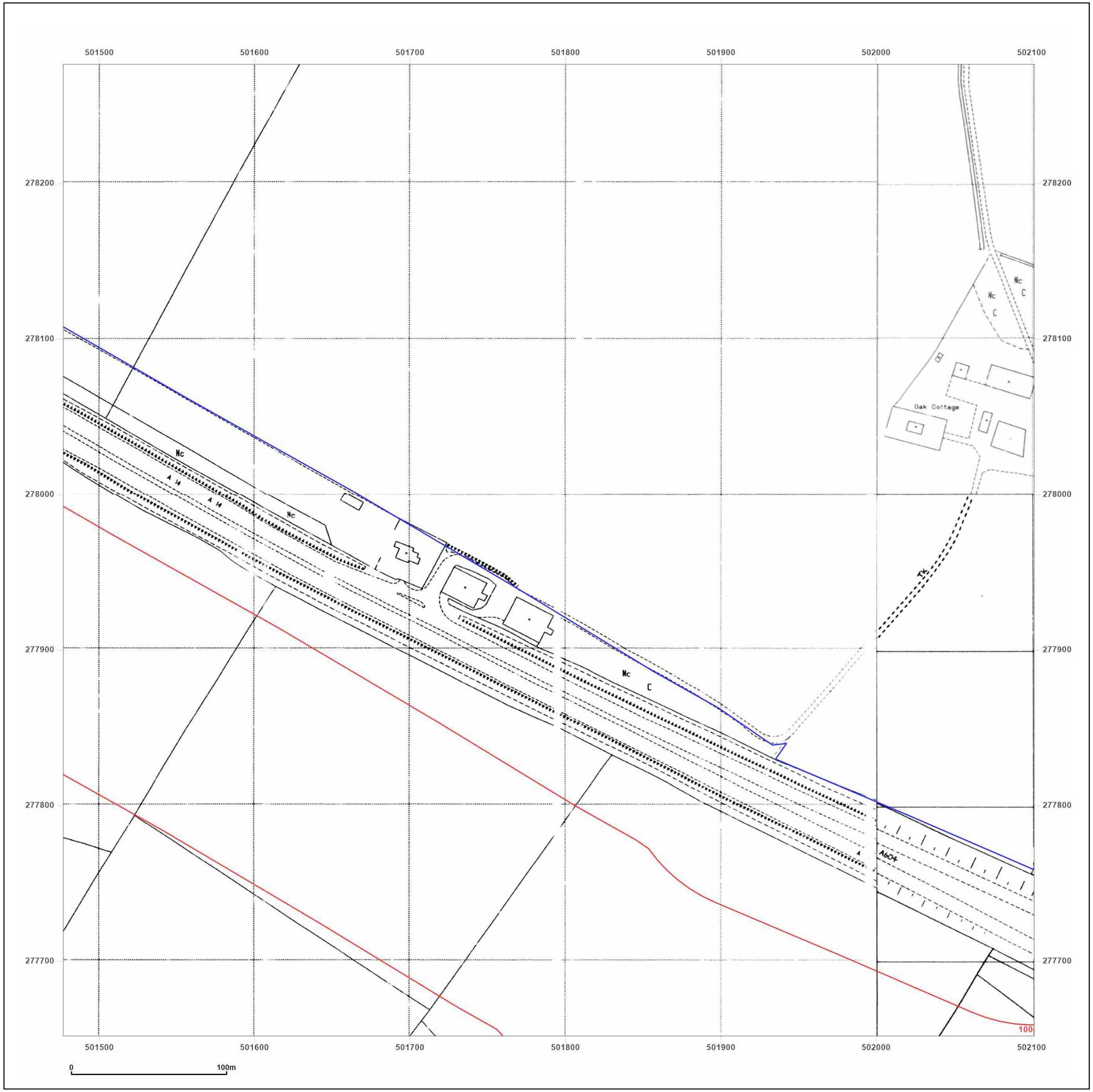

Groundsure INSIGHTS

Site Details:

501767, 278467

Client Ref: C-18443-_Sophie_
Report Ref: GS-7926026_LS_2_1
Grid Ref: 501789, 277964

Map Name: National Grid

Map date: **1991-1993**

Scale: 1:2,500

Printed at: 1:2,500

N
W E
S

Surveyed N/A
Revised N/A
Edition N/A
Copyright 1993
Levelled N/A

Surveyed 1993
Revised N/A
Edition N/A
Copyright 1993
Levelled N/A

Surveyed N/A
Revised N/A
Edition N/A
Copyright 1993
Levelled N/A

Surveyed 1991
Revised 1991
Edition N/A
Copyright 1991
Levelled N/A

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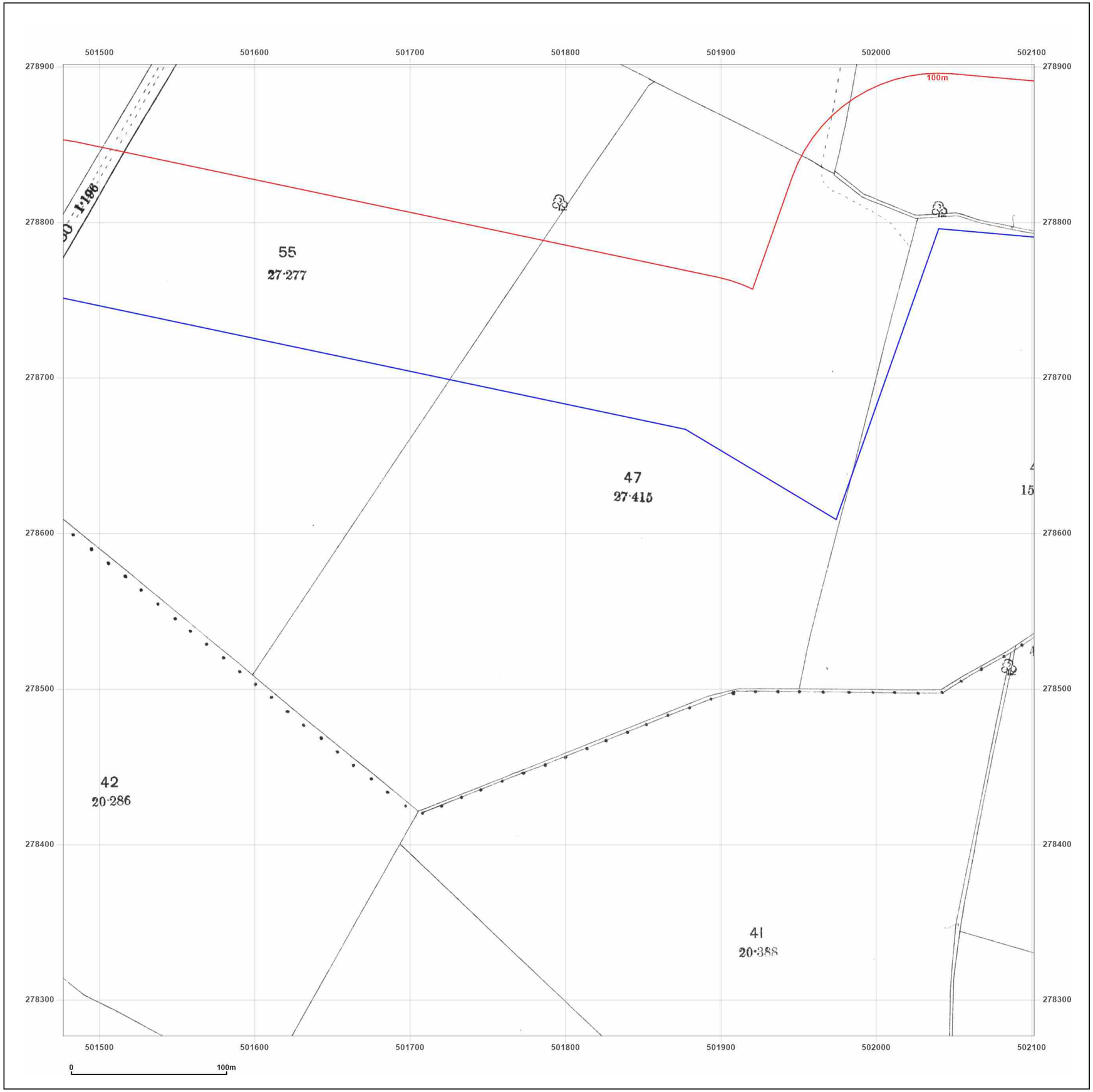

Groundsure INSIGHTS

Site Details:

501767, 278467

Client Ref: C-18443-_Sophie_
Report Ref: GS-7926026_LS_2_2
Grid Ref: 501789, 278589

Map Name: County Series

Map date: **1886**

Scale: 1:2,500

Printed at: 1:2,500

N
W E
S

Surveyed 1886
Revised 1886
Edition N/A
Copyright N/A
Levelled N/A

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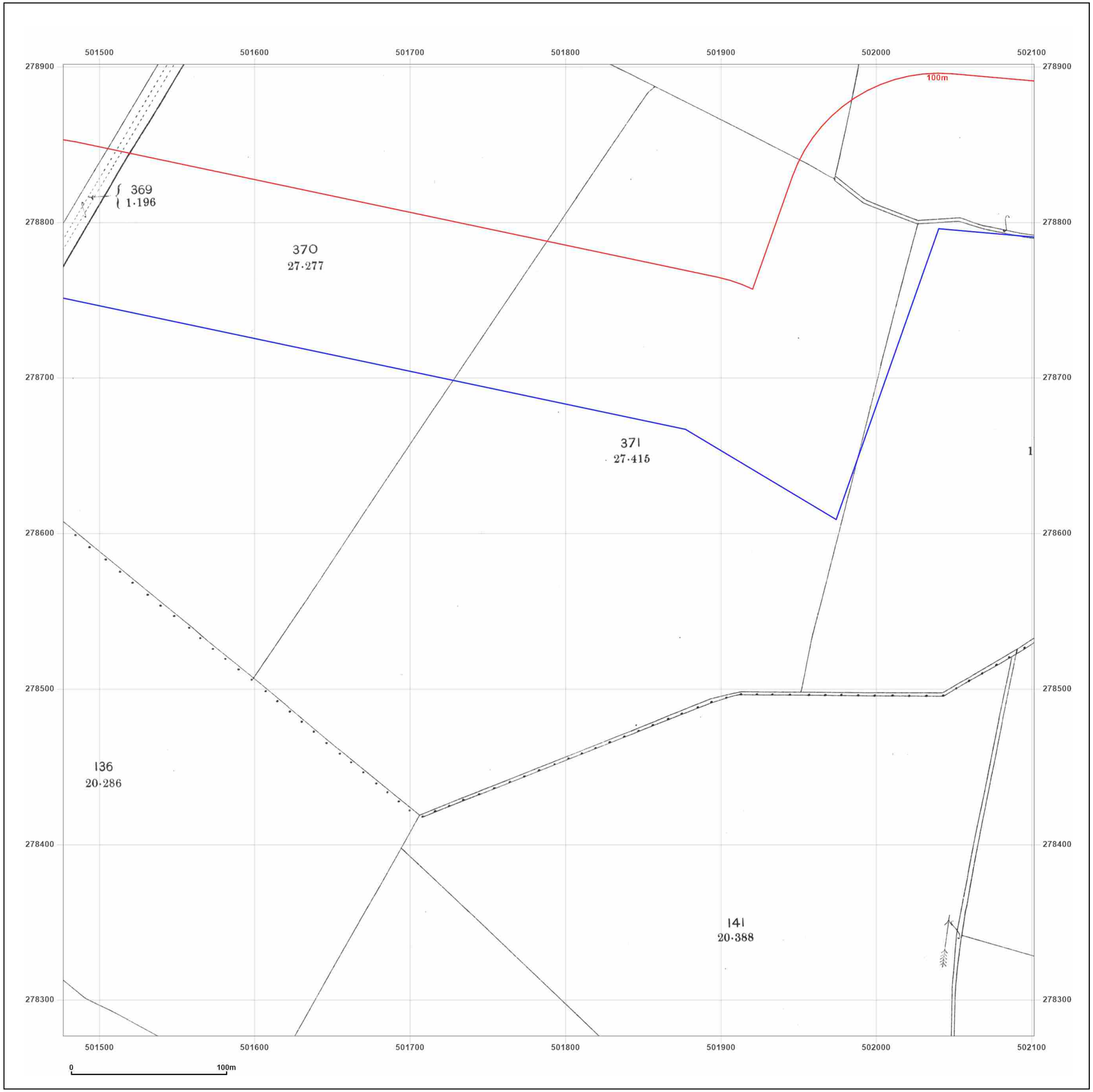

Groundsure INSIGHTS

Site Details:

501767, 278467

Client Ref: C-18443-_Sophie_
Report Ref: GS-7926026_LS_2_2
Grid Ref: 501789, 278589

Map Name: County Series

Map date: **1900**

Scale: 1:2,500

Printed at: 1:2,500

N
W E
S

Surveyed 1900
Revised 1900
Edition N/A
Copyright N/A
Levelled N/A

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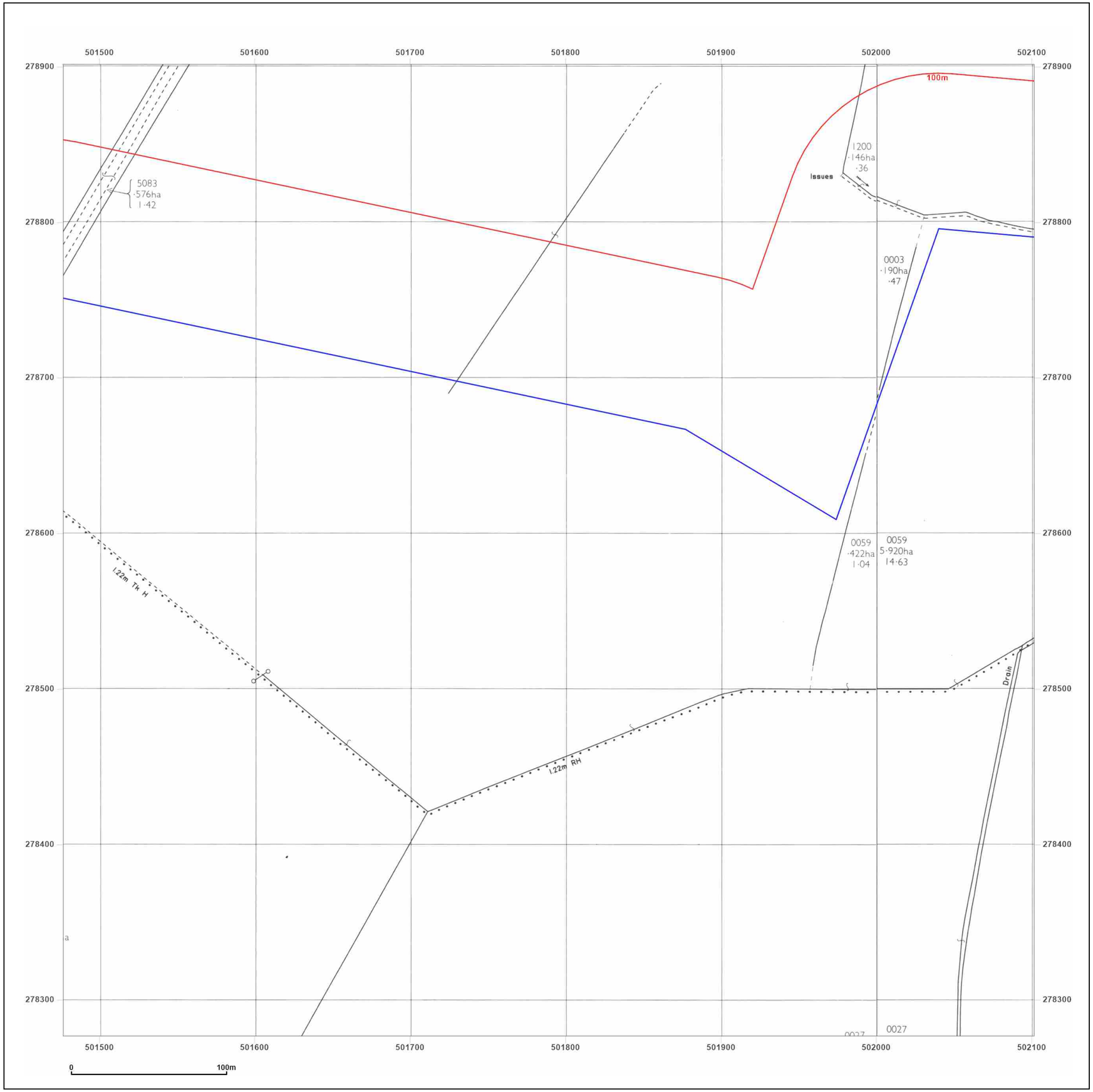

Groundsure INSIGHTS

Site Details:

501767, 278467

Client Ref: C-18443-_Sophie_
Report Ref: GS-7926026_LS_2_2
Grid Ref: 501789, 278589

Map Name: National Grid

Map date: **1974**

Scale: 1:2,500

Printed at: 1:2,500

N
W E
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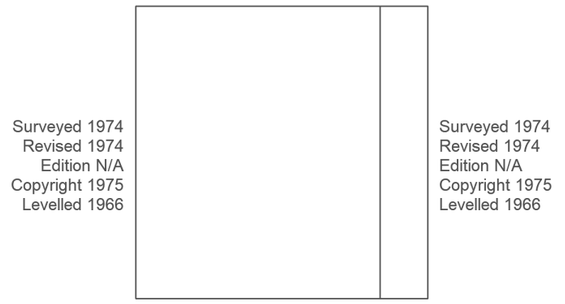

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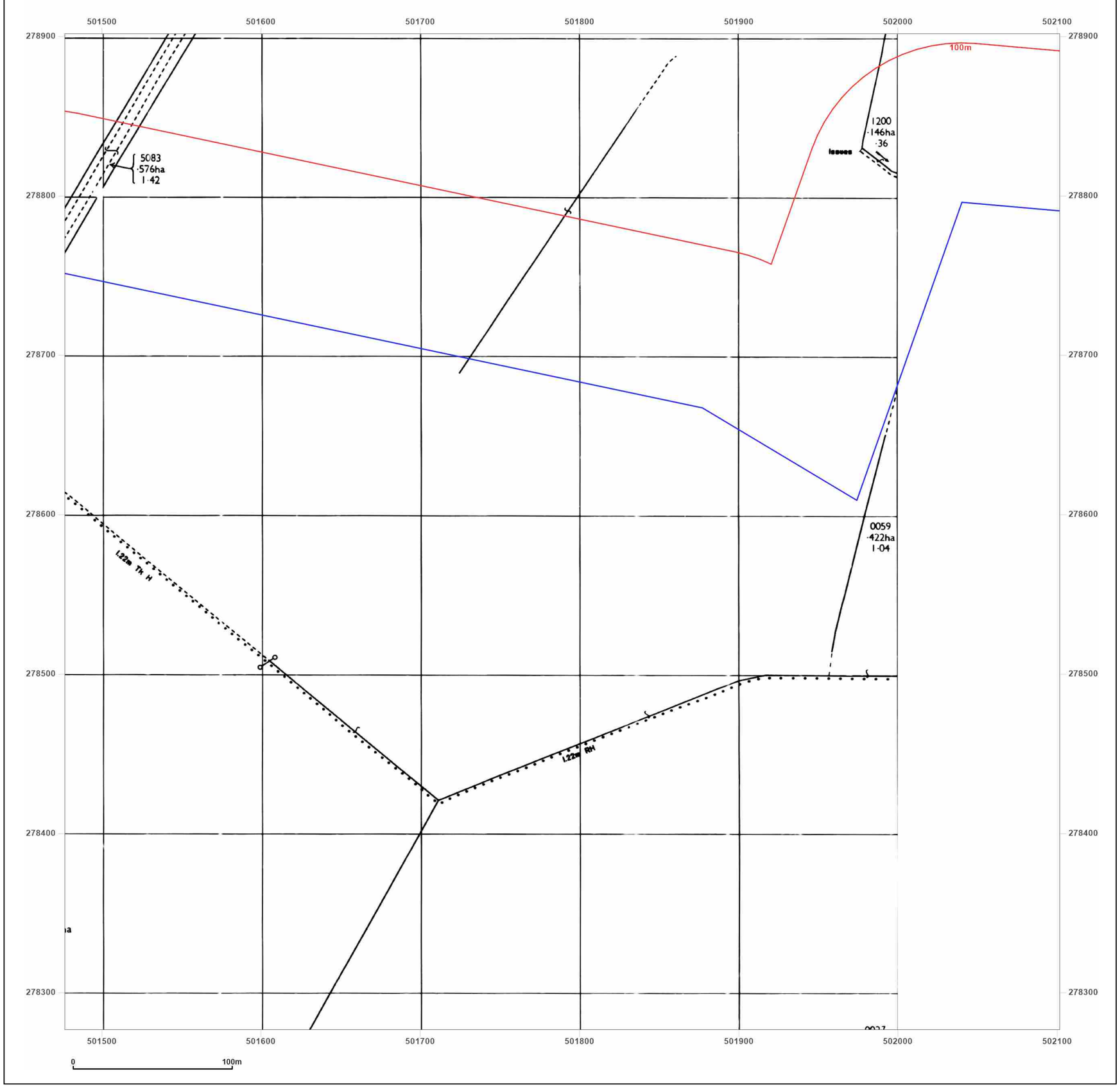

Site Details:

501767, 278467

Client Ref: C-18443-_Sophie_
Report Ref: GS-7926026_LS_2_2
Grid Ref: 501789, 278589

Map Name: National Grid

Map date: **1975**

Scale: 1:2,500

Printed at: 1:2,500

N
W E
S

Surveyed N/A
Revised N/A
Edition N/A
Copyright N/A
Levelled N/A

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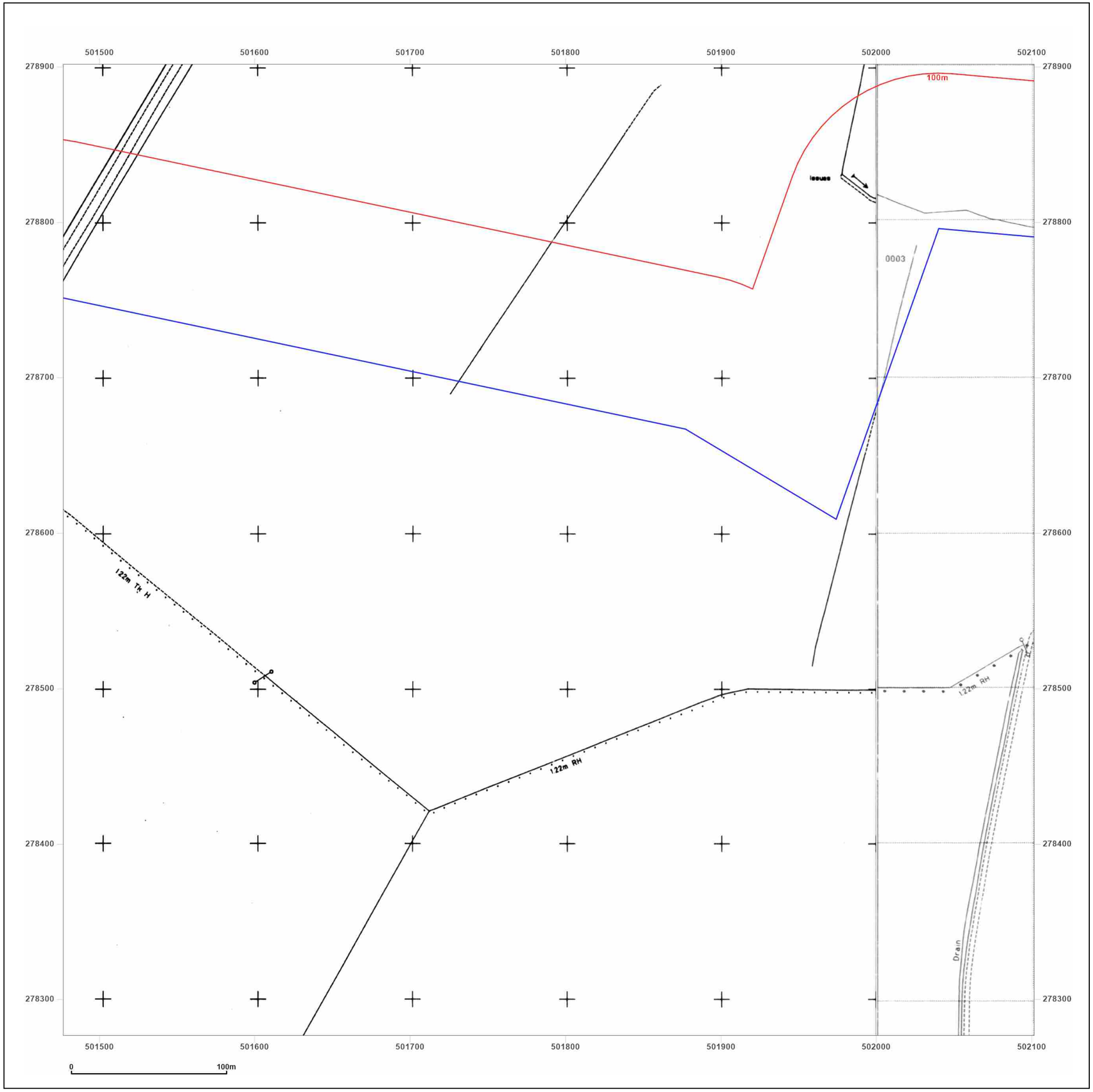

Groundsure INSIGHTS

Site Details:

501767, 278467

Client Ref: C-18443-_Sophie_
Report Ref: GS-7926026_LS_2_2
Grid Ref: 501789, 278589

Map Name: National Grid

Map date: **1991-1993**

Scale: 1:2,500

Printed at: 1:2,500

N
W E
S

Surveyed 1991	Surveyed 1993
Revised 1991	Revised N/A
Edition N/A	Edition N/A
Copyright 1991	Copyright 1993
Levelled N/A	Levelled N/A

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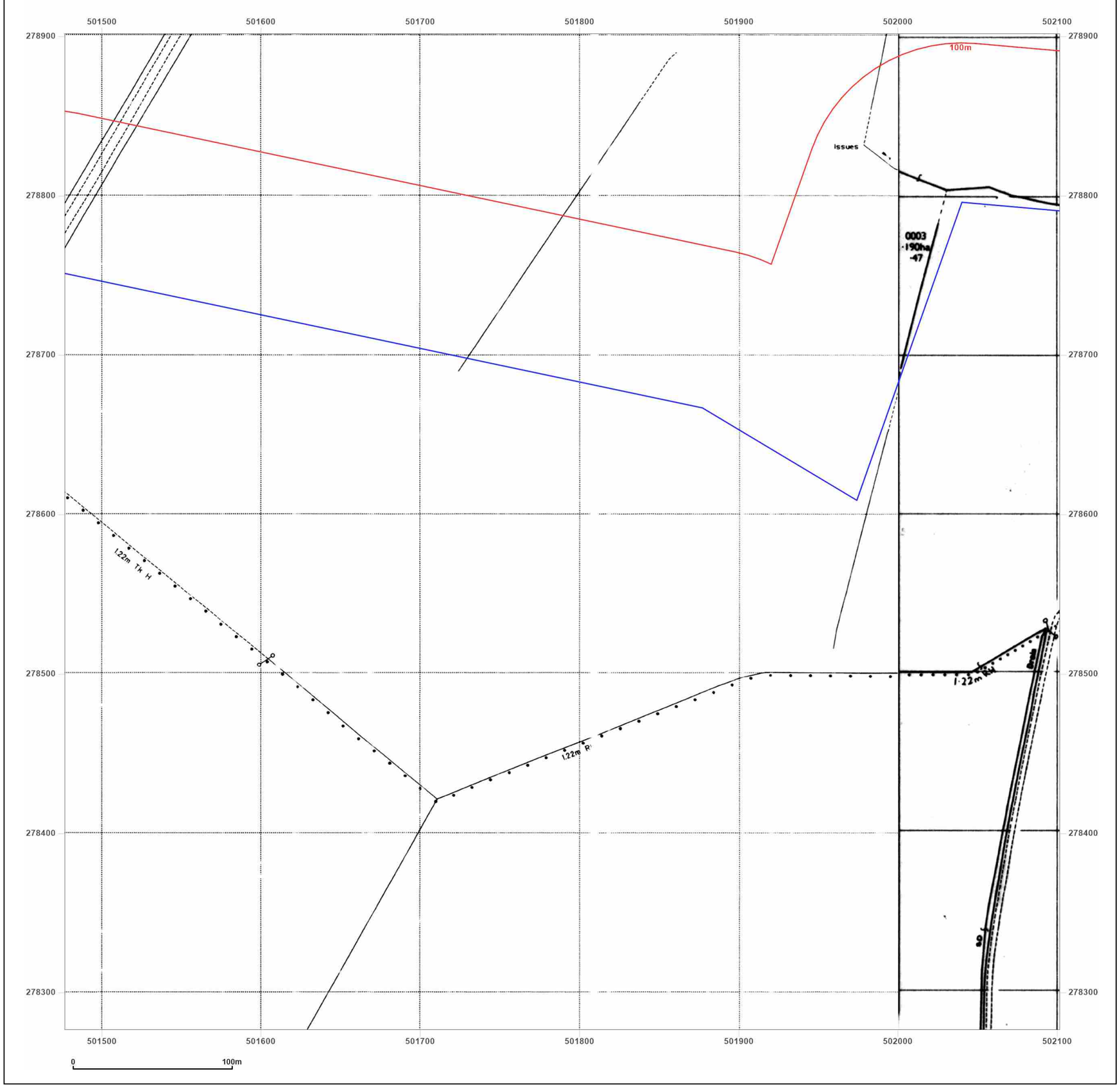

Groundsure INSIGHTS

Site Details:

501767, 278467

Client Ref: C-18443-_Sophie_
Report Ref: GS-7926026_LS_2_2
Grid Ref: 501789, 278589

Map Name: National Grid

Map date: **1992-1993**

Scale: 1:2,500

Printed at: 1:2,500

N
W E
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Surveyed N/A
Revised N/A
Edition N/A
Copyright 1993
Levelled N/A

Surveyed 1992
Revised 1992
Edition N/A
Copyright 1992
Levelled N/A

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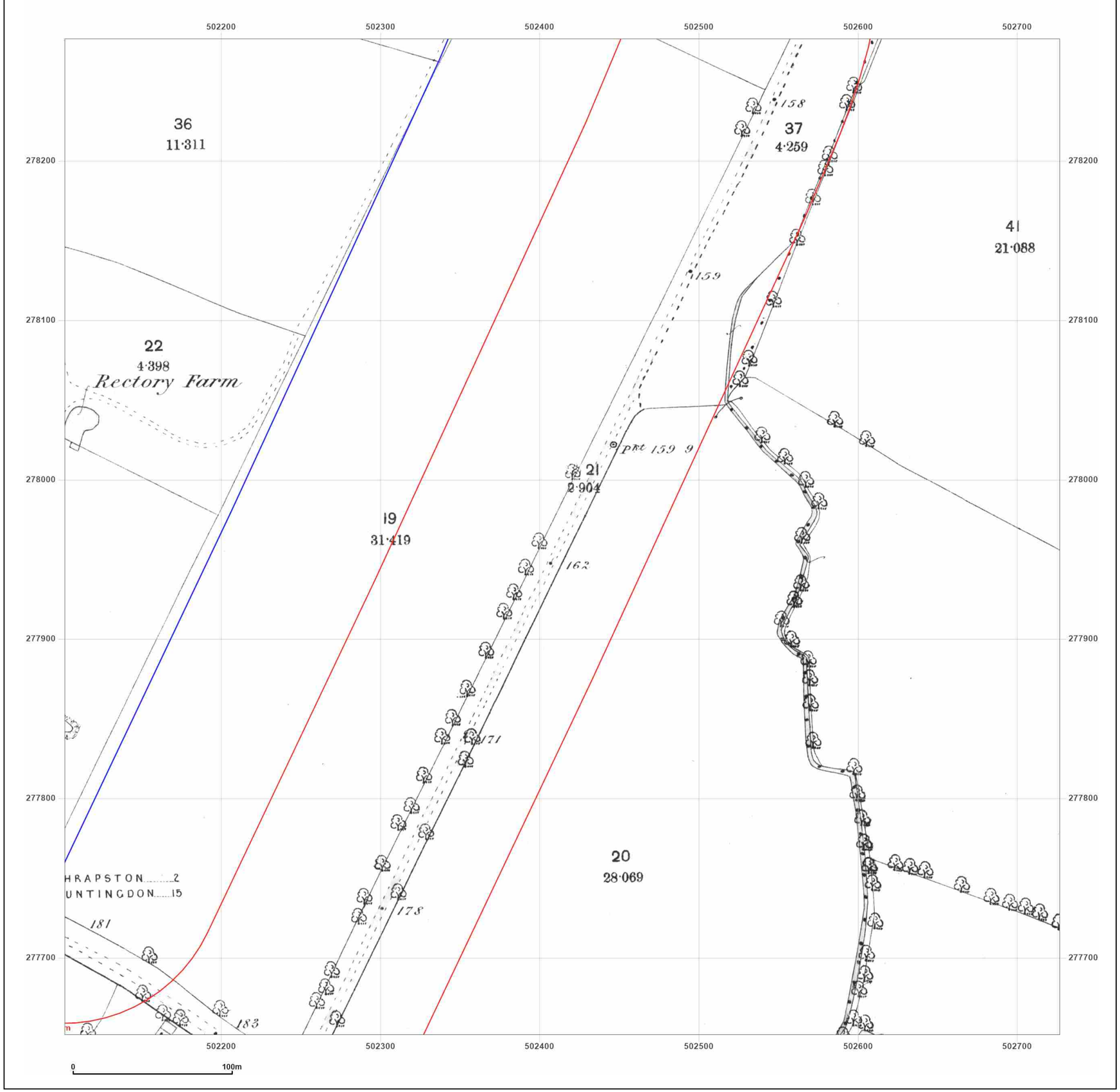

Groundsure INSIGHTS

Site Details:

501767, 278467

Client Ref: C-18443-_Sophie_
Report Ref: GS-7926026_LS_3_1
Grid Ref: 502414, 277964

Map Name: County Series

Map date: **1886**

Scale: 1:2,500

Printed at: 1:2,500

N
W E
S

Surveyed 1886
Revised 1886
Edition N/A
Copyright N/A
Levelled N/A

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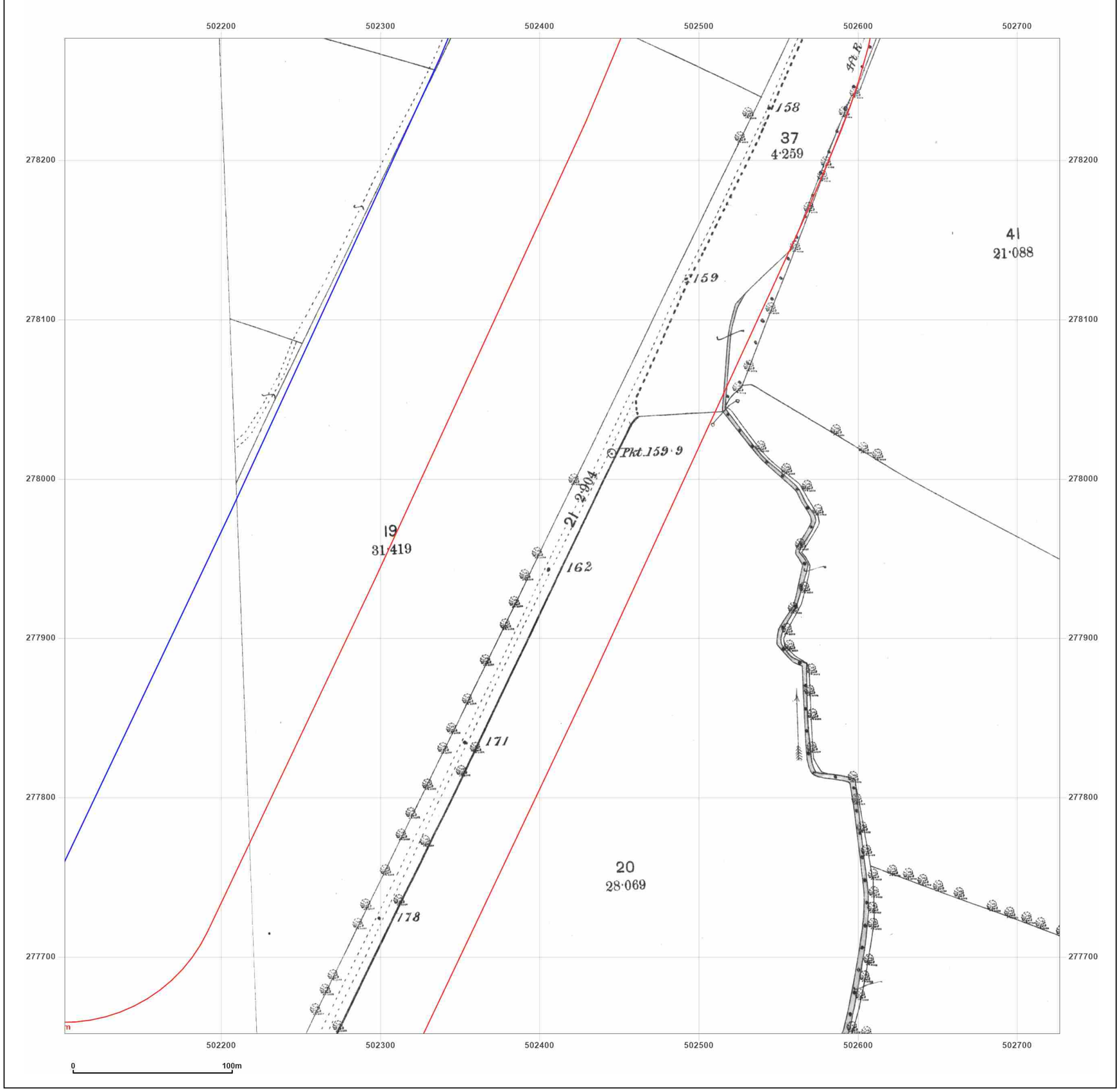


Groundsure INSIGHTS

Site Details:

501767, 278467

Client Ref: C-18443-_Sophie_
Report Ref: GS-7926026_LS_3_1
Grid Ref: 502414, 277964

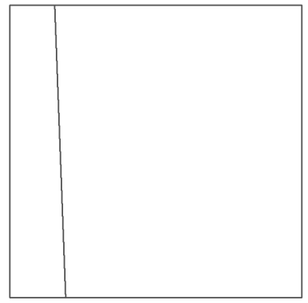
Map Name: County Series

Map date: **1889**

Scale: 1:2,500

Printed at: 1:2,500

N
W E
S



Surveyed 1889
Revised 1889
Edition N/A
Copyright N/A
Levelled N/A

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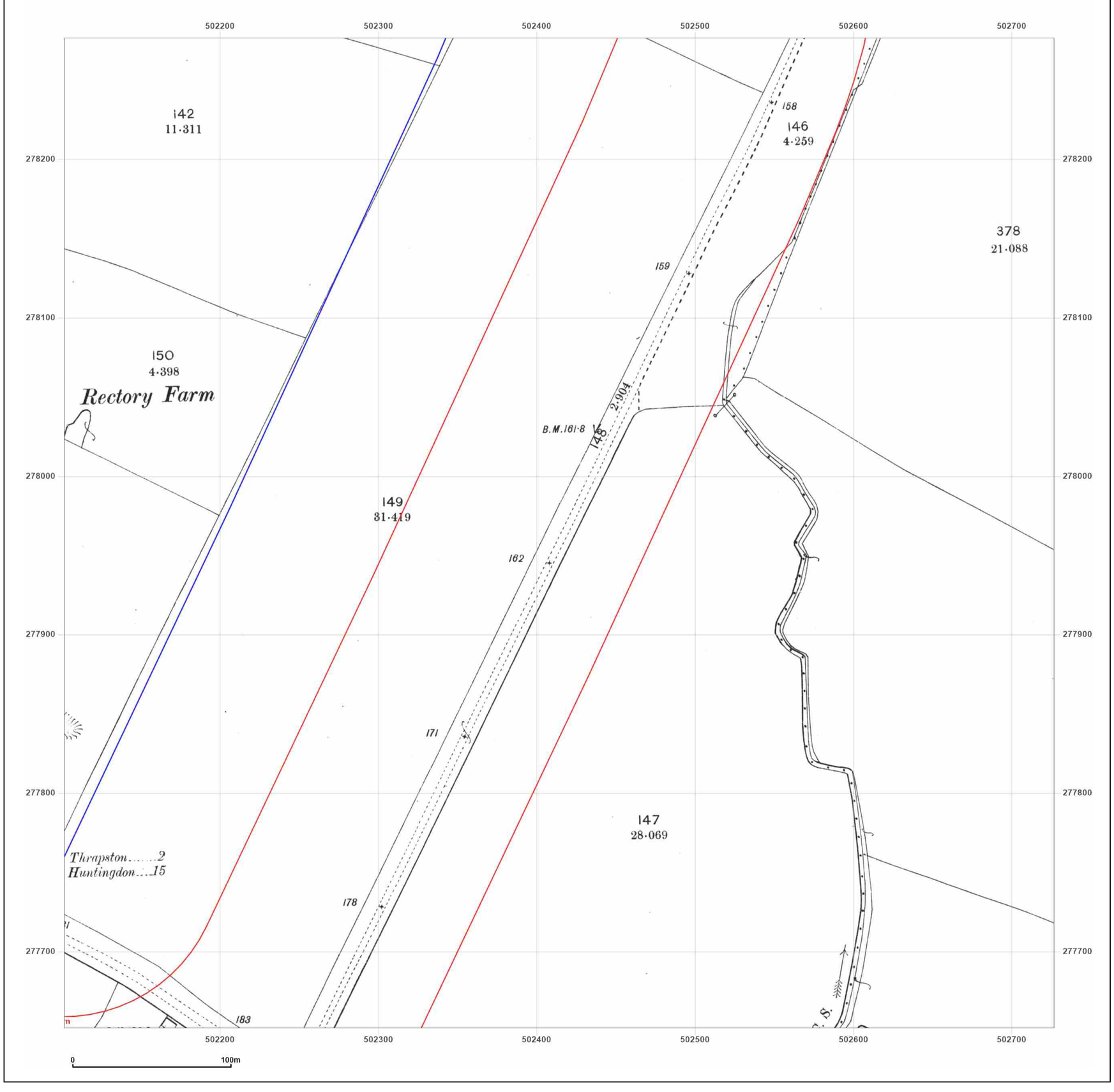

Groundsure INSIGHTS

Site Details:

501767, 278467

Client Ref: C-18443-_Sophie_
Report Ref: GS-7926026_LS_3_1
Grid Ref: 502414, 277964

Map Name: County Series

Map date: **1900**

Scale: 1:2,500

Printed at: 1:2,500

N
W E
S

Surveyed 1900
Revised 1900
Edition N/A
Copyright N/A
Levelled N/A

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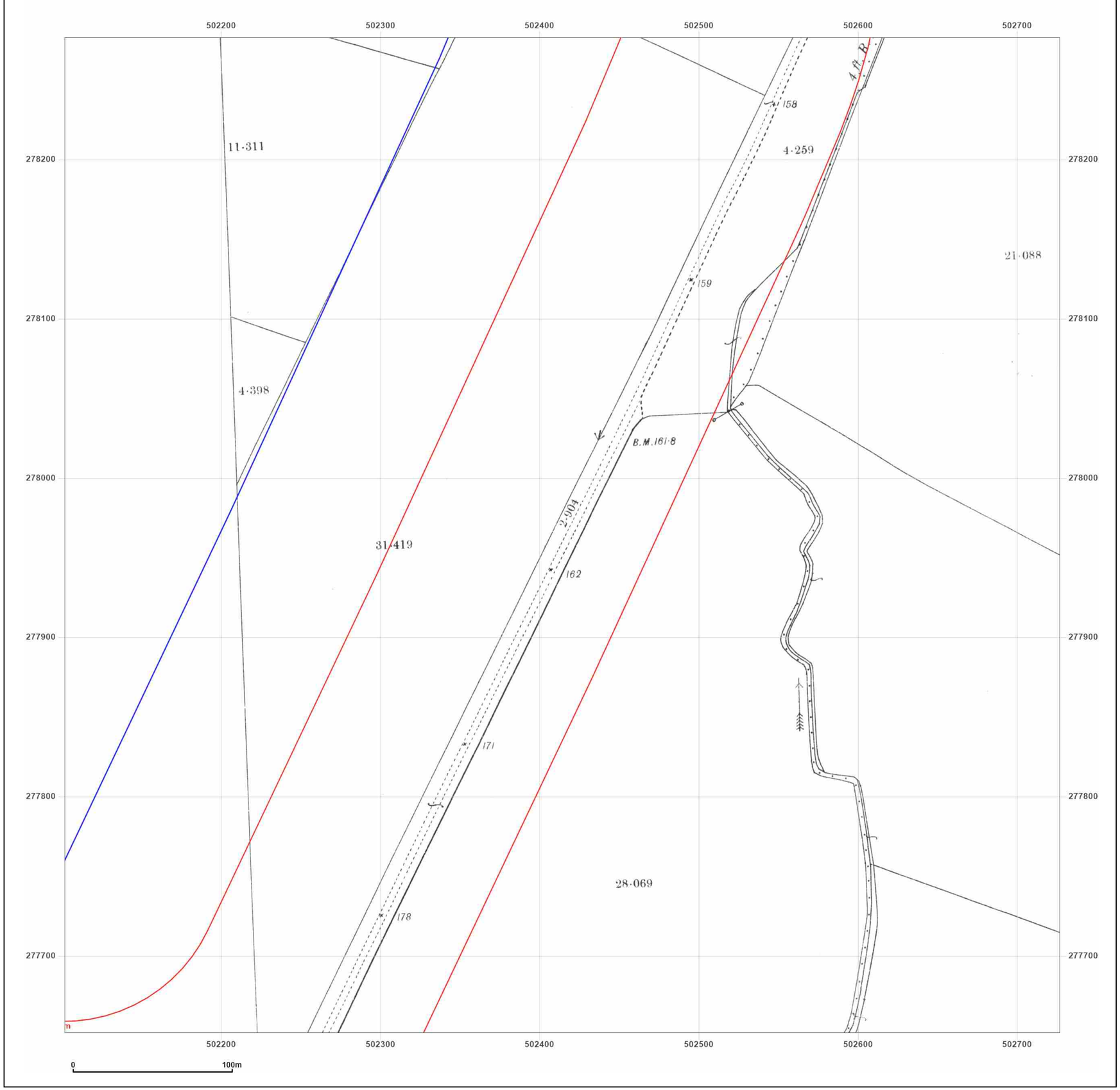


Groundsure INSIGHTS

Site Details:

501767, 278467

Client Ref: C-18443-_Sophie_
Report Ref: GS-7926026_LS_3_1
Grid Ref: 502414, 277964

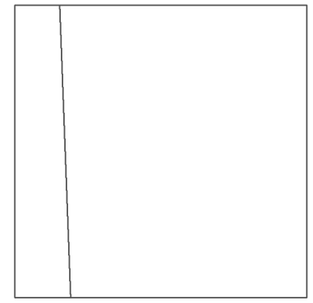
Map Name: County Series

Map date: **1901**

Scale: 1:2,500

Printed at: 1:2,500

N
W E
S



Surveyed 1901
Revised 1901
Edition N/A
Copyright N/A
Levelled N/A

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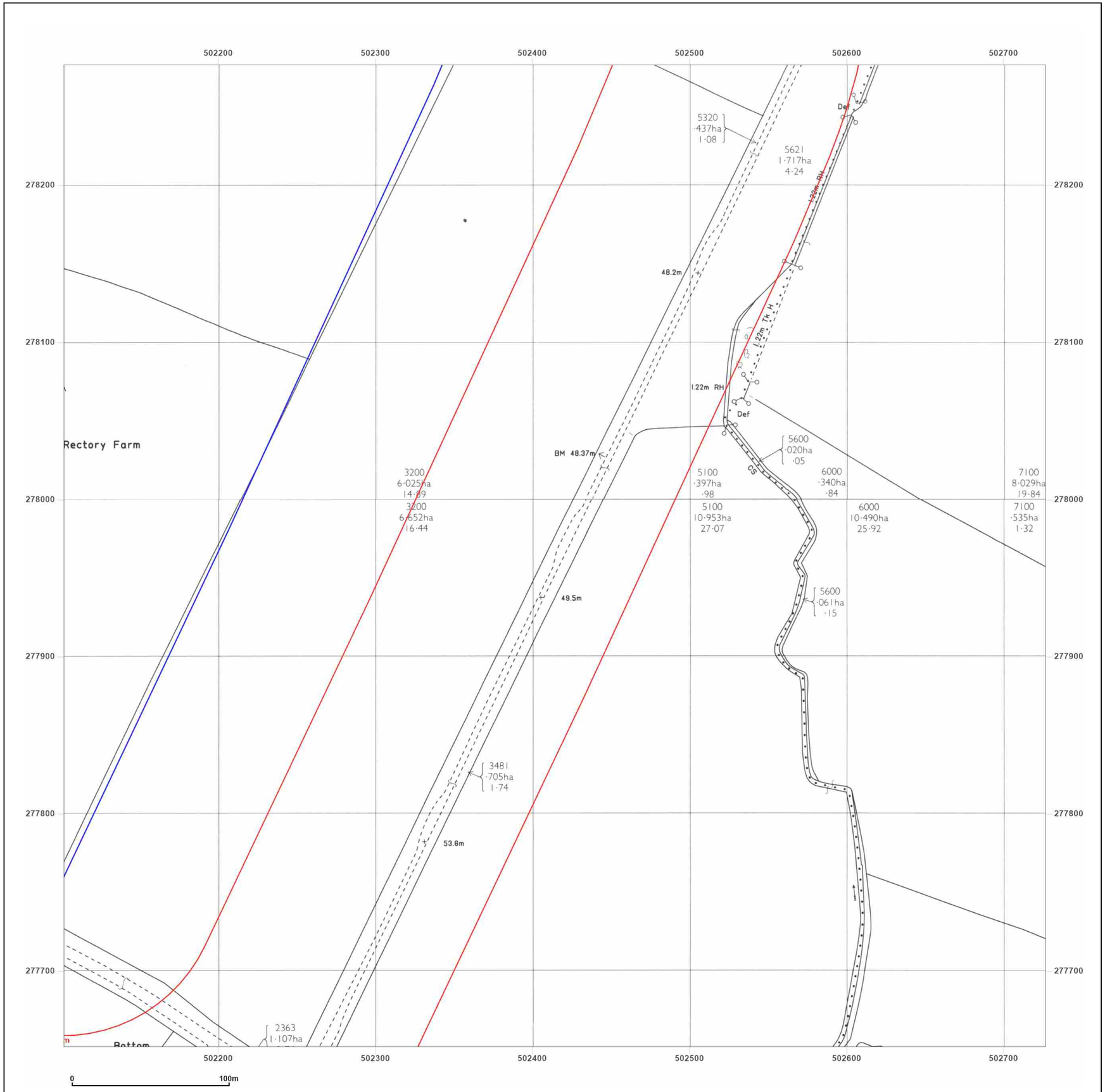

Groundsure INSIGHTS

Site Details:

501767, 278467

Client Ref: C-18443-_Sophie_
Report Ref: GS-7926026_LS_3_1
Grid Ref: 502414, 277964

Map Name: National Grid

Map date: **1974**

Scale: 1:2,500

Printed at: 1:2,500

N
W E
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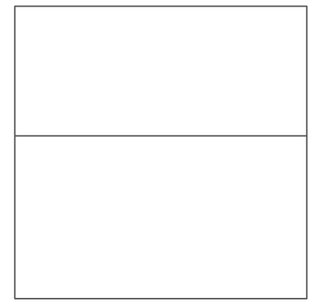
Surveyed 1974
Revised 1974
Edition N/A
Copyright 1975
Levelled 1966



Surveyed 1974
Revised 1974
Edition N/A
Copyright 1975
Levelled 1966

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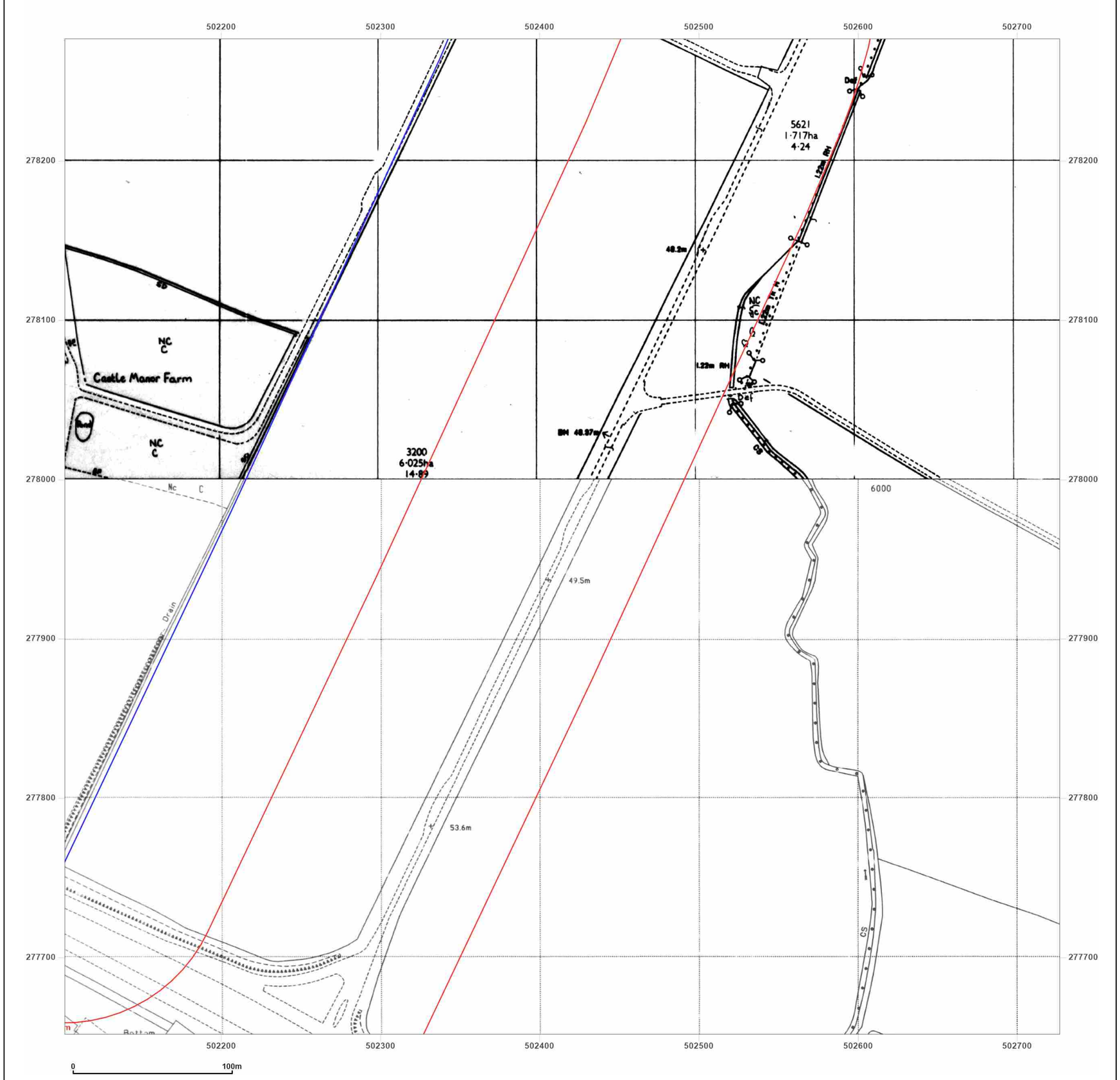

Groundsure INSIGHTS

Site Details:

501767, 278467

Client Ref: C-18443-_Sophie_
Report Ref: GS-7926026_LS_3_1
Grid Ref: 502414, 277964

Map Name: National Grid

Map date: **1992-1993**

Scale: 1:2,500

Printed at: 1:2,500

N
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S

Surveyed 1992
Revised 1992
Edition N/A
Copyright 1992
Levelled N/A

Surveyed 1993
Revised N/A
Edition N/A
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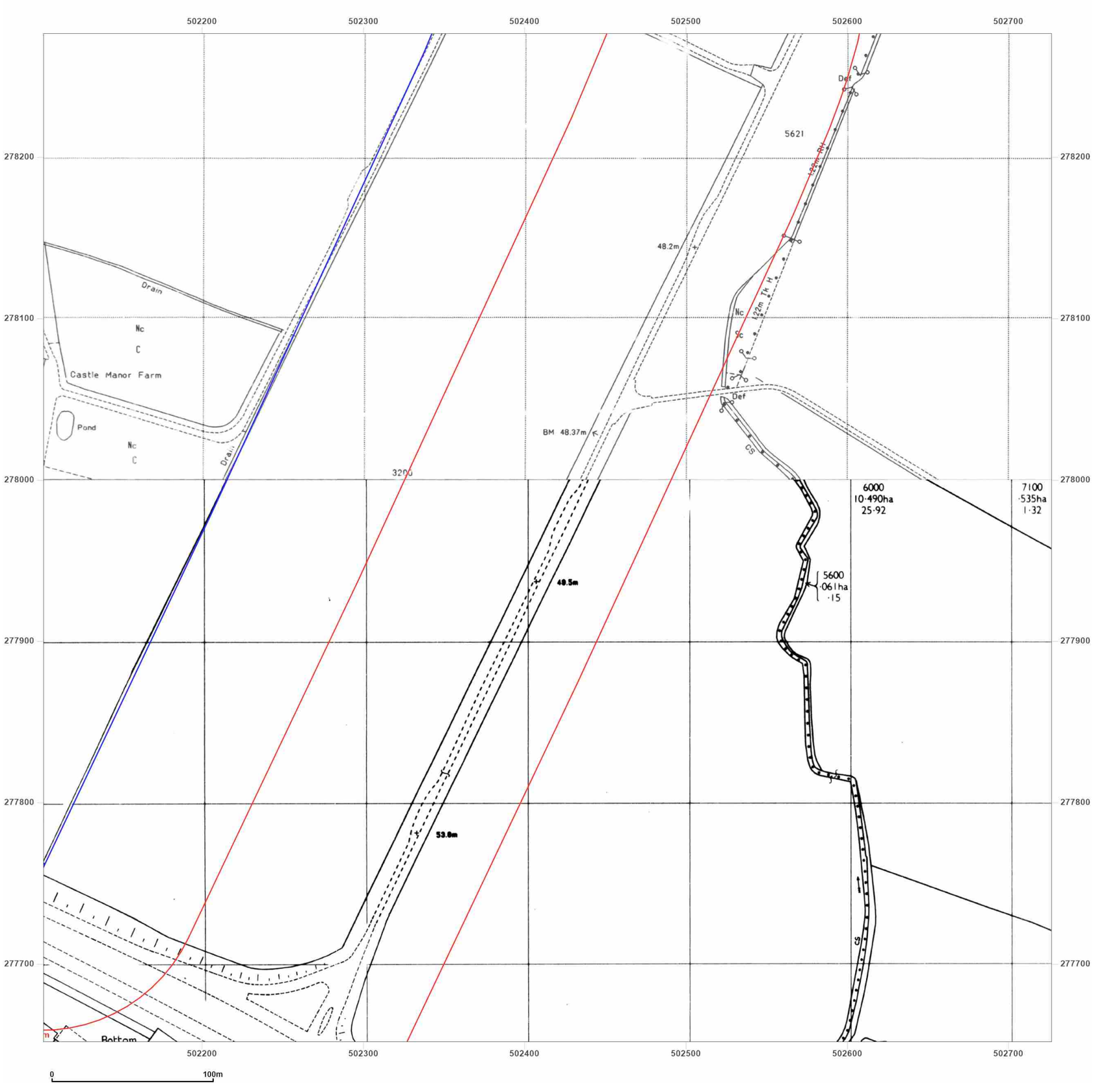

Groundsure INSIGHTS

Site Details:

501767, 278467

Client Ref: C-18443-_Sophie_
Report Ref: GS-7926026_LS_3_1
Grid Ref: 502414, 277964

Map Name: National Grid

Map date: **1991-1993**

Scale: 1:2,500

Printed at: 1:2,500

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Revised 1991
Edition N/A
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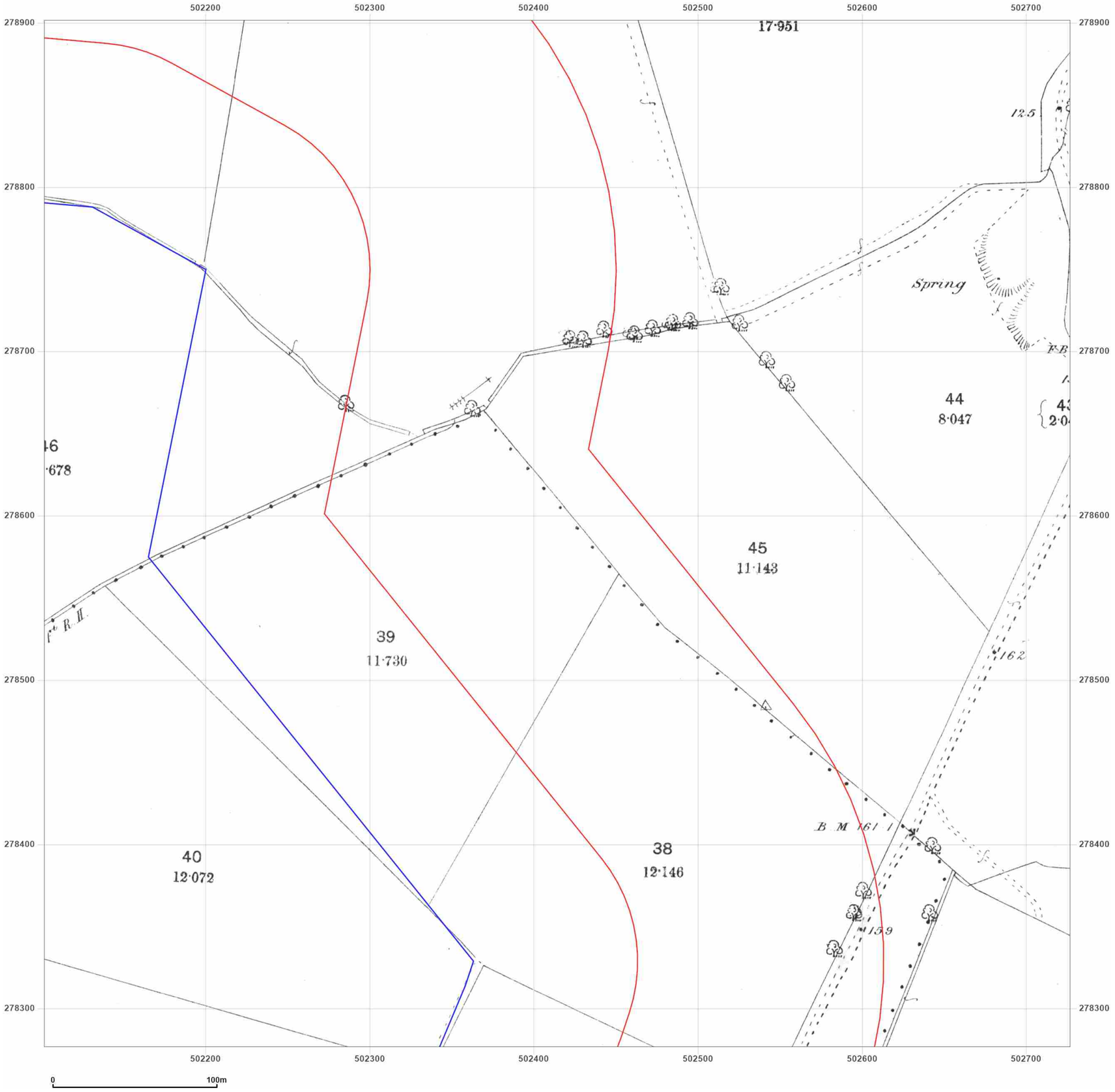

Groundsure INSIGHTS

Site Details:

501767, 278467

Client Ref: C-18443-_Sophie_
Report Ref: GS-7926026_LS_3_2
Grid Ref: 502414, 278589

Map Name: County Series

Map date: **1886**

Scale: 1:2,500

Printed at: 1:2,500

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Revised 1886
Edition N/A
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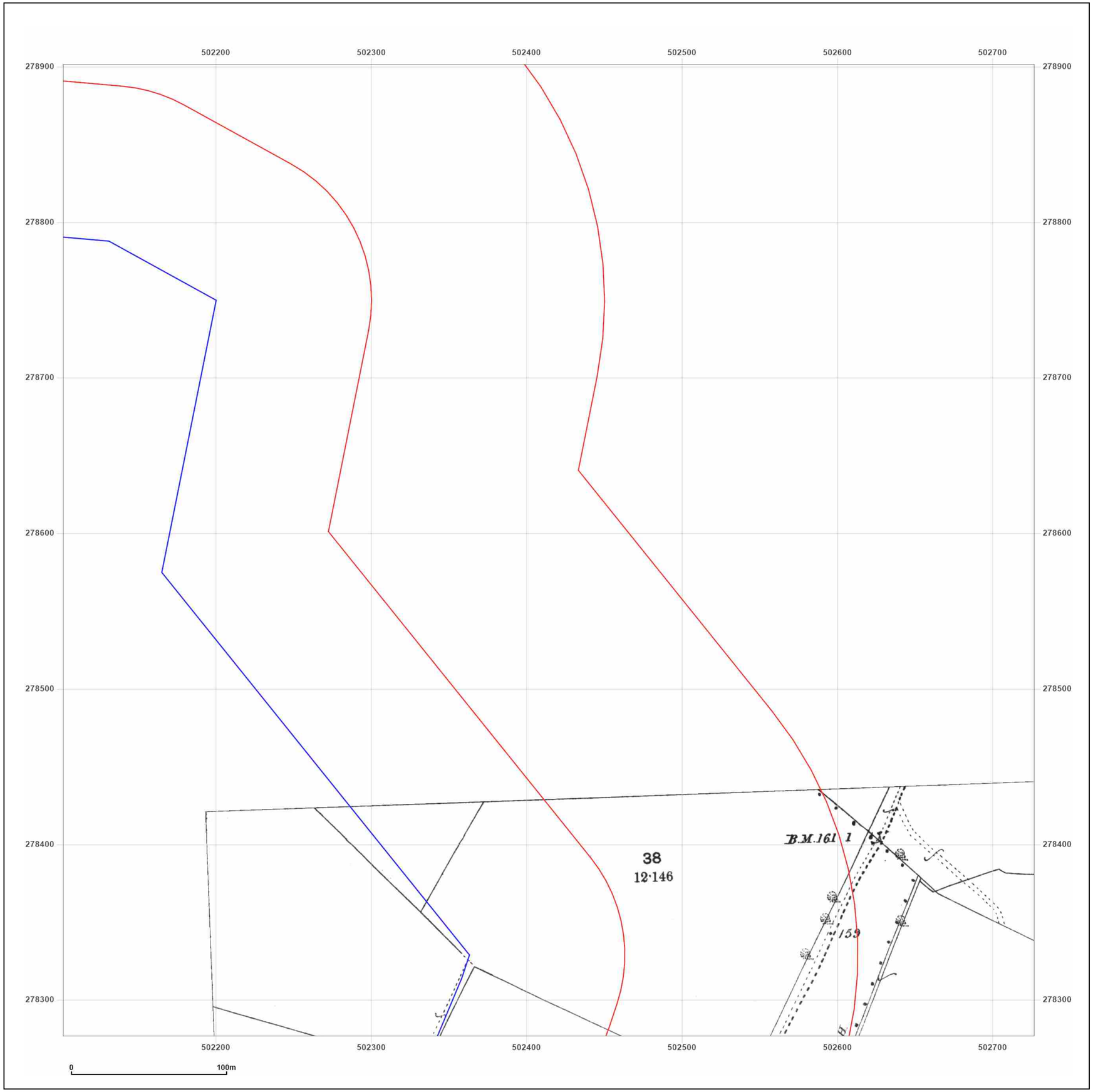

Groundsure INSIGHTS

Site Details:

501767, 278467

Client Ref: C-18443-_Sophie_
Report Ref: GS-7926026_LS_3_2
Grid Ref: 502414, 278589

Map Name: County Series

Map date: **1889**

Scale: 1:2,500

Printed at: 1:2,500

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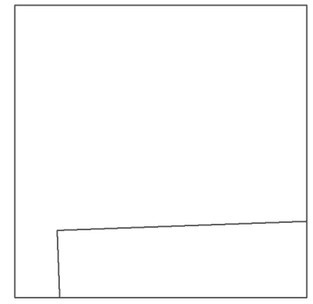

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Revised 1889
Edition N/A
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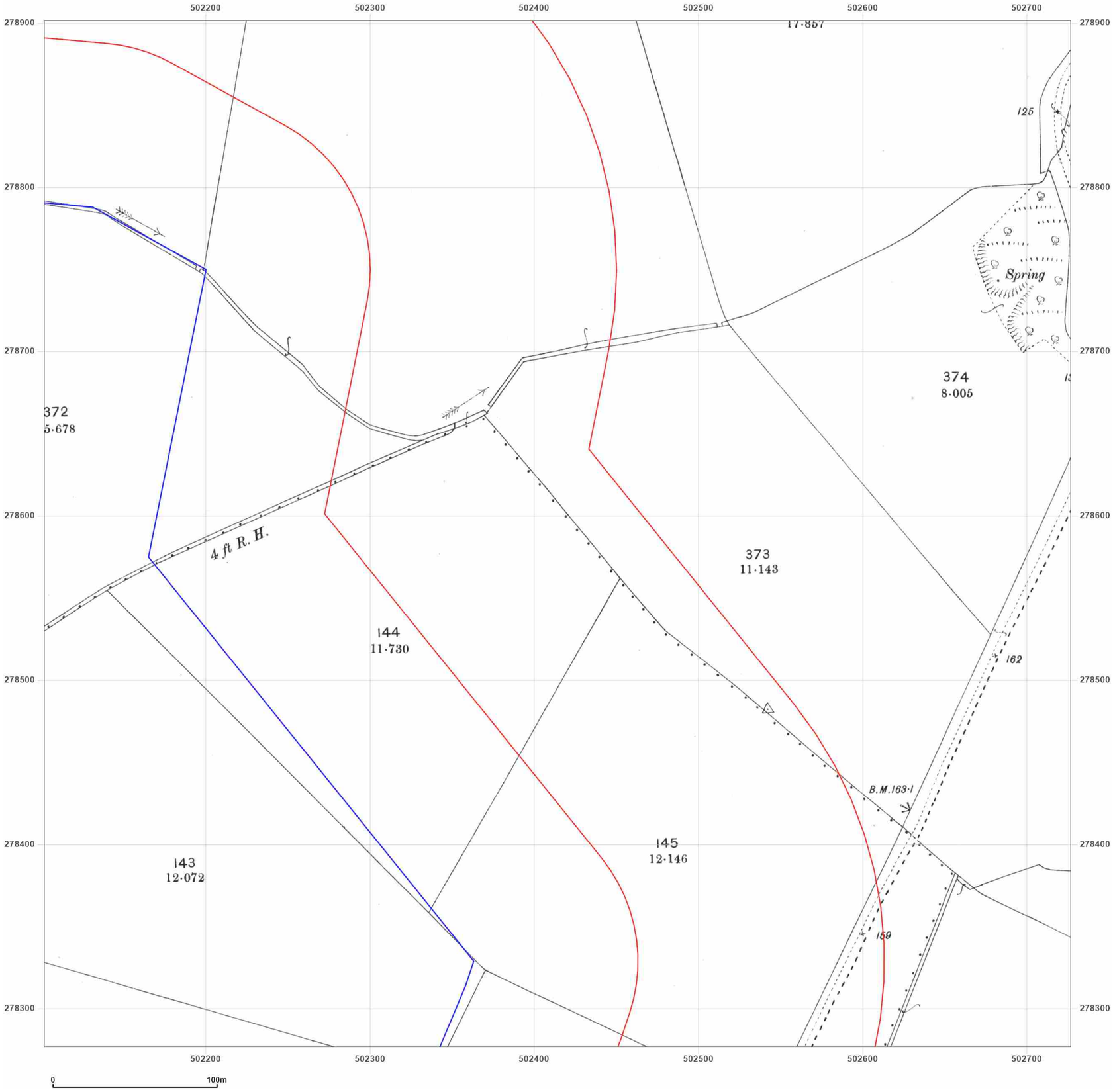

Groundsure INSIGHTS

Site Details:

501767, 278467

Client Ref: C-18443-_Sophie_
Report Ref: GS-7926026_LS_3_2
Grid Ref: 502414, 278589

Map Name: County Series

Map date: **1900**

Scale: 1:2,500

Printed at: 1:2,500

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Revised 1900
Edition N/A
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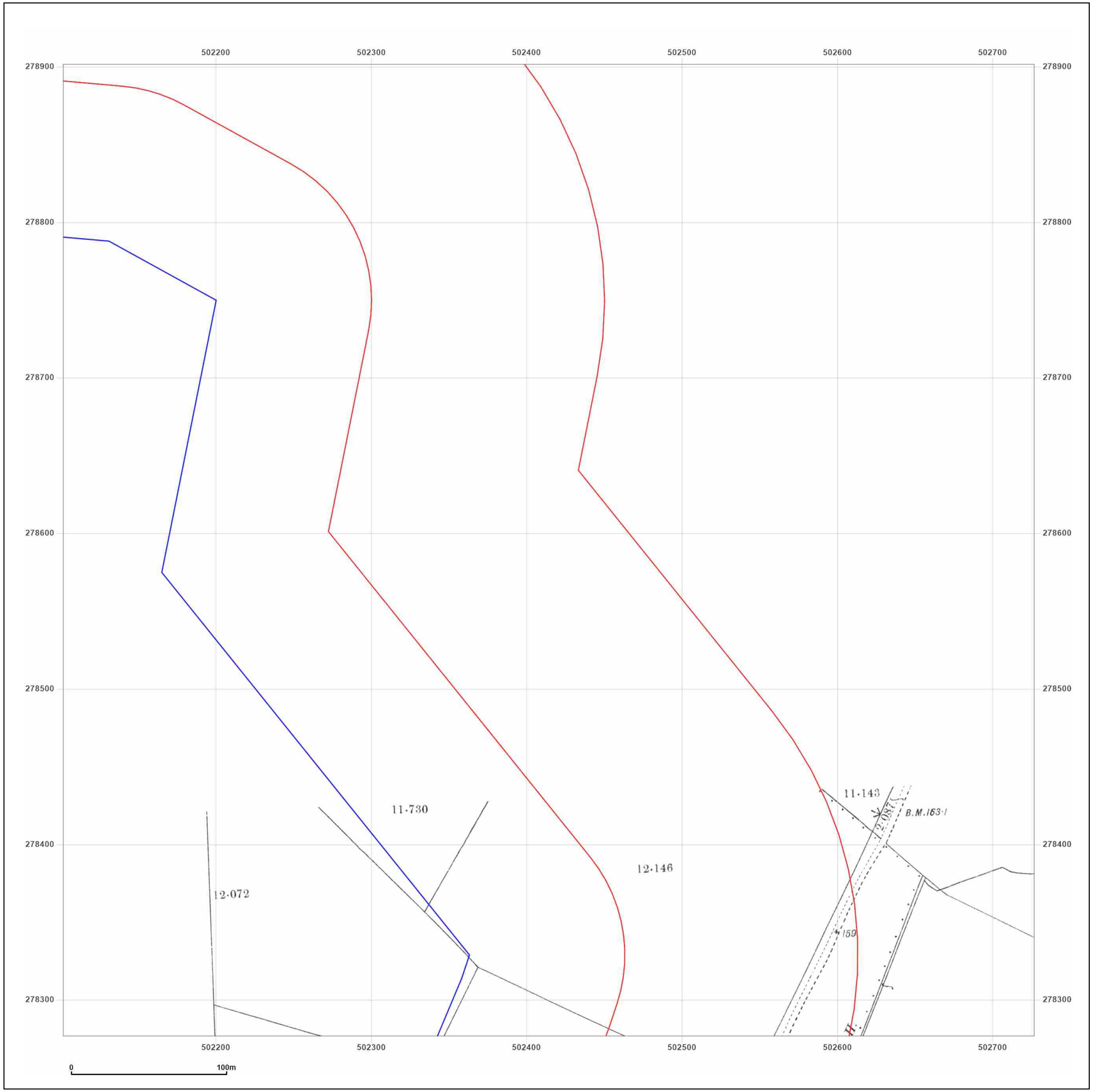

Groundsure INSIGHTS

Site Details:

501767, 278467

Client Ref: C-18443-_Sophie_
Report Ref: GS-7926026_LS_3_2
Grid Ref: 502414, 278589

Map Name: County Series

Map date: **1901**

Scale: 1:2,500

Printed at: 1:2,500

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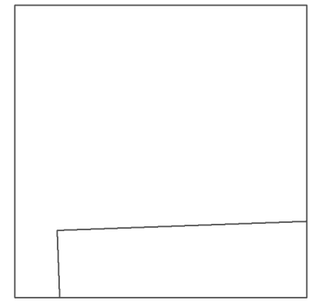

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Revised 1901
Edition N/A
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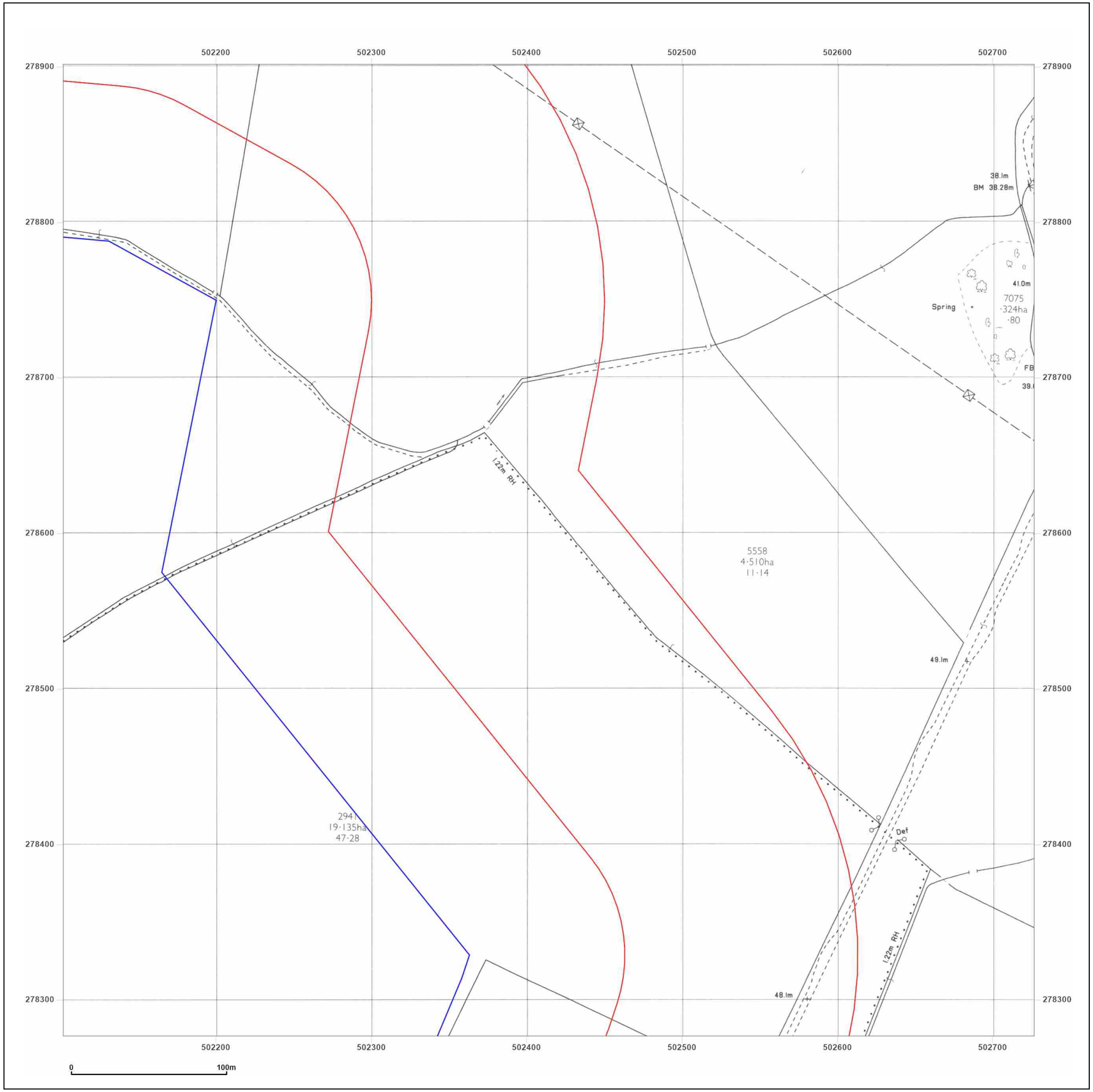

Groundsure INSIGHTS

Site Details:

501767, 278467

Client Ref: C-18443-_Sophie_
Report Ref: GS-7926026_LS_3_2
Grid Ref: 502414, 278589

Map Name: National Grid

Map date: **1974**

Scale: 1:2,500

Printed at: 1:2,500

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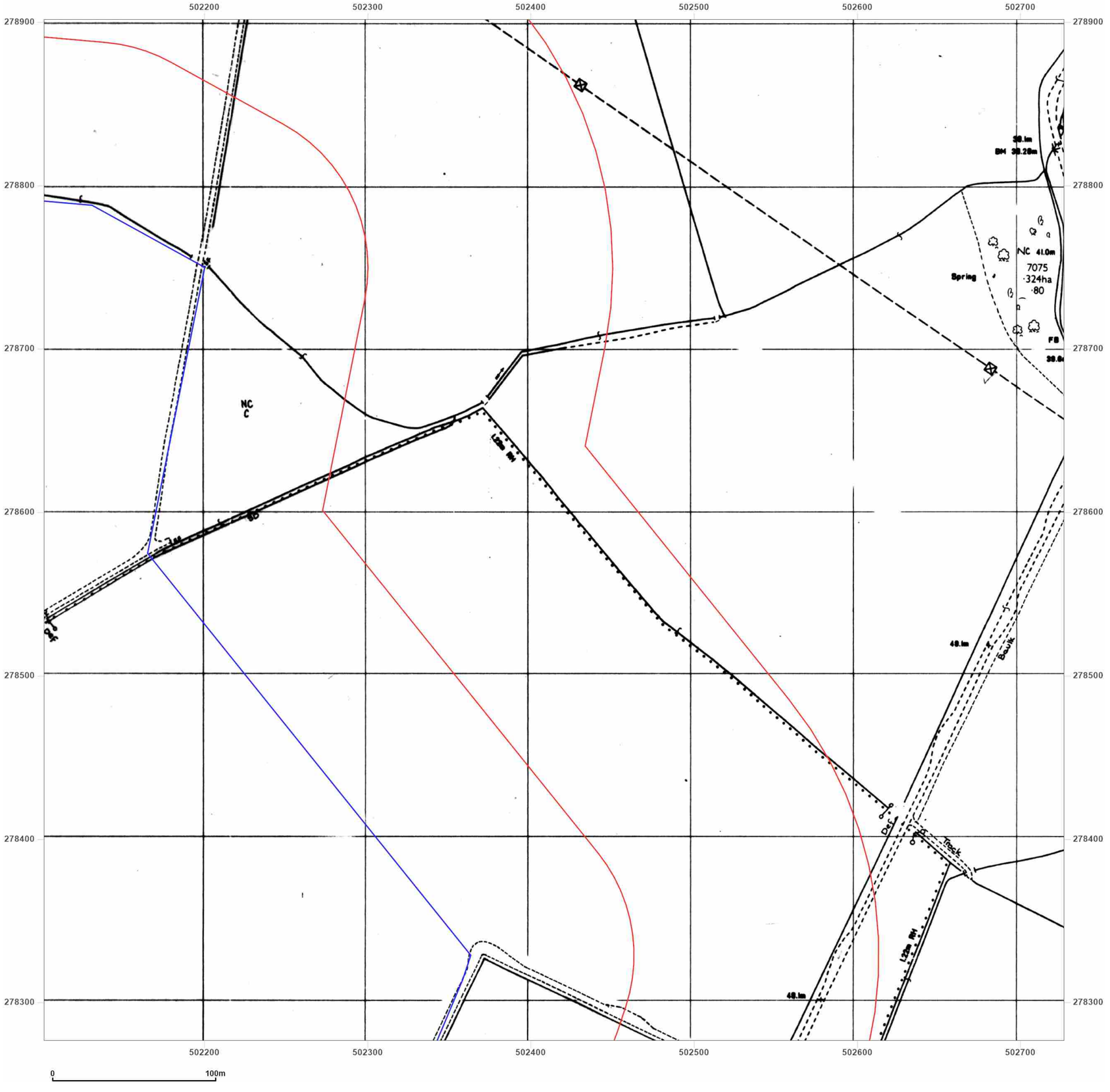

Groundsure INSIGHTS

Site Details:

501767, 278467

Client Ref: C-18443-_Sophie_
Report Ref: GS-7926026_LS_3_2
Grid Ref: 502414, 278589

Map Name: National Grid

Map date: **1992**

Scale: 1:2,500

Printed at: 1:2,500

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Revised 1992
Edition N/A
Copyright 1992
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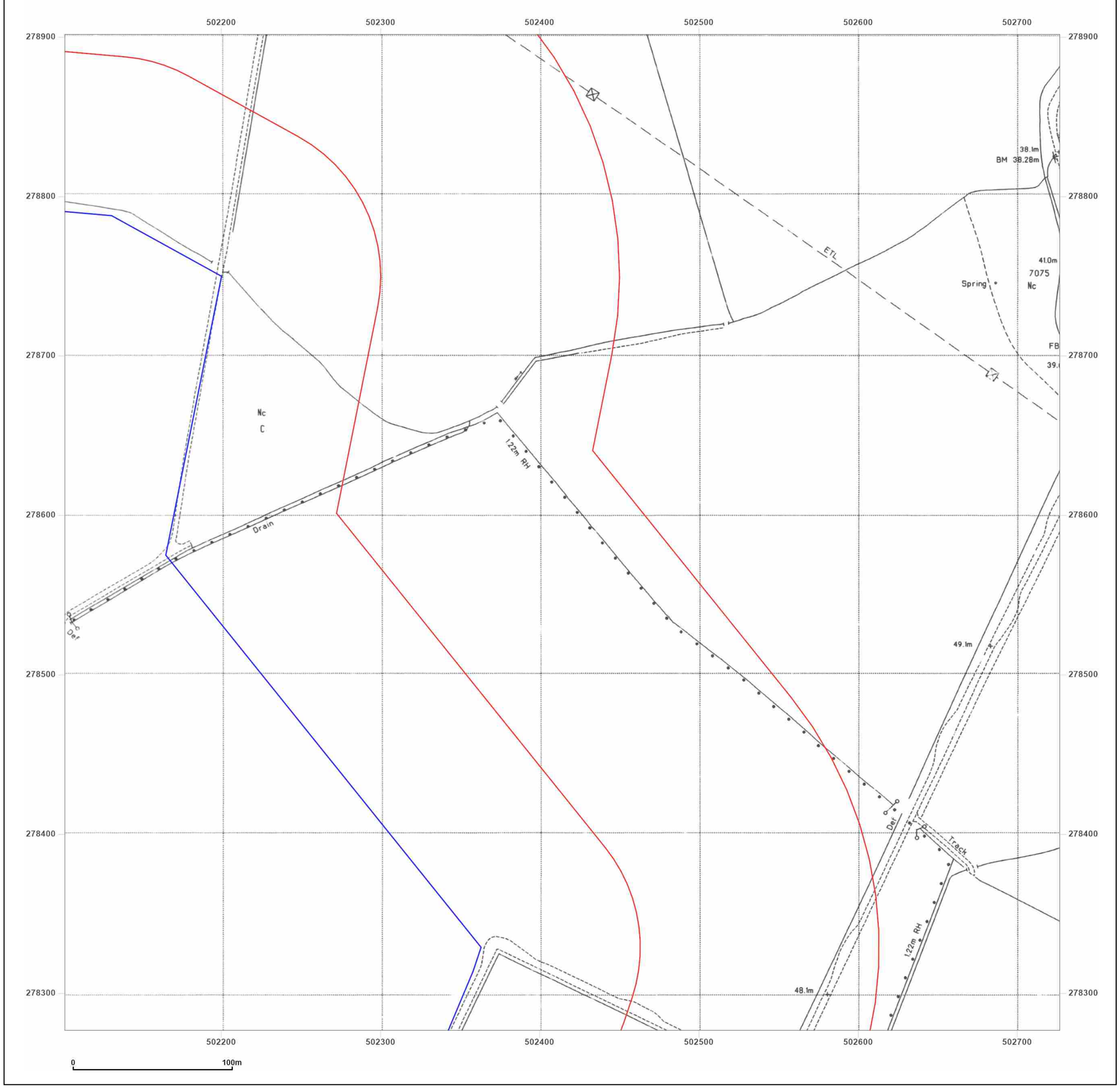

Groundsure INSIGHTS

Site Details:

501767, 278467

Client Ref: C-18443-_Sophie_
Report Ref: GS-7926026_LS_3_2
Grid Ref: 502414, 278589

Map Name: National Grid

Map date: **1993**

Scale: 1:2,500

Printed at: 1:2,500

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Surveyed 1993
Revised N/A
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Appendix D Desk Study Research Information

Groundsure Database Report

Groundsure LOCATION INTELLIGENCE

Enviro+Geo Insight

501767, 278467

Order Details

Date: 04/06/2021

Your ref: C-18443-_Sophie_

Our Ref: GS-7926027

Client: Hydrock Consultants Ltd

Site Details

Location: 501952 278444

Area: 71.19 ha

Authority: North Northamptonshire Council (East Northamptonshire Area)

Contact us with any questions at:
info@groundsure.com
08444 159 000

Summary of findings

Page	Section	Past land use	On site	0-50m	50-250m	250-500m	500-2000m
13	1.1	Historical industrial land uses	4	1	2	7	-
14	1.2	Historical tanks	0	0	1	3	-
15	1.3	Historical energy features	0	0	0	0	-
15	1.4	Historical petrol stations	0	0	0	0	-
15	1.5	Historical garages	0	0	0	0	-
15	1.6	Historical military land	0	0	0	0	-
Page	Section	Past land use - un-grouped	On site	0-50m	50-250m	250-500m	500-2000m
16	2.1	Historical industrial land uses	5	2	2	9	-
17	2.2	Historical tanks	0	0	2	5	-
18	2.3	Historical energy features	0	0	0	0	-
18	2.4	Historical petrol stations	0	0	0	0	-
18	2.5	Historical garages	0	0	0	0	-
Page	Section	Waste and landfill	On site	0-50m	50-250m	250-500m	500-2000m
19	3.1	Active or recent landfill	1	0	0	0	-
20	3.2	Historical landfill (BGS records)	0	0	0	0	-
20	3.3	Historical landfill (LA/mapping records)	0	0	0	0	-
20	3.4	Historical landfill (EA/NRW records)	1	0	0	0	-
20	3.5	Historical waste sites	0	0	0	0	-
21	3.6	Licensed waste sites	1	2	0	0	-
22	3.7	Waste exemptions	4	0	28	4	-
Page	Section	Current industrial land use	On site	0-50m	50-250m	250-500m	500-2000m
26	4.1	Recent industrial land uses	0	0	3	-	-
27	4.2	Current or recent petrol stations	0	0	0	0	-
27	4.3	Electricity cables	0	0	0	0	-
27	4.4	Gas pipelines	0	0	0	0	-
27	4.5	Sites determined as Contaminated Land	0	0	0	0	-

27	4.6	Control of Major Accident Hazards (COMAH)	0	0	0	0	-
28	4.7	Regulated explosive sites	0	0	0	0	-
28	**4.8**	**Hazardous substance storage/usage**	0	0	1	0	-
28	4.9	Historical licensed industrial activities (IPC)	0	0	0	0	-
28	**4.10**	**Licensed industrial activities (Part A(1))**	0	5	0	0	-
29	4.11	Licensed pollutant release (Part A(2)/B)	0	0	0	0	-
30	4.12	Radioactive Substance Authorisations	0	0	0	0	-
30	**4.13**	**Licensed Discharges to controlled waters**	2	0	0	0	-
30	4.14	Pollutant release to surface waters (Red List)	0	0	0	0	-
31	4.15	Pollutant release to public sewer	0	0	0	0	-
31	4.16	List 1 Dangerous Substances	0	0	0	0	-
31	**4.17**	**List 2 Dangerous Substances**	0	0	0	1	-
31	**4.18**	**Pollution Incidents (EA/NRW)**	0	0	2	1	-
32	4.19	Pollution inventory substances	0	0	0	0	-
32	4.20	Pollution inventory waste transfers	0	0	0	0	-
32	4.21	Pollution inventory radioactive waste	0	0	0	0	-

Page	Section	Hydrogeology	On site	0-50m	50-250m	250-500m	500-2000m
33	**5.1**	**Superficial aquifer**	Identified (within 500m)				
35	**5.2**	**Bedrock aquifer**	Identified (within 500m)				
37	**5.3**	**Groundwater vulnerability**	Identified (within 50m)				
42	**5.4**	**Groundwater vulnerability- soluble rock risk**	Identified (within 0m)				
43	5.5	Groundwater vulnerability- local information	None (within 0m)				
44	**5.6**	**Groundwater abstractions**	0	0	0	0	1
45	5.7	Surface water abstractions	0	0	0	0	0
45	5.8	Potable abstractions	0	0	0	0	0
45	5.9	Source Protection Zones	0	0	0	0	-
46	5.10	Source Protection Zones (confined aquifer)	0	0	0	0	-

Page	Section	Hydrology	On site	0-50m	50-250m	250-500m	500-2000m
47	**6.1**	**Water Network (OS MasterMap)**	1	1	5	-	-

48	6.2	Surface water features	1	2	5	-	-
48	6.3	WFD Surface water body catchments	2	-	-	-	-
49	6.4	WFD Surface water bodies	0	0	0	-	-
49	6.5	WFD Groundwater bodies	1	-	-	-	-
Page	Section	River and coastal flooding	On site	0-50m	50-250m	250-500m	500-2000m
51	7.1	Risk of Flooding from Rivers and Sea (RoFRaS)	None (within 50m)				
51	7.2	Historical Flood Events	0	0	0	-	-
51	7.3	Flood Defences	0	0	0	-	-
51	7.4	Areas Benefiting from Flood Defences	0	0	0	-	-
52	7.5	Flood Storage Areas	0	0	0	-	-
53	7.6	Flood Zone 2	None (within 50m)				
53	7.7	Flood Zone 3	None (within 50m)				
Page	Section	Surface water flooding					
54	8.1	Surface water flooding	1 in 30 year, Greater than 1.0m (within 50m)				
Page	Section	Groundwater flooding					
56	9.1	Groundwater flooding	Low (within 50m)				
Page	Section	Environmental designations	On site	0-50m	50-250m	250-500m	500-2000m
57	10.1	Sites of Special Scientific Interest (SSSI)	0	0	0	0	4
58	10.2	Conserved wetland sites (Ramsar sites)	0	0	0	0	2
59	10.3	Special Areas of Conservation (SAC)	0	0	0	0	0
59	10.4	Special Protection Areas (SPA)	0	0	0	0	4
60	10.5	National Nature Reserves (NNR)	0	0	0	0	0
60	10.6	Local Nature Reserves (LNR)	0	0	0	0	1
61	10.7	Designated Ancient Woodland	0	0	0	0	0
61	10.8	Biosphere Reserves	0	0	0	0	0
61	10.9	Forest Parks	0	0	0	0	0
61	10.10	Marine Conservation Zones	0	0	0	0	0
62	10.11	Green Belt	0	0	0	0	0
62	10.12	Proposed Ramsar sites	0	0	0	0	0

62	10.13	Possible Special Areas of Conservation (pSAC)	0	0	0	0	0
62	10.14	Potential Special Protection Areas (pSPA)	0	0	0	0	0
62	10.15	Nitrate Sensitive Areas	0	0	0	0	0
63	**10.16**	**Nitrate Vulnerable Zones**	2	1	0	0	4
64	**10.17**	**SSSI Impact Risk Zones**	3	-	-	-	-
66	**10.18**	**SSSI Units**	0	0	0	0	4
Page	Section	Visual and cultural designations	On site	0-50m	50-250m	250-500m	500-2000m
69	11.1	World Heritage Sites	0	0	0	-	-
69	11.2	Area of Outstanding Natural Beauty	0	0	0	-	-
69	11.3	National Parks	0	0	0	-	-
69	11.4	Listed Buildings	0	0	0	-	-
70	11.5	Conservation Areas	0	0	0	-	-
70	11.6	Scheduled Ancient Monuments	0	0	0	-	-
70	11.7	Registered Parks and Gardens	0	0	0	-	-
Page	Section	Agricultural designations	On site	0-50m	50-250m	250-500m	500-2000m
71	**12.1**	**Agricultural Land Classification**	Grade 3 (within 250m)				
72	12.2	Open Access Land	0	0	0	-	-
72	12.3	Tree Felling Licences	0	0	0	-	-
73	**12.4**	**Environmental Stewardship Schemes**	1	2	0	-	-
73	**12.5**	**Countryside Stewardship Schemes**	0	2	2	-	-
Page	Section	Habitat designations	On site	0-50m	50-250m	250-500m	500-2000m
74	13.1	Priority Habitat Inventory	0	0	0	-	-
74	13.2	Habitat Networks	0	0	0	-	-
74	13.3	Open Mosaic Habitat	0	0	0	-	-
74	13.4	Limestone Pavement Orders	0	0	0	-	-
Page	Section	Geology 1:10,000 scale	On site	0-50m	50-250m	250-500m	500-2000m
75	**14.1**	**10k Availability**	Identified (within 500m)				
76	**14.2**	**Artificial and made ground (10k)**	2	1	0	3	-
78	**14.3**	**Superficial geology (10k)**	2	0	1	0	-

79	14.4	Landslip (10k)	0	0	0	0	-
80	14.5	Bedrock geology (10k)	8	1	3	7	-
81	14.6	Bedrock faults and other linear features (10k)	1	0	0	2	-
Page	Section	Geology 1:50,000 scale	On site	0-50m	50-250m	250-500m	500-2000m
82	15.1	50k Availability	Identified (within 500m)				
83	15.2	Artificial and made ground (50k)	0	0	0	0	-
83	15.3	Artificial ground permeability (50k)	0	0	-	-	-
84	15.4	Superficial geology (50k)	2	0	1	0	-
85	15.5	Superficial permeability (50k)	Identified (within 50m)				
85	15.6	Landslip (50k)	0	0	0	0	-
85	15.7	Landslip permeability (50k)	None (within 50m)				
86	15.8	Bedrock geology (50k)	10	1	2	8	-
87	15.9	Bedrock permeability (50k)	Identified (within 50m)				
88	15.10	Bedrock faults and other linear features (50k)	1	0	0	0	-
Page	Section	Boreholes	On site	0-50m	50-250m	250-500m	500-2000m
89	16.1	BGS Boreholes	2	3	9	-	-
Page	Section	Natural ground subsidence					
91	17.1	Shrink swell clays	Moderate (within 50m)				
93	17.2	Running sands	Low (within 50m)				
95	17.3	Compressible deposits	Negligible (within 50m)				
96	17.4	Collapsible deposits	Very low (within 50m)				
97	17.5	Landslides	Very low (within 50m)				
98	17.6	Ground dissolution of soluble rocks	Very low (within 50m)				
Page	Section	Mining, ground workings and natural cavities	On site	0-50m	50-250m	250-500m	500-2000m
100	18.1	Natural cavities	0	0	0	0	-
101	18.2	BritPits	2	0	0	0	-
101	18.3	Surface ground workings	5	0	4	-	-
102	18.4	Underground workings	0	0	0	0	0
102	18.5	Historical Mineral Planning Areas	0	0	0	0	-

102	18.6	Non-coal mining	0	0	0	0	0
102	18.7	Mining cavities	0	0	0	0	0
103	18.8	JPB mining areas	None (within 0m)				
103	18.9	Coal mining	None (within 0m)				
103	18.10	Brine areas	None (within 0m)				
103	18.11	Gypsum areas	None (within 0m)				
103	18.12	Tin mining	None (within 0m)				
104	18.13	Clay mining	None (within 0m)				

Page	Section	Radon	
105	**19.1**	**Radon**	Less than 1% (within 0m)

Page	Section	Soil chemistry	On site	0-50m	50-250m	250-500m	500-2000m
106	**20.1**	**BGS Estimated Background Soil Chemistry**	47	13	-	-	-
109	20.2	BGS Estimated Urban Soil Chemistry	0	0	-	-	-
110	20.3	BGS Measured Urban Soil Chemistry	0	0	-	-	-

Page	Section	Railway infrastructure and projects	On site	0-50m	50-250m	250-500m	500-2000m
111	21.1	Underground railways (London)	0	0	0	-	-
111	21.2	Underground railways (Non-London)	0	0	0	-	-
111	21.3	Railway tunnels	0	0	0	-	-
111	21.4	Historical railway and tunnel features	0	0	0	-	-
111	21.5	Royal Mail tunnels	0	0	0	-	-
112	21.6	Historical railways	0	0	0	-	-
112	21.7	Railways	0	0	0	-	-
112	21.8	Crossrail 1	0	0	0	0	-
112	21.9	Crossrail 2	0	0	0	0	-
112	21.10	HS2	0	0	0	0	-

Recent aerial photograph

Capture Date: 15/07/2018

Site Area: 71.19ha

Recent site history - 2016 aerial photograph

Capture Date: 08/05/2016

Site Area: 71.19ha

Recent site history - 2011 aerial photograph

Capture Date: 29/09/2011

Site Area: 71.19ha

Recent site history - 2006 aerial photograph

Capture Date: 12/07/2006

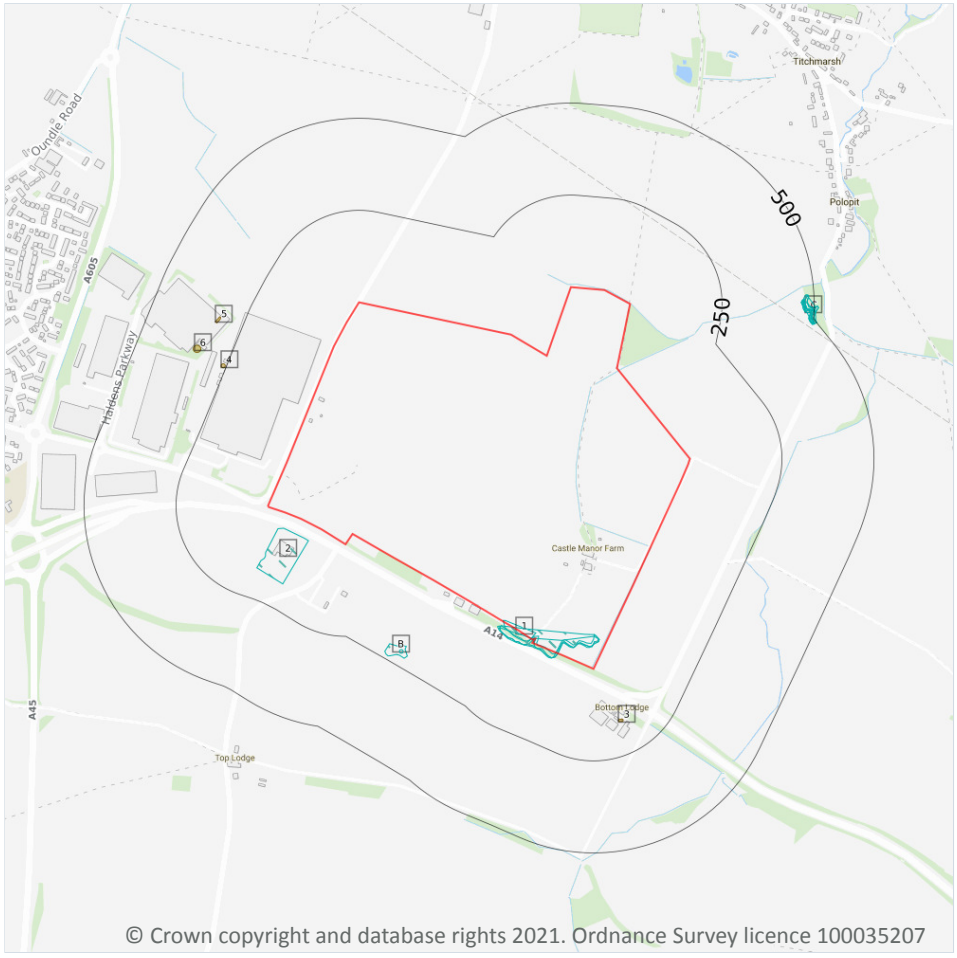
Site Area: 71.19ha

Recent site history - 1999 aerial photograph

Capture Date: 23/07/1999

Site Area: 71.19ha

1 Past land use



Site Outline

Search buffers in metres (m)

Historical industrial land uses

Historical tanks

1.1 Historical industrial land uses

Records within 500m	14

Potentially contaminative land use features digitised from historical Ordnance Survey mapping at 1:10,000 and 1:10,560 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use map on **page 13**

ID	Location	Land use	Dates present	Group ID
1	**On site**	**Unspecified Pit**	**1982**	**2041091**

ID	Location	Land use	Dates present	Group ID
A	**On site**	**Unspecified Ground Workings**	**1885**	**2060297**
A	**On site**	**Old Stone Pits**	**1901 - 1950**	**2078945**
A	**On site**	**Old Stone Pits**	**1951**	**2108453**
2	41m S	Unspecified Depot	1982 - 1994	2101829
B	193m SW	Disused Sewage Works	1950	2056198
B	206m SW	Unspecified Tank	1950	2044116
C	465m E	Unspecified Ground Workings	1950	2068426
C	465m E	Unspecified Ground Workings	1899	2082529
C	468m E	Unspecified Pits	1901	2072415
C	470m E	Unspecified Pits	1951	2078161
C	471m E	Unspecified Ground Workings	1887	2080493
C	474m E	Unspecified Ground Workings	1950	2072890
C	474m E	Unspecified Ground Workings	1885	2078744

This data is sourced from Ordnance Survey / Groundsure.

1.2 Historical tanks

Records within 500m	**4**

Tank features digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use map on **page 13**

ID	Location	Land use	Dates present	Group ID
3	154m SE	Tanks	1991 - 1993	356521
4	253m W	Unspecified Tank	1999	343631
5	314m W	Tanks	1997 - 1999	357787
6	332m W	Unspecified Tank	1997 - 1999	354092

This data is sourced from Ordnance Survey / Groundsure.

1.3 Historical energy features

Records within 500m	0

Energy features digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

This data is sourced from Ordnance Survey / Groundsure.

1.4 Historical petrol stations

Records within 500m	0

Petrol stations digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

This data is sourced from Ordnance Survey / Groundsure.

1.5 Historical garages

Records within 500m	0

Garages digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

This data is sourced from Ordnance Survey / Groundsure.

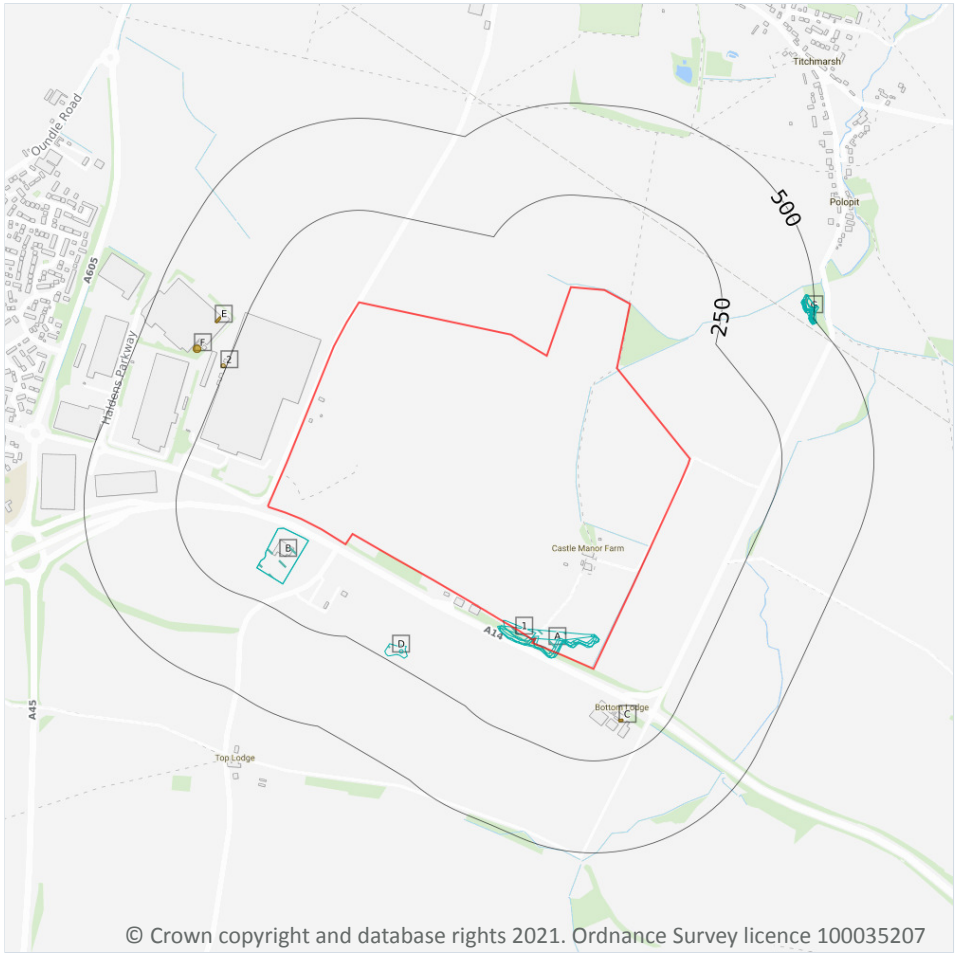
1.6 Historical military land

Records within 500m	0

Areas of military land digitised from multiple sources including the National Archives, local records, MOD records and verified other sources, intelligently grouped into contiguous features.

This data is sourced from Ordnance Survey / Groundsure / other sources.

2 Past land use - un-grouped



Site Outline

Search buffers in metres (m)

Historical industrial land uses

Historical tanks

2.1 Historical industrial land uses

Records within 500m	18

Potentially contaminative land use features digitised from historical Ordnance Survey mapping at 1:10,000 and 10,560 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use - un-grouped map on **page 16**

ID	Location	Land Use	Date	Group ID
1	**On site**	**Unspecified Pit**	**1982**	**2041091**
A	**On site**	**Old Stone Pits**	**1950**	**2078945**
A	**On site**	**Old Stone Pits**	**1951**	**2108453**

ID	Location	Land Use	Date	Group ID
A	**On site**	**Unspecified Ground Workings**	**1885**	**2060297**
A	**On site**	**Old Stone Pits**	**1901**	**2078945**
B	41m S	Unspecified Depot	1994	2101829
B	41m S	Unspecified Depot	1982	2101829
D	193m SW	Disused Sewage Works	1950	2056198
D	206m SW	Unspecified Tank	1950	2044116
G	465m E	Unspecified Ground Workings	1950	2068426
G	465m E	Unspecified Ground Workings	1899	2082529
G	468m E	Unspecified Pits	1901	2072415
G	468m E	Unspecified Pits	1901	2072415
G	470m E	Unspecified Pits	1951	2078161
G	471m E	Unspecified Ground Workings	1887	2080493
G	471m E	Unspecified Ground Workings	1887	2080493
G	474m E	Unspecified Ground Workings	1950	2072890
G	474m E	Unspecified Ground Workings	1885	2078744

This data is sourced from Ordnance Survey / Groundsure.

2.2 Historical tanks

Records within 500m **7**

Tank features digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use - un-grouped map on **page 16**

ID	Location	Land Use	Date	Group ID
C	154m SE	Tanks	1991	356521
C	154m SE	Tanks	1993	356521
2	253m W	Unspecified Tank	1999	343631
E	314m W	Tanks	1997	357787
E	314m W	Tanks	1999	357787

ID	Location	Land Use	Date	Group ID
F	332m W	Unspecified Tank	1997	354092
F	332m W	Unspecified Tank	1999	354092

This data is sourced from Ordnance Survey / Groundsure.

2.3 Historical energy features

Records within 500m	0

Energy features digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

This data is sourced from Ordnance Survey / Groundsure.

2.4 Historical petrol stations

Records within 500m	0

Petrol stations digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

This data is sourced from Ordnance Survey / Groundsure.

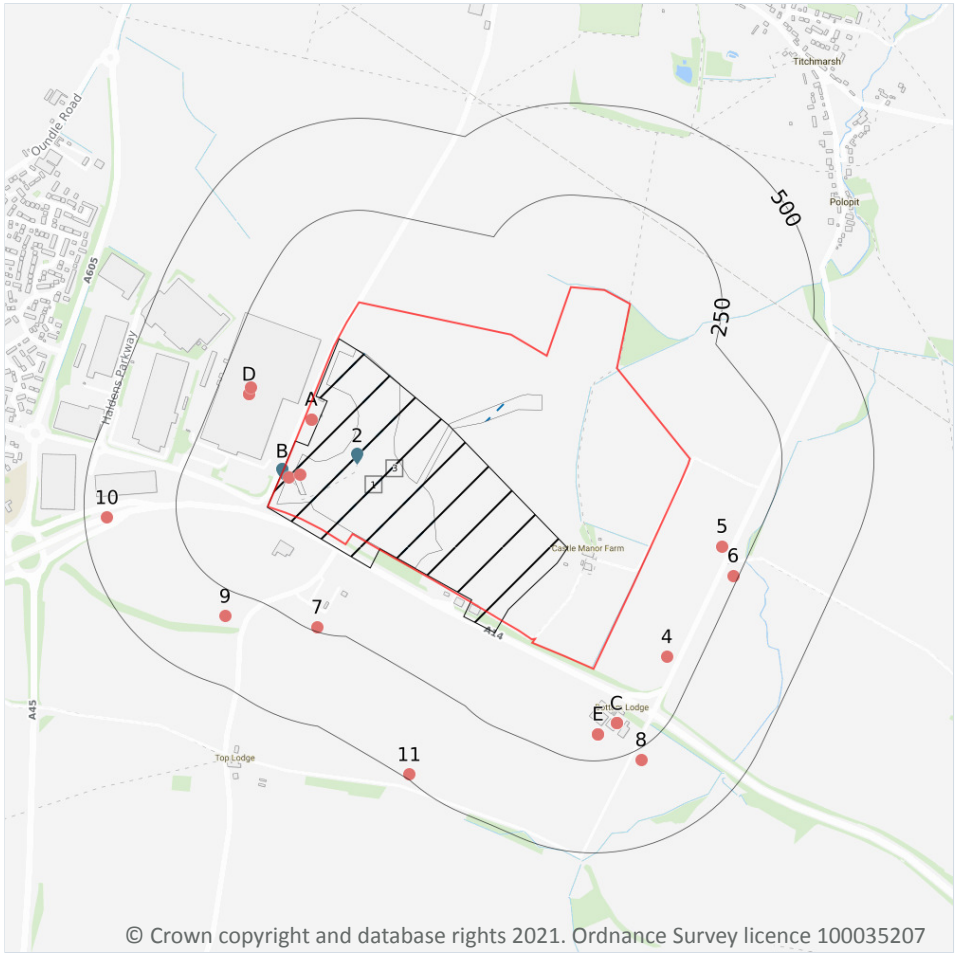
2.5 Historical garages

Records within 500m	0

Garages digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

This data is sourced from Ordnance Survey / Groundsure.

3 Waste and landfill



Site Outline

Search buffers in metres (m)

Active or recent landfill

Historical landfill (EA/NRW)

Licensed waste sites

Waste exemptions

3.1 Active or recent landfill

Records within 500m	1

Active or recently closed landfill sites under Environment Agency/Natural Resources Wales regulation.

Features are displayed on the Waste and landfill map on **page 19**

ID	Location	Details	
1	**On site**	**Operator: Mick George (Haulage) Ltd** **Site Address: Titchmarsh Road, Thrapston, Northants, NN14 4NJ**	**WML Number: 73156** **EPR Reference: IPC005** **Landfill type: L05: Inert LF** **Status: Issued** **IPPC Reference: -** **EPR Number: EA/EPR/BT9879IY/V003**

This data is sourced from the Environment Agency and Natural Resources Wales.

3.2 Historical landfill (BGS records)

Records within 500m	0

Landfill sites identified on a survey carried out on behalf of the DoE in 1973. These sites may have been closed or operational at this time.

This data is sourced from the British Geological Survey.

3.3 Historical landfill (LA/mapping records)

Records within 500m	0

Landfill sites identified from Local Authority records and high detail historical mapping.

This data is sourced from the Ordnance Survey/Groundsure and Local Authority records.

3.4 Historical landfill (EA/NRW records)

Records within 500m	1

Known historical (closed) landfill sites (e.g. sites where there is no PPC permit or waste management licence currently in force). This includes sites that existed before the waste licensing regime and sites that have been licensed in the past but where a licence has been revoked, ceased to exist or surrendered and a certificate of completion has been issued.

Features are displayed on the Waste and landfill map on **page 19**

ID	Location	Details		
3	**On site**	**Site Address: Rectory Farm Quarry, Rectory Farm, Titchmarsh Road, Thrapston, Northamptonshire** **Licence Holder Address: -**	**Waste Licence: Yes** **Site Reference: E/053, BT9879** **Waste Type: Inert** **Environmental Permitting Regulations (Waste) Reference: -** **Licence Issue: 07/06/1991** **Licence Surrender: -**	**Operator: Peter Binnie Limited** **Licence Holder: Mick George Haulage Limited** **First Recorded 01/01/1992** **Last Recorded: -**

This data is sourced from the Environment Agency and Natural Resources Wales.

3.5 Historical waste sites

Records within 500m	0

Waste site records derived from Local Authority planning records and high detail historical mapping.

This data is sourced from Ordnance Survey/Groundsure and Local Authority records.

3.6 Licensed waste sites

Records within 500m	3

Active or recently closed waste sites under Environment Agency/Natural Resources Wales regulation.

Features are displayed on the Waste and landfill map on **page 19**

ID	Location	Details		
2	**On site**	**Site Name: Rectory Farm Quarry Site Address: Titchmarsh Road, Thrapston, Northants, NN14 4NJ Correspondence Address: -**	**Type of Site: Inert LF Size: >= 75000 tonnes Environmental Permitting Regulations (Waste) Licence Number: IPC005 EPR reference: EA/EPR/BT9879IY/V003 Operator: Mick George (Haulage) Ltd Waste Management licence No: 73156 Annual Tonnage: 75000**	**Issue Date: 05/07/2004 Effective Date: - Modified:: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Issued**
B	1m NW	Site Name: Rectory Farm Quarry Site Address: Rectory Farm Quarry, Titchmarsh Road, Thrapston, Northants, NN14 4NJ Correspondence Address: Second Drove, Meadow Lane, St Ives, Cambridgeshire, PE17 4YQ	Type of Site: Inert LF Size: >= 25000 tonnes 75000 tonnes Environmental Permitting Regulations (Waste) Licence Number: IPC005 EPR reference: EA/EPR/GP3092NZ/A001 Operator: Mick George (Haulage) Ltd Waste Management licence No: 73156 Annual Tonnage: 75000	Issue Date: 05/07/2004 Effective Date: - Modified:: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: -
B	1m NW	Site Name: Rectory Farm Quarry Site Address: Titchmarsh Road, Thrapston, Northants, NN14 4NJ Correspondence Address: -	Type of Site: Inert LF Size: >= 25000 tonnes 75000 tonnes Environmental Permitting Regulations (Waste) Licence Number: IPC005 EPR reference: EA/EPR/GP3092NZ/A001 Operator: Mick George (Haulage) Ltd Waste Management licence No: 73156 Annual Tonnage: 75000	Issue Date: 05/07/2004 Effective Date: - Modified:: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Issued

This data is sourced from the Environment Agency and Natural Resources Wales.

3.7 Waste exemptions

Records within 500m	36

Activities involving the storage, treatment, use or disposal of waste that are exempt from needing a permit. Exemptions have specific limits and conditions that must be adhered to.

Features are displayed on the Waste and landfill map on **page 19**

ID	Location	Site	Reference	Category	Sub-Category	Description
A	**On site**	**RECTORY FARM, THE BUNGALOW, HUNTINGDON ROAD, THRAPSTON, KETTERING, NN14 4NJ**	**WEX122076**	**Using waste exemption**	**On a farm**	**Use of waste in construction**
A	**On site**	**RECTORY FARM, THE BUNGALOW, HUNTINGDON ROAD, THRAPSTON, KETTERING, NN14 4NJ**	**WEX097446**	**Using waste exemption**	**On a farm**	**Use of waste in construction**
B	**On site**	**TYhrapston Landfill, Rectory Farm Titchmarsh Road Northamptonshire NN14 4NJ**	**EPR/KF0309UC/A001**	**Treating waste exemption**	**Non-Agricultural Waste Only**	**Screening and blending of waste**
B	**On site**	**Thrapston Landfill Rectory Farm Quarry Thrapston nn14 4nj**	**EPR/XF0209UQ/A001**	**Treating waste exemption**	**Non-Agricultural Waste Only**	**Treatment of waste wood and waste plant matter by chipping, shredding, cutting or pulverising**
C	162m SE	-	WEX170003	Using waste exemption	On a farm	Use of mulch
C	162m SE	-	WEX170003	Treating waste exemption	On a farm	Treatment of waste wood and waste plant matter by chipping, shredding, cutting or pulverising
C	162m SE	-	WEX170003	Treating waste exemption	On a farm	Preparatory treatments (baling, sorting, shredding etc)
C	162m SE	-	WEX170003	Disposing of waste exemption	On a farm	Deposit of waste from dredging of inland waters
C	162m SE	-	WEX170003	Using waste exemption	On a farm	Spreading of plant matter to confer benefit
C	162m SE	-	WEX170003	Disposing of waste exemption	On a farm	Disposal by incineration

ID	Location	Site	Reference	Category	Sub-Category	Description
C	162m SE	-	WEX170003	Treating waste exemption	On a farm	Treatment of waste in a biobed or biofilter
C	162m SE	-	WEX170003	Disposing of waste exemption	On a farm	Burning waste in the open
C	162m SE	-	WEX170003	Using waste exemption	On a farm	Use of waste in construction
C	162m SE	-	WEX170003	Using waste exemption	On a farm	Spreading waste on agricultural land to confer benefit
C	162m SE	-	WEX170003	Storing waste exemption	On a farm	Storage of waste in a secure place
C	162m SE	-	WEX170003	Treating waste exemption	On a farm	Recovery of scrap metal
D	164m W	HUNTINGDON ROAD, THRAPSTON, KETTERING, NN14 4QT	WEX151006	Treating waste exemption	Not on a farm	Preparatory treatments (baling, sorting, shredding etc)
D	164m W	HUNTINGDON ROAD, THRAPSTON, KETTERING, NN14 4QT	WEX159801	Storing waste exemption	Not on a Farm	Storage of waste in a secure place
D	164m W	-	WEX258157	Treating waste exemption	Not on a farm	Sorting mixed waste
4	167m SE	Land at TL02307779	EPR/LE5642ED /A001	Storing waste exemption	Non-Agricultural Waste Only	Storage of sludge
D	167m W	Primark Distribution Centre Huntingdon Road Kettering Northamptonshire NN14 4QT	EPR/KE5944EU /A001	Treating waste exemption	Non-Agricultural Waste Only	Preparatory treatments (baling, sorting, shredding etc)
5	176m SE	Land at TL0245078090	EPR/DE5848EM/A001	Storing waste exemption	Non-Agricultural Waste Only	Storage of sludge
E	179m S	Bottom Lodge Huntingdon Road T Northants NN14 4NJ	EPR/AH0376LJ /A001	Disposing of waste exemption	Both agricultural and non-agricultural waste	Burning waste in the open

ID	Location	Site	Reference	Category	Sub-Category	Description
E	179m S	Bottom Lodge Huntingdon Road T Northants NN14 4NJ	EPR/AH0376LJ /A001	Treating waste exemption	Both agricultural and non-agricultural waste	Treatment of waste wood and waste plant matter by chipping, shredding, cutting or pulverising
E	179m S	Bottom Lodge Huntingdon Road T Northants NN14 4NJ	EPR/AH0376LJ /A001	Using waste exemption	Both agricultural and non-agricultural waste	Use of waste in construction
E	179m S	Bottom Lodge Huntingdon Road T Northants NN14 4NJ	EPR/AH0376LJ /A001	Using waste exemption	Both agricultural and non-agricultural waste	Spreading waste on agricultural land to confer benefit
E	179m S	Bottom Lodge Huntingdon Road T Northants NN14 4NJ	EPR/AH0376LJ /A001	Using waste exemption	Both agricultural and non-agricultural waste	Spreading waste on non-agricultural land to confer benefit
E	179m S	Bottom Lodge Huntingdon Road T Northants NN14 4NJ	EPR/AH0376LJ /A001	Using waste exemption	Both agricultural and non-agricultural waste	Use of mulch
E	179m S	Bottom Lodge Huntingdon Road T Northants NN14 4NJ	EPR/AH0376LJ /A001	Using waste exemption	Both agricultural and non-agricultural waste	Spreading of plant matter to confer benefit
E	179m S	Bottom Lodge Huntingdon Road T Northants NN14 4NJ	EPR/AH0376LJ /A001	Using waste exemption	Both agricultural and non-agricultural waste	Use of waste for a specified purpose
6	237m SE	-	WEX163617	Storing waste exemption	On a Farm	Storage of sludge
7	240m S	-	WEX124708	Storing waste exemption	On a farm	Storage of sludge
8	280m SE	-	WEX161609	Storing waste exemption	On a Farm	Storage of sludge
9	321m S	-	WEX161603	Storing waste exemption	On a Farm	Storage of sludge

ID	Location	Site	Reference	Category	Sub-Category	Description
10	439m W	A14 From M1 J19 to Thrapston SP 56118 78966 to	EPR/BE5483EC/A001	Using waste exemption	Non-Agricultural Waste Only	Use of waste in construction
11	490m SW	-	WEX164155	Storing waste exemption	On a Farm	Storage of sludge

This data is sourced from the Environment Agency and Natural Resources Wales.

4 Current industrial land use

Site Outline

Search buffers in metres (m)

Recent industrial land uses

Hazardous substance storage/usage

Part A(1) industrial activities

Licensed Discharges to controlled waters

List 2 Dangerous Substances

Pollution Incidents (EA/NRW)

4.1 Recent industrial land uses

Records within 250m	3

Current potentially contaminative industrial sites.

Features are displayed on the Current industrial land use map on **page 26**

ID	Location	Company	Address	Activity	Category
B	86m S	Astwell Augers Ltd	Huntingdon Road, Thrapston, Kettering, Northamptonshire, NN14 4PT	General Purpose Machinery	Industrial Products
B	89m S	Depot	Northamptonshire, NN14	Container and Storage	Transport, Storage and Delivery
5	237m NE	Pylon	Northamptonshire, NN14	Electrical Features	Infrastructure and Facilities

This data is sourced from Ordnance Survey.

4.2 Current or recent petrol stations

Records within 500m	0

Open, closed, under development and obsolete petrol stations.

This data is sourced from Experian.

4.3 Electricity cables

Records within 500m	0

High voltage underground electricity transmission cables.

This data is sourced from National Grid.

4.4 Gas pipelines

Records within 500m	0

High pressure underground gas transmission pipelines.

This data is sourced from National Grid.

4.5 Sites determined as Contaminated Land

Records within 500m	0

Contaminated Land Register of sites designated under Part 2a of the Environmental Protection Act 1990.

This data is sourced from Local Authority records.

4.6 Control of Major Accident Hazards (COMAH)

Records within 500m	0

Control of Major Accident Hazards (COMAH) sites. This data includes upper and lower tier sites, and includes a historical archive of COMAH sites and Notification of Installations Handling Hazardous Substances (NIHHS) records.

This data is sourced from the Health and Safety Executive.

4.7 Regulated explosive sites

Records within 500m	0

Sites registered and licensed by the Health and Safety Executive under the Manufacture and Storage of Explosives Regulations 2005 (MSER). The last update to this data was in April 2011.

This data is sourced from the Health and Safety Executive.

4.8 Hazardous substance storage/usage

Records within 500m	1

Consents granted for a site to hold certain quantities of hazardous substances at or above defined limits in accordance with the Planning (Hazardous Substances) Regulations 2015.

Features are displayed on the Current industrial land use map on **page 26**

ID	Location	Details	
4	173m W	Application reference number: 12/01559/HAZ Application status: Approved Application date: 13/09/2012 Address: DHL Excel Supply Chain, Thrapston Site, Huntingdon Road, Thrapston, East Northanptonshire District Council, England, NN14 4QT	Details: Application for hazardous substances consent: Liquefied petroleum gas storage Enforcement: No Enforcement Notified Date of enforcement: No Enforcement Notified Comment: No Enforcement Notified

This data is sourced from Local Authority records.

4.9 Historical licensed industrial activities (IPC)

Records within 500m	0

Integrated Pollution Control (IPC) records of substance releases to air, land and water. This data represents a historical archive as the IPC regime has been superseded.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.10 Licensed industrial activities (Part A(1))

Records within 500m	5

Records of Part A(1) installations regulated under the Environmental Permitting (England and Wales) Regulations 2016 for the release of substances to the environment.

Features are displayed on the Current industrial land use map on **page 26**

ID	Location	Details	
A	17m W	Operator: MICK GEORGE HAULAGE LTD Installation Name: RECTORY FARM QUARRY Process: WASTE LANDFILLING; ANY OTHER LANDFILL TO WHICH THE 2002 LANDFILL REGULATIONS APPLY Permit Number: PP3233XK Original Permit Number: BT9879IY	EPR Reference: - Issue Date: 11/01/2008 Effective Date: 31/03/2008 Last date noted as effective: 01/04/2009 Status: REVOKED
A	17m W	Operator: MICK GEORGE (HAULAGE) LTD Installation Name: - Process: WASTE LANDFILLING; >10 T/D WITH CAPACITY >25,000T EXCLUDING INERT WASTE Permit Number: BT9879 Original Permit Number: BT9879	EPR Reference: - Issue Date: - Effective Date: - Last date noted as effective: 01/10/2004 Status: SUPERSEDED BY PAS
A	17m W	Operator: MICK GEORGE HAULAGE LTD Installation Name: RECTORY FARM QUARRY Process: WASTE LANDFILLING; >10 T/D WITH CAPACITY >25,000T EXCLUDING INERT WASTE Permit Number: BT9879IY Original Permit Number: BT9879IY	EPR Reference: - Issue Date: 05/07/2004 Effective Date: 05/07/2004 Last date noted as effective: 03/01/2008 Status: SUPERCEDED
A	17m W	Operator: MICK GEORGE HAULAGE LTD Installation Name: RECTORY FARM QUARRY Process: WASTE LANDFILLING; ANY OTHER LANDFILL TO WHICH THE 2002 LANDFILL REGULATIONS APPLY Permit Number: BT9879IY Original Permit Number: BT9879IY	EPR Reference: - Issue Date: 05/07/2004 Effective Date: 05/07/2004 Last date noted as effective: 25/01/2021 Status: SUPERCEDED
A	17m W	Operator: MICK GEORGE HAULAGE LTD Installation Name: RECTORY FARM QUARRY Process: WASTE LANDFILLING; >10 T/D WITH CAPACITY >25,000T EXCLUDING INERT WASTE Permit Number: EP3837LU Original Permit Number: BT9879IY	EPR Reference: - Issue Date: 17/10/2006 Effective Date: 18/10/2006 Last date noted as effective: 25/01/2021 Status: SUPERCEDED

This data is sourced from the Environment Agency and Natural Resources Wales.

4.11 Licensed pollutant release (Part A(2)/B)

Records within 500m	**0**

Records of Part A(2) and Part B installations regulated under the Environmental Permitting (England and Wales) Regulations 2016 for the release of substances to the environment.

This data is sourced from Local Authority records.

4.12 Radioactive Substance Authorisations

Records within 500m	0

Records of the storage, use, accumulation and disposal of radioactive substances regulated under the Radioactive Substances Act 1993.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.13 Licensed Discharges to controlled waters

Records within 500m	2

Discharges of treated or untreated effluent to controlled waters under the Water Resources Act 1991.

Features are displayed on the Current industrial land use map on **page 26**

ID	Location	Address	Details	
1	On site	CASTLE & MANOR FARM, THRAPSTON ROAD, NR TITCHMARSH, NORTHAMPTONSHIRE	Effluent Type: SEWAGE DISCHARGES - FINAL/TREATED EFFLUENT - NOT WATER COMPANY Permit Number: PRNNF01825 Permit Version: 1 Receiving Water: Trib River Nene	Status: POST NRA LEGISLATION WHERE ISSUE DATE > 31-AUG-89 (HISTORIC ONLY) Issue date: 20/10/1989 Effective Date: 20/10/1989 Revocation Date: 11/02/1992
2	On site	RECTORY FARM/CASTLE MANOR FARM, TITCHMARSH, THRAPSTON, NORTHAMPTONSHIRE	Effluent Type: TRADE DISCHARGES - MINERAL WORKINGS Permit Number: PRNNF12740 Permit Version: 1 Receiving Water: TRIBUTARY OF POLOPIT BROOK	Status: CONSENT REVOKED - DISCHARGE CEASED (WRA 91, SCHED 10 & 6) Issue date: 09/08/2002 Effective Date: 08/07/2002 Revocation Date: 11/12/2006

This data is sourced from the Environment Agency and Natural Resources Wales.

4.14 Pollutant release to surface waters (Red List)

Records within 500m	0

Discharges of specified substances under the Environmental Protection (Prescribed Processes and Substances) Regulations 1991.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.15 Pollutant release to public sewer

Records within 500m	0

Discharges of Special Category Effluents to the public sewer.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.16 List 1 Dangerous Substances

Records within 500m	0

Discharges of substances identified on List I of European Directive E 2006/11/EC, and regulated under the Environmental Damage (Prevention and Remediation) Regulations 2015.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.17 List 2 Dangerous Substances

Records within 500m	1

Discharges of substances identified on List II of European Directive E 2006/11/EC, and regulated under the Environmental Damage (Prevention and Remediation) Regulations 2015.

Features are displayed on the Current industrial land use map on **page 26**

ID	Location	Name	Status	Receiving Water	Authorised Substances
7	448m W	Wm Morrison Produce Ltd	Not Active	Na	pH

This data is sourced from the Environment Agency and Natural Resources Wales.

4.18 Pollution Incidents (EA/NRW)

Records within 500m	3

Records of substantiated pollution incidents. Since 2006 this data has only included category 1 (major) and 2 (significant) pollution incidents.

Features are displayed on the Current industrial land use map on **page 26**

ID	Location	Details	
B	79m S	Incident Date: 12/07/2003 Incident Identification: 173079 Pollutant: Oils and Fuel Pollutant Description: Diesel	Water Impact: Category 4 (No Impact) Land Impact: Category 3 (Minor) Air Impact: Category 4 (No Impact)

ID	Location	Details	
3	81m SW	Incident Date: 30/10/2002 Incident Identification: 117789 Pollutant: General Biodegradable Materials and Wastes Pollutant Description: Other General Biodegradable Material or Waste	Water Impact: Category 4 (No Impact) Land Impact: Category 3 (Minor) Air Impact: Category 4 (No Impact)
6	351m NW	Incident Date: 11/10/2001 Incident Identification: 35800 Pollutant: Oils and Fuel Pollutant Description: Diesel	Water Impact: Category 4 (No Impact) Land Impact: Category 4 (No Impact) Air Impact: Category 4 (No Impact)

This data is sourced from the Environment Agency and Natural Resources Wales.

4.19 Pollution inventory substances

Records within 500m	0

The pollution inventory (substances) includes reporting on annual emissions of certain regulated substances to air, controlled waters and land. A reporting threshold for each substance is also included. Where emissions fall below the reporting threshold, no value will be given. The data is given for the most recent complete year available.

This data is sourced from the Environment Agency and the Scottish Environment Protection Agency.

4.20 Pollution inventory waste transfers

Records within 500m	0

The pollution inventory (waste transfers) includes reporting on annual transfers and recovery/disposal of controlled wastes from a site. A reporting threshold for each waste type is also included. Where releases fall below the reporting threshold, no value will be given. The data is given for the most recent complete year available.

This data is sourced from the Environment Agency and the Scottish Environment Protection Agency.

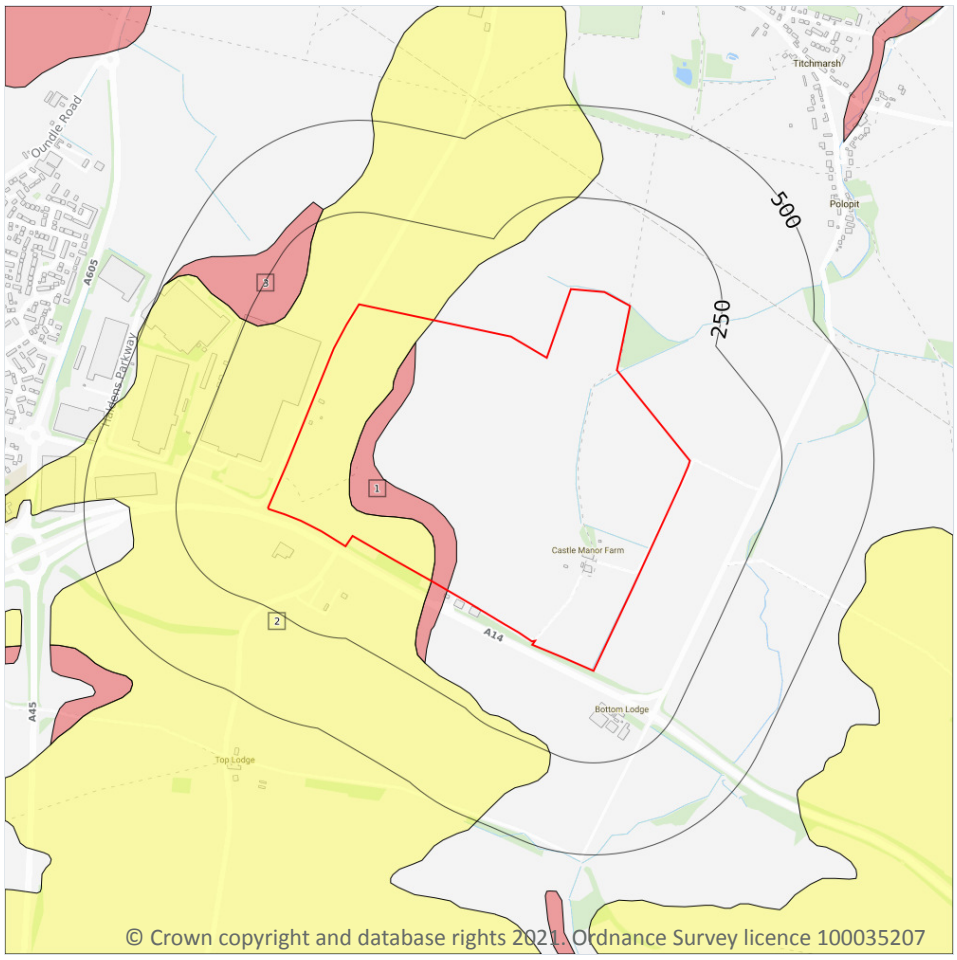
4.21 Pollution inventory radioactive waste

Records within 500m	0

The pollution inventory (radioactive wastes) includes reporting on annual releases of radioactive substances from a site, including the means of release. Where releases fall below the reporting threshold, no value will be given. The data is given for the most recent complete year available.

This data is sourced from the Environment Agency and the Scottish Environment Protection Agency.

5 Hydrogeology - Superficial aquifer



Site Outline

Search buffers in metres (m)

- Principal
- Secondary A
- Secondary B
- Secondary Undifferentiated
- Unproductive
- Unknown

5.1 Superficial aquifer

Records within 500m	3

Aquifer status of groundwater held within superficial geology.

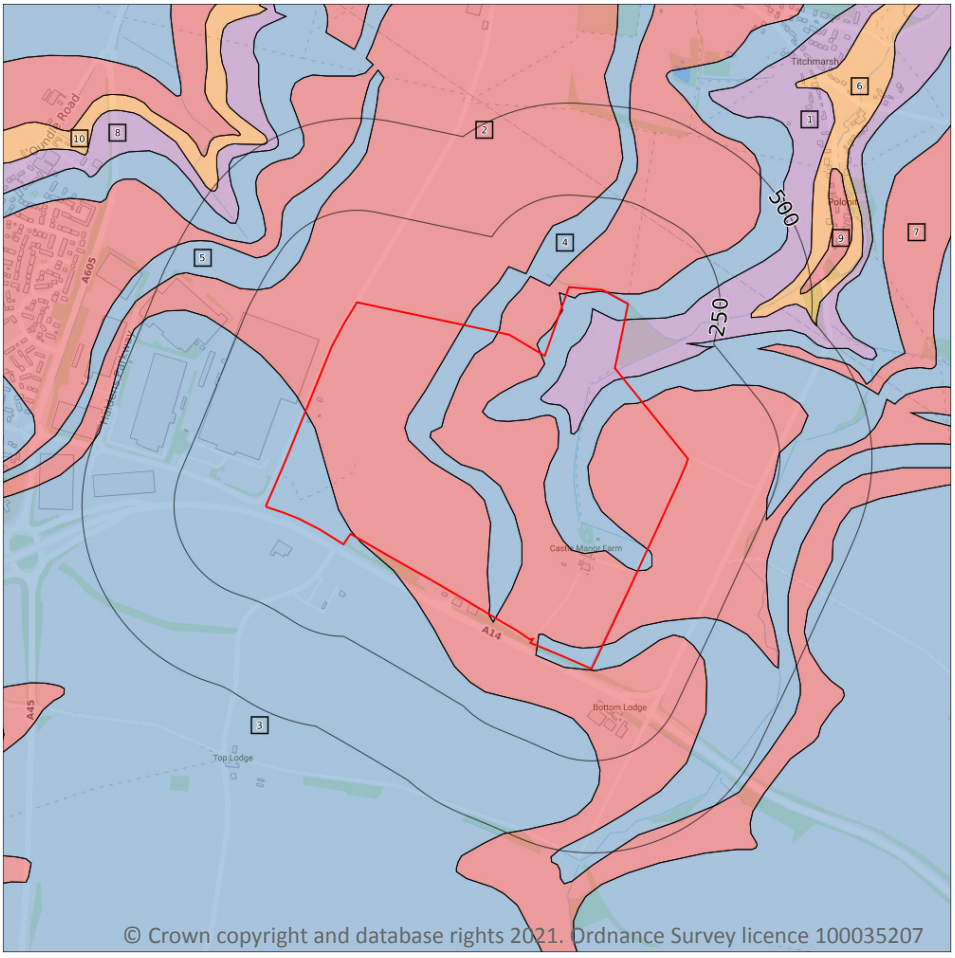
Features are displayed on the Hydrogeology map on **page 33**

ID	Location	Designation	Description
1	On site	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers
2	On site	Secondary Undifferentiated	Assigned where it is not possible to attribute either category A or B to a rock type. In general these layers have previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type

ID	Location	Designation	Description
3	152m NW	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers

This data is sourced from the British Geological Survey, the Environment Agency and Natural Resources Wales.

Bedrock aquifer



Site Outline

Search buffers in metres (m)

- Principal
- Secondary A
- Secondary B
- Secondary Undifferentiated
- Unproductive

5.2 Bedrock aquifer

Records within 500m	10

Aquifer status of groundwater held within bedrock geology.

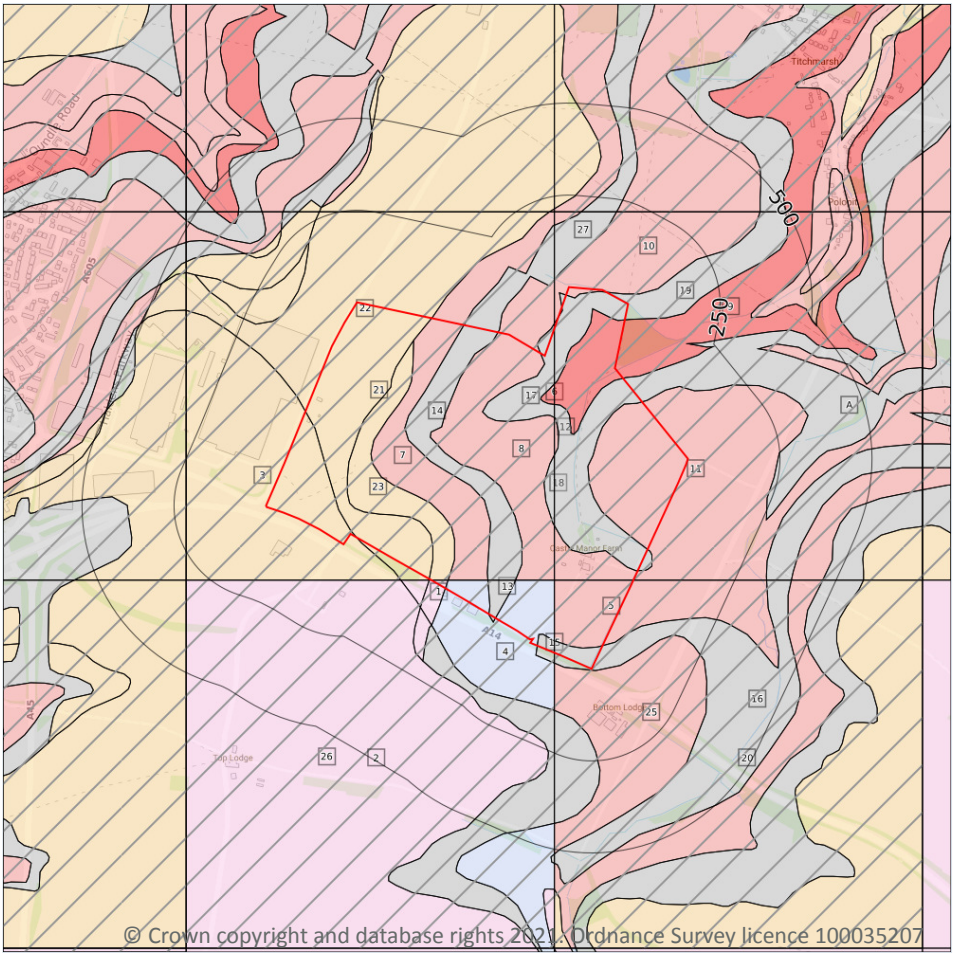
Features are displayed on the Bedrock aquifer map on **page 35**

ID	Location	Designation	Description
1	On site	Principal	Geology of high intergranular and/or fracture permeability, usually providing a high level of water storage and may support water supply/river base flow on a strategic scale. Generally principal aquifers were previously major aquifers
2	On site	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers

ID	Location	Designation	Description
3	**On site**	**Unproductive**	**These are rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow**
4	**On site**	**Unproductive**	**These are rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow**
5	192m NW	Unproductive	These are rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow
6	336m E	Secondary B	Predominantly lower permeability layers which may store/yield limited amounts of groundwater due to localised features such as fissures, thin permeablehorizons and weathering. These are generally the water-bearing parts of the former non-aquifers
7	337m NE	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers
8	394m NW	Principal	Geology of high intergranular and/or fracture permeability, usually providing a high level of water storage and may support water supply/river base flow on a strategic scale. Generally principal aquifers were previously major aquifers
9	470m E	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers
10	491m NW	Secondary B	Predominantly lower permeability layers which may store/yield limited amounts of groundwater due to localised features such as fissures, thin permeablehorizons and weathering. These are generally the water-bearing parts of the former non-aquifers

This data is sourced from the British Geological Survey, the Environment Agency and Natural Resources Wales.

Groundwater vulnerability



Site Outline

Search buffers in metres (m)

Superficial vulnerability

- Principal superficial aquifer, high vulnerability
- Secondary superficial aquifer, high vulnerability
- Principal superficial aquifer, medium vulnerability
- Secondary superficial aquifer, medium vulnerability
- Principal superficial aquifer, low vulnerability
- Secondary superficial aquifer, low vulnerability

Bedrock vulnerability

- Principal bedrock aquifer, high vulnerability
- Secondary bedrock aquifer, high vulnerability
- Principal bedrock aquifer, medium vulnerability
- Secondary bedrock aquifer, medium vulnerability
- Principal bedrock aquifer, low vulnerability
- Secondary bedrock aquifer, low vulnerability

Other information

- Unproductive aquifer
- Soluble rock risk
- Local information

5.3 Groundwater vulnerability

Records within 50m	25

An assessment of the vulnerability of groundwater to a pollutant discharged at ground level based on the hydrological, geological, hydrogeological and soil properties within a one kilometre square grid. Groundwater vulnerability is described as High, Medium or Low as follows:

- High - Areas able to easily transmit pollution to groundwater. They are likely to be characterised by high leaching soils and the absence of low permeability superficial deposits.
- Medium - Intermediate between high and low vulnerability.
- Low - Areas that provide the greatest protection from pollution. They are likely to be characterised by low leaching soils and/or the presence of superficial deposits characterised by a low permeability.

Features are displayed on the Groundwater vulnerability map on **page 37**

ID	Location	Summary	Soil / surface	Superficial geology	Bedrock geology
1	On site	Summary Classification: Secondary superficial aquifer - Medium Vulnerability Combined classification: Productive Bedrock Aquifer, Productive Superficial Aquifer	Leaching class: Intermediate Infiltration value: 40-70% Dilution value: <300mm/year	Vulnerability: Medium Aquifer type: Secondary Thickness: 3-10m Patchiness value: >90% Recharge potential: Low	Vulnerability: Low Aquifer type: Secondary Flow mechanism: Well connected fractures
3	On site	Summary Classification: Secondary superficial aquifer - High Vulnerability Combined classification: Unproductive Bedrock Aquifer, Productive Superficial Aquifer	Leaching class: High Infiltration value: 40-70% Dilution value: <300mm/year	Vulnerability: High Aquifer type: Secondary Thickness: 3-10m Patchiness value: <90% Recharge potential: Low	Vulnerability: Unproductive Aquifer type: Unproductive Flow mechanism: Well connected fractures
4	On site	Summary Classification: Secondary bedrock aquifer - Low Vulnerability Combined classification: Productive Bedrock Aquifer, No Superficial Aquifer	Leaching class: Intermediate Infiltration value: 40-70% Dilution value: <300mm/year	Vulnerability: - Aquifer type: - Thickness: 3-10m Patchiness value: >90% Recharge potential: Low	Vulnerability: Low Aquifer type: Secondary Flow mechanism: Well connected fractures
5	On site	Summary Classification: Secondary bedrock aquifer - High Vulnerability Combined classification: Productive Bedrock Aquifer, No Superficial Aquifer	Leaching class: High Infiltration value: >70% Dilution value: <300mm/year	Vulnerability: - Aquifer type: - Thickness: <3m Patchiness value: <90% Recharge potential: No Data	Vulnerability: High Aquifer type: Secondary Flow mechanism: Well connected fractures
6	On site	Summary Classification: Principal bedrock aquifer - High Vulnerability Combined classification: Productive Bedrock Aquifer, No Superficial Aquifer	Leaching class: High Infiltration value: 40-70% Dilution value: <300mm/year	Vulnerability: - Aquifer type: - Thickness: 3-10m Patchiness value: <90% Recharge potential: Low	Vulnerability: High Aquifer type: Principal Flow mechanism: Well connected fractures
7	On site	Summary Classification: Secondary bedrock aquifer - High Vulnerability Combined classification: Productive Bedrock Aquifer, No Superficial Aquifer	Leaching class: High Infiltration value: 40-70% Dilution value: <300mm/year	Vulnerability: - Aquifer type: - Thickness: 3-10m Patchiness value: <90% Recharge potential: Low	Vulnerability: High Aquifer type: Secondary Flow mechanism: Well connected fractures

ID	Location	Summary	Soil / surface	Superficial geology	Bedrock geology
8	On site	Summary Classification: Secondary bedrock aquifer - High Vulnerability Combined classification: Productive Bedrock Aquifer, No Superficial Aquifer	Leaching class: High Infiltration value: 40-70% Dilution value: <300mm/year	Vulnerability: - Aquifer type: - Thickness: 3-10m Patchiness value: <90% Recharge potential: Low	Vulnerability: High Aquifer type: Secondary Flow mechanism: Well connected fractures
9	On site	Summary Classification: Principal bedrock aquifer - High Vulnerability Combined classification: Productive Bedrock Aquifer, No Superficial Aquifer	Leaching class: High Infiltration value: >70% Dilution value: <300mm/year	Vulnerability: - Aquifer type: - Thickness: 3-10m Patchiness value: <90% Recharge potential: No Data	Vulnerability: High Aquifer type: Principal Flow mechanism: Well connected fractures
10	On site	Summary Classification: Secondary bedrock aquifer - High Vulnerability Combined classification: Productive Bedrock Aquifer, No Superficial Aquifer	Leaching class: High Infiltration value: >70% Dilution value: <300mm/year	Vulnerability: - Aquifer type: - Thickness: 3-10m Patchiness value: <90% Recharge potential: No Data	Vulnerability: High Aquifer type: Secondary Flow mechanism: Well connected fractures
11	On site	Summary Classification: Secondary bedrock aquifer - High Vulnerability Combined classification: Productive Bedrock Aquifer, No Superficial Aquifer	Leaching class: High Infiltration value: >70% Dilution value: <300mm/year	Vulnerability: - Aquifer type: - Thickness: 3-10m Patchiness value: <90% Recharge potential: No Data	Vulnerability: High Aquifer type: Secondary Flow mechanism: Well connected fractures
12	On site	Summary Classification: Secondary bedrock aquifer - High Vulnerability Combined classification: Productive Bedrock Aquifer, No Superficial Aquifer	Leaching class: High Infiltration value: >70% Dilution value: <300mm/year	Vulnerability: - Aquifer type: - Thickness: 3-10m Patchiness value: <90% Recharge potential: No Data	Vulnerability: High Aquifer type: Secondary Flow mechanism: Well connected fractures
13	On site	Summary Classification: Unproductive aquifer (may have productive aquifer beneath) Combined classification: Unproductive Bedrock Aquifer, No Superficial Aquifer	Leaching class: Intermediate Infiltration value: 40-70% Dilution value: <300mm/year	Vulnerability: - Aquifer type: - Thickness: 3-10m Patchiness value: >90% Recharge potential: Low	Vulnerability: Unproductive Aquifer type: Unproductive Flow mechanism: Well connected fractures

ID	Location	Summary	Soil / surface	Superficial geology	Bedrock geology
14	On site	Summary Classification: Unproductive aquifer (may have productive aquifer beneath) Combined classification: Unproductive Bedrock Aquifer, No Superficial Aquifer	Leaching class: High Infiltration value: 40-70% Dilution value: <300mm/year	Vulnerability: - Aquifer type: - Thickness: 3-10m Patchiness value: <90% Recharge potential: Low	Vulnerability: Unproductive Aquifer type: Unproductive Flow mechanism: Well connected fractures
15	On site	Summary Classification: Unproductive aquifer (may have productive aquifer beneath) Combined classification: Unproductive Bedrock Aquifer, No Superficial Aquifer	Leaching class: Intermediate Infiltration value: 40-70% Dilution value: <300mm/year	Vulnerability: - Aquifer type: - Thickness: 3-10m Patchiness value: >90% Recharge potential: Low	Vulnerability: Unproductive Aquifer type: Unproductive Flow mechanism: Well connected fractures
16	On site	Summary Classification: Unproductive aquifer (may have productive aquifer beneath) Combined classification: Unproductive Bedrock Aquifer, No Superficial Aquifer	Leaching class: High Infiltration value: >70% Dilution value: <300mm/year	Vulnerability: - Aquifer type: - Thickness: <3m Patchiness value: <90% Recharge potential: No Data	Vulnerability: Unproductive Aquifer type: Unproductive Flow mechanism: Well connected fractures
17	On site	Summary Classification: Unproductive aquifer (may have productive aquifer beneath) Combined classification: Unproductive Bedrock Aquifer, No Superficial Aquifer	Leaching class: High Infiltration value: 40-70% Dilution value: <300mm/year	Vulnerability: - Aquifer type: - Thickness: 3-10m Patchiness value: <90% Recharge potential: Low	Vulnerability: Unproductive Aquifer type: Unproductive Flow mechanism: Well connected fractures
18	On site	Summary Classification: Unproductive aquifer (may have productive aquifer beneath) Combined classification: Unproductive Bedrock Aquifer, No Superficial Aquifer	Leaching class: High Infiltration value: 40-70% Dilution value: <300mm/year	Vulnerability: - Aquifer type: - Thickness: 3-10m Patchiness value: <90% Recharge potential: Low	Vulnerability: Unproductive Aquifer type: Unproductive Flow mechanism: Well connected fractures

ID	Location	Summary	Soil / surface	Superficial geology	Bedrock geology
19	**On site**	**Summary Classification: Unproductive aquifer (may have productive aquifer beneath) Combined classification: Unproductive Bedrock Aquifer, No Superficial Aquifer**	**Leaching class: High Infiltration value: >70% Dilution value: <300mm/year**	**Vulnerability: - Aquifer type: - Thickness: 3-10m Patchiness value: <90% Recharge potential: No Data**	**Vulnerability: Unproductive Aquifer type: Unproductive Flow mechanism: Well connected fractures**
22	**On site**	**Summary Classification: Secondary superficial aquifer - High Vulnerability Combined classification: Productive Bedrock Aquifer, Productive Superficial Aquifer**	**Leaching class: High Infiltration value: 40-70% Dilution value: <300mm/year**	**Vulnerability: High Aquifer type: Secondary Thickness: 3-10m Patchiness value: <90% Recharge potential: Low**	**Vulnerability: High Aquifer type: Secondary Flow mechanism: Well connected fractures**
23	**On site**	**Summary Classification: Secondary superficial aquifer - High Vulnerability Combined classification: Productive Bedrock Aquifer, Productive Superficial Aquifer**	**Leaching class: High Infiltration value: 40-70% Dilution value: <300mm/year**	**Vulnerability: High Aquifer type: Secondary Thickness: 3-10m Patchiness value: <90% Recharge potential: Low**	**Vulnerability: High Aquifer type: Secondary Flow mechanism: Well connected fractures**
A	**On site**	**Summary Classification: Unproductive aquifer (may have productive aquifer beneath) Combined classification: Unproductive Bedrock Aquifer, No Superficial Aquifer**	**Leaching class: High Infiltration value: >70% Dilution value: <300mm/year**	**Vulnerability: - Aquifer type: - Thickness: 3-10m Patchiness value: <90% Recharge potential: No Data**	**Vulnerability: Unproductive Aquifer type: Unproductive Flow mechanism: Well connected fractures**
24	3m SW	Summary Classification: Secondary superficial aquifer - Medium Vulnerability Combined classification: Productive Bedrock Aquifer, Productive Superficial Aquifer	Leaching class: Intermediate Infiltration value: 40-70% Dilution value: <300mm/year	Vulnerability: Medium Aquifer type: Secondary Thickness: 3-10m Patchiness value: >90% Recharge potential: Low	Vulnerability: Low Aquifer type: Secondary Flow mechanism: Well connected fractures
25	3m S	Summary Classification: Secondary bedrock aquifer - High Vulnerability Combined classification: Productive Bedrock Aquifer, No Superficial Aquifer	Leaching class: High Infiltration value: >70% Dilution value: <300mm/year	Vulnerability: - Aquifer type: - Thickness: <3m Patchiness value: <90% Recharge potential: No Data	Vulnerability: High Aquifer type: Secondary Flow mechanism: Well connected fractures

ID	Location	Summary	Soil / surface	Superficial geology	Bedrock geology
26	40m SW	Summary Classification: Secondary superficial aquifer - Medium Vulnerability Combined classification: Unproductive Bedrock Aquifer, Productive Superficial Aquifer	Leaching class: Intermediate Infiltration value: 40-70% Dilution value: <300mm/year	Vulnerability: Medium Aquifer type: Secondary Thickness: 3-10m Patchiness value: >90% Recharge potential: Low	Vulnerability: Unproductive Aquifer type: Unproductive Flow mechanism: Well connected fractures
27	42m NW	Summary Classification: Unproductive aquifer (may have productive aquifer beneath) Combined classification: Unproductive Bedrock Aquifer, No Superficial Aquifer	Leaching class: High Infiltration value: >70% Dilution value: <300mm/year	Vulnerability: - Aquifer type: - Thickness: 3-10m Patchiness value: <90% Recharge potential: No Data	Vulnerability: Unproductive Aquifer type: Unproductive Flow mechanism: Well connected fractures

This data is sourced from the British Geological Survey, the Environment Agency and Natural Resources Wales.

5.4 Groundwater vulnerability- soluble rock risk

Records on site	**4**

This dataset identifies areas where solution features that enable rapid movement of a pollutant may be present within a 1km grid square.

ID	Maximum soluble risk category	Percentage of grid square covered by maximum risk
2	**Significant soluble rocks are likely to be present. Problems unlikely except with considerable surface or subsurface water flow.**	**2.0%**
20	**Significant soluble rocks are likely to be present. Problems unlikely except with considerable surface or subsurface water flow.**	**9.0%**
21	**Significant soluble rocks are likely to be present. Low possibility of localised subsidence or dissolution-related degradation of bedrock occurring naturally, but may be possible in adverse conditions such as high surface or subsurface water flow.**	**0.0%**
A	**Significant soluble rocks are likely to be present. Problems unlikely except with considerable surface or subsurface water flow.**	**54.0%**

This data is sourced from the British Geological Survey and the Environment Agency.

5.5 Groundwater vulnerability- local information

Records on site	0

This dataset identifies areas where additional local information affecting vulnerability is held by the Environment Agency. Further information can be obtained by contacting the Environment Agency local Area groundwater team through the Environment Agency National Customer Call Centre on 03798 506 506 or by email on enquiries@environment-agency.gov.uk.

This data is sourced from the British Geological Survey and the Environment Agency.

Abstractions and Source Protection Zones

Site Outline

Search buffers in metres (m)

- Source Protection Zone 1 — Inner catchment
- Source Protection Zone 2 — Outer catchment
- Source Protection Zone 3 — Total catchment
- Source Protection Zone 4 — Zone of Special Interest
- Source Protection Zone 1c — Inner catchment - confined aquifer
- Source Protection Zone 2c — Outer catchment - confined aquifer
- Source Protection Zone 3c — Total catchment - confined aquifer
- Drinking water abstraction licences
- Drinking water abstraction licences — Polygon features
- Drinking water abstraction licences — Linear features
- Groundwater abstraction licence (point)
- Groundwater abstraction licence (area)
- Groundwater abstraction licence (linear)
- Surface Water Abstractions (point)
- Surface Water Abstractions (area)
- Surface Water Abstractions (linear)

5.6 Groundwater abstractions

Records within 2000m	1

Licensed groundwater abstractions for sites extracting more than 20 cubic metres of water a day and includes active and historical records. The data may be for a single abstraction point, between two points (line data) or a larger area.

Features are displayed on the Abstractions and Source Protection Zones map on **page 44**

ID	Location	Details	
-	1261m NE	Status: Historical Licence No: 5/32/09/*G/0166 Details: General Farming & Domestic Direct Source: GROUND WATER SOURCE OF SUPPLY Point: WELL "B"AT TITCHMARSH Data Type: Point Name: R WOOD & CO Easting: 502900 Northing: 279800	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: - Original Start Date: 01/01/1966 Expiry Date: - Issue No: 100 Version Start Date: 01/01/1972 Version End Date: -

This data is sourced from the Environment Agency and Natural Resources Wales.

5.7 Surface water abstractions

Records within 2000m	**0**

Licensed surface water abstractions for sites extracting more than 20 cubic metres of water a day and includes active and historical records. The data may be for a single abstraction point, a stretch of watercourse or a larger area.

This data is sourced from the Environment Agency and Natural Resources Wales.

5.8 Potable abstractions

Records within 2000m	**0**

Licensed potable water abstractions for sites extracting more than 20 cubic metres of water a day and includes active and historical records. The data may be for a single abstraction point, a stretch of watercourse or a larger area.

This data is sourced from the Environment Agency and Natural Resources Wales.

5.9 Source Protection Zones

Records within 500m	**0**

Source Protection Zones define the sensitivity of an area around a potable abstraction site to contamination.

This data is sourced from the Environment Agency and Natural Resources Wales.

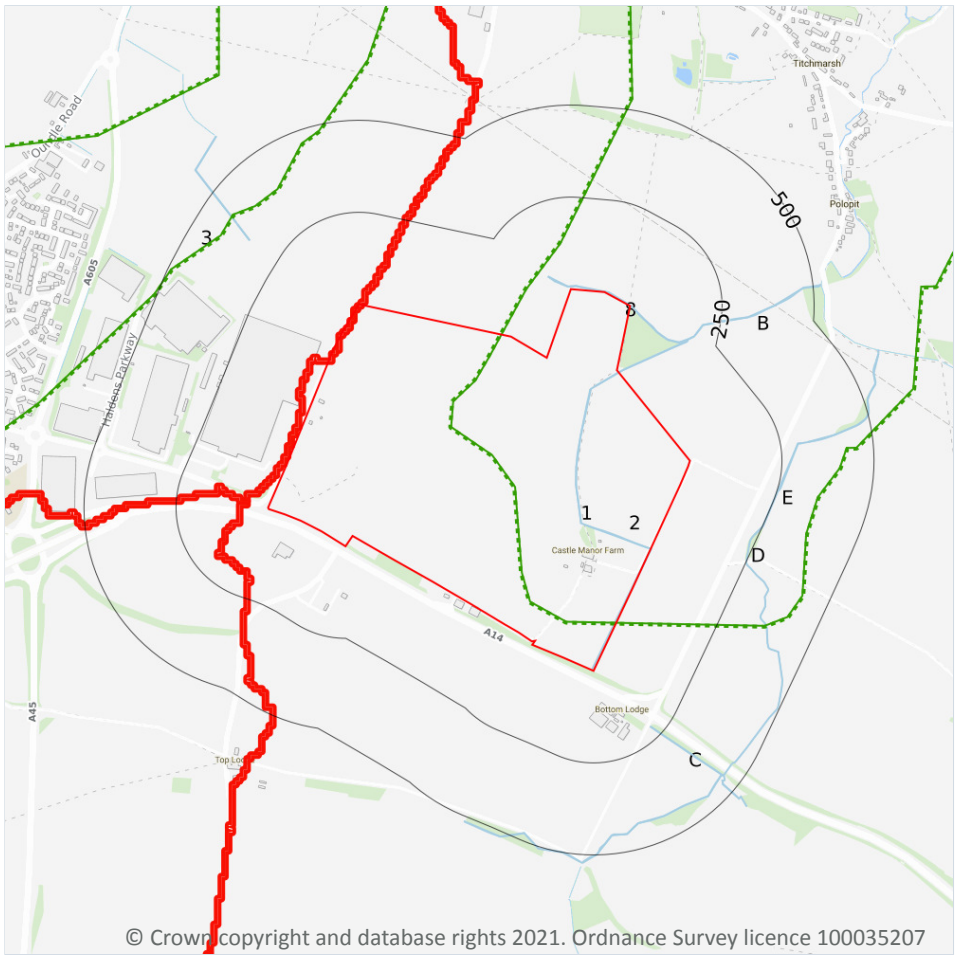
5.10 Source Protection Zones (confined aquifer)

Records within 500m	0

Source Protection Zones in the confined aquifer define the sensitivity around a deep groundwater abstraction to contamination. A confined aquifer would normally be protected from contamination by overlying geology and is only considered a sensitive resource if deep excavation/drilling is taking place.

This data is sourced from the Environment Agency and Natural Resources Wales.

6 Hydrology



Site Outline

Search buffers in metres (m)

Water Network (OS MasterMap)

Surface water features (wider than 5m)

Surface water features (narrower than 5m)

WFD River, canal and surface water transfer water bodies

WFD Lake water bodies

WFD Transitional and coastal water bodies

WFD Surface water body catchments boundaries

WFD Groundwater body boundaries

6.1 Water Network (OS MasterMap)

Records within 250m	**7**

Detailed water network of Great Britain showing the flow and precise central course of every river, stream, lake and canal.

Features are displayed on the Hydrology map on **page 47**

ID	Location	Type of water feature	Ground level	Permanence	Name
1	**On site**	**Inland river not influenced by normal tidal action.**	**On ground surface**	**Watercourse contains water year round (in normal circumstances)**	**-**

ID	Location	Type of water feature	Ground level	Permanence	Name
8	**On site**	**Inland river not influenced by normal tidal action.**	**On ground surface**	**Watercourse contains water year round (in normal circumstances)**	**-**
B	171m E	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
C	215m SE	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
D	236m SE	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
E	239m SE	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
D	250m SE	Inland river not influenced by normal tidal action.	Underground	Watercourse contains water year round (in normal circumstances)	-

This data is sourced from the Ordnance Survey.

6.2 Surface water features

Records within 250m	**8**

Covering rivers, streams and lakes (some overlap with OS MasterMap Water Network data in previous section) but additionally covers smaller features such as ponds. Rivers and streams narrower than 5m are represented as a single line. Lakes, ponds and rivers or streams wider than 5m are represented as polygons.

Features are displayed on the Hydrology map on **page 47**

This data is sourced from the Ordnance Survey.

6.3 WFD Surface water body catchments

Records on site	**2**

The Water Framework Directive is an EU-led framework for the protection of inland surface waters, estuaries, coastal waters and groundwater through river basin-level management planning. In terms of surface water, these basins are broken down into smaller units known as management, operational and water body catchments.

Features are displayed on the Hydrology map on **page 47**

ID	Location	Type	Water body catchment	Water body ID	Operational catchment	Management catchment
2	**On site**	**River WB catchment**	**Thorpe Waterville Brook**	**GB105032045190**	**Middle Nene**	**Nene**
3	**On site**	**River WB catchment**	**Nene - Islip to tidal**	**GB105032050381**	**Middle Nene**	**Nene**

This data is sourced from the Environment Agency and Natural Resources Wales.

6.4 WFD Surface water bodies

Records identified	**2**

Surface water bodies under the Directive may be rivers, lakes, estuary or coastal. To achieve the purpose of the Directive, environmental objectives have been set and are reported on for each water body. The progress towards delivery of the objectives is then reported on by the relevant competent authorities at the end of each six-year cycle. The river water body directly associated with the catchment listed in the previous section is detailed below, along with any lake, canal, coastal or artificial water body within 250m of the site. Click on the water body ID in the table to visit the EA Catchment Explorer to find out more about each water body listed.

Features are displayed on the Hydrology map on **page 47**

ID	Location	Type	Name	Water body ID	Overall rating	Chemical rating	Ecological rating	Year
-	1462m NW	River	Nene - Islip to tidal	GB105032050381	Moderate	Good	Moderate	2016
-	2061m N	River	Thorpe Waterville Brook	GB105032045190	Poor	Good	Poor	2016

This data is sourced from the Environment Agency and Natural Resources Wales.

6.5 WFD Groundwater bodies

Records on site	**1**

Groundwater bodies are also covered by the Directive and the same regime of objectives and reporting detailed in the previous section is in place. Click on the water body ID in the table to visit the EA Catchment Explorer to find out more about each groundwater body listed.

Features are displayed on the Hydrology map on **page 47**

ID	Location	Name	Water body ID	Overall rating	Chemical rating	Quantitative	Year
A	**On site**	**Northampton Sands**	**GB40501G445500**	**Good**	**Good**	**Good**	**2015**

This data is sourced from the Environment Agency and Natural Resources Wales.

7 River and coastal flooding

7.1 Risk of Flooding from Rivers and Sea (RoFRaS)

Records within 50m	0

The chance of flooding from rivers and/or the sea in any given year, based on cells of 50m. Each cell is allocated one of four flood risk categories, taking into account flood defences and their condition; Very low (less than 1 in 1000 chance in any given year), Low (less than 1 in 100 but greater than or equal to 1 in 1000 chance), Medium (less than 1 in 30 but greater than or equal to 1 in 100 chance) or High (greater than or equal to 1 in 30 chance).

This data is sourced from the Environment Agency and Natural Resources Wales.

7.2 Historical Flood Events

Records within 250m	0

Records of historic flooding from rivers, the sea, groundwater and surface water. Records began in 1946 when predecessor bodies started collecting detailed information about flooding incidents, although limited details may be included on flooding incidents prior to this date. Takes into account the presence of defences, structures, and other infrastructure where they existed at the time of flooding, and includes flood extents that may have been affected by overtopping, breaches or blockages.

This data is sourced from the Environment Agency and Natural Resources Wales.

7.3 Flood Defences

Records within 250m	0

Records of flood defences owned, managed or inspected by the Environment Agency and Natural Resources Wales. Flood defences can be structures, buildings or parts of buildings. Typically these are earth banks, stone and concrete walls, or sheet-piling that is used to prevent or control the extent of flooding.

This data is sourced from the Environment Agency and Natural Resources Wales.

7.4 Areas Benefiting from Flood Defences

Records within 250m	0

Areas that would benefit from the presence of flood defences in a 1 in 100 (1%) chance of flooding each year from rivers or 1 in 200 (0.5%) chance of flooding each year from the sea.

This data is sourced from the Environment Agency and Natural Resources Wales.

7.5 Flood Storage Areas

Records within 250m	0

Areas that act as a balancing reservoir, storage basin or balancing pond to attenuate an incoming flood peak to a flow level that can be accepted by the downstream channel or to delay the timing of a flood peak so that its volume is discharged over a longer period.

This data is sourced from the Environment Agency and Natural Resources Wales.

River and coastal flooding - Flood Zones

7.6 Flood Zone 2

Records within 50m	0

Areas of land at risk of flooding, when the presence of flood defences are ignored. Covering land between Flood Zone 3 (see next section) and the extent of the flooding from rivers or the sea with a 1 in 1000 (0.1%) chance of flooding each year.

This data is sourced from the Environment Agency and Natural Resources Wales.

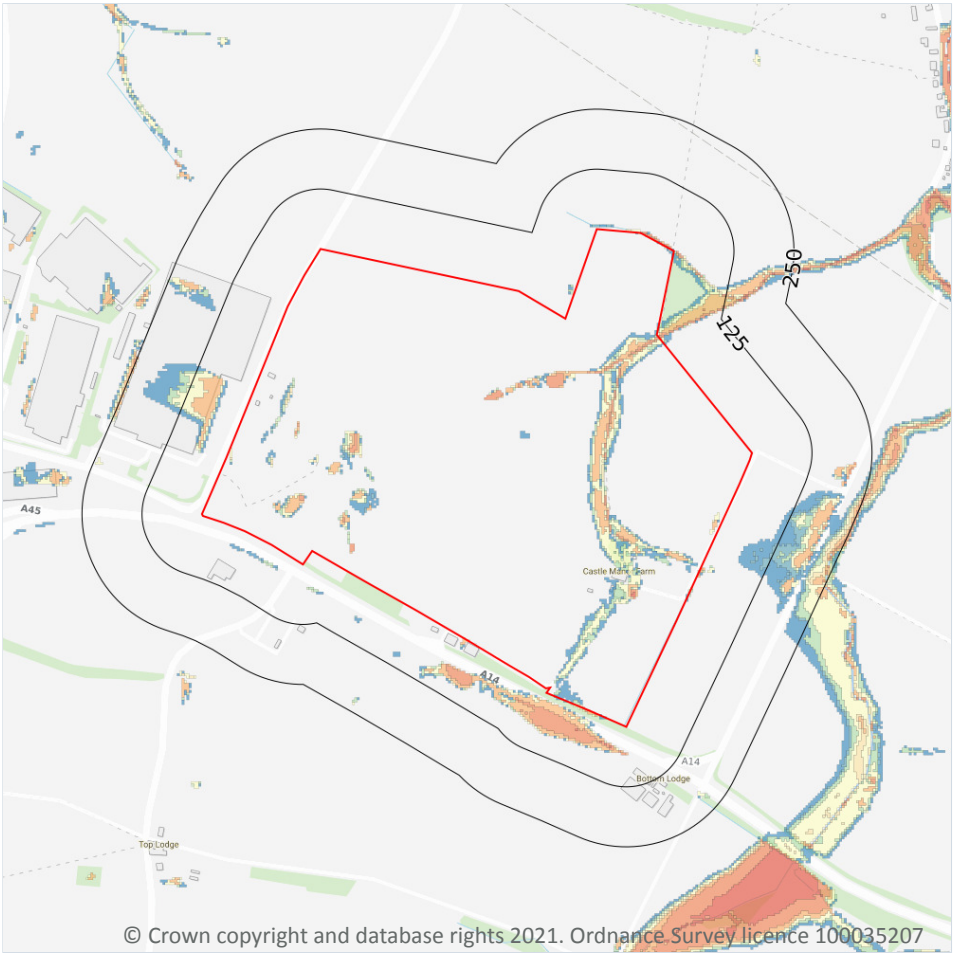
7.7 Flood Zone 3

Records within 50m	0

Areas of land at risk of flooding, when the presence of flood defences are ignored. Covering land with a 1 in 100 (1%) or greater chance of flooding each year from rivers or a 1 in 200 (0.5%) or greater chance of flooding each year from the sea.

This data is sourced from the Environment Agency and Natural Resources Wales.

8 Surface water flooding



Site Outline

Search buffers in metres (m)

1 in 1000 return period
- Depth between 0.1m - 0.3m
- Depth between 0.3m - 1.0m
- Depth greater than 1.0m

1 in 250 return period
- Depth between 0.1m - 0.3m
- Depth between 0.3m - 1.0m
- Depth greater than 1.0m

1 in 100 return period
- Depth between 0.1m - 0.3m
- Depth between 0.3m - 1.0m
- Depth greater than 1.0m

1 in 30 return period
- Depth between 0.1m - 0.3m
- Depth between 0.3m - 1.0m
- Depth greater than 1.0m

8.1 Surface water flooding

Highest risk on site	**1 in 30 year, Greater than 1.0m**
Highest risk within 50m	**1 in 30 year, Greater than 1.0m**

Ambiental Risk Analytics surface water (pluvial) FloodMap identifies areas likely to flood as a result of extreme rainfall events, i.e. land naturally vulnerable to surface water ponding or flooding. This data set was produced by simulating 1 in 30 year, 1 in 100 year, 1 in 250 year and 1 in 1,000 year rainfall events. Modern urban drainage systems are typically built to cope with rainfall events between 1 in 20 and 1 in 30 years, though some older ones may flood in a 1 in 5 year rainfall event.

Features are displayed on the Surface water flooding map on **page 54**

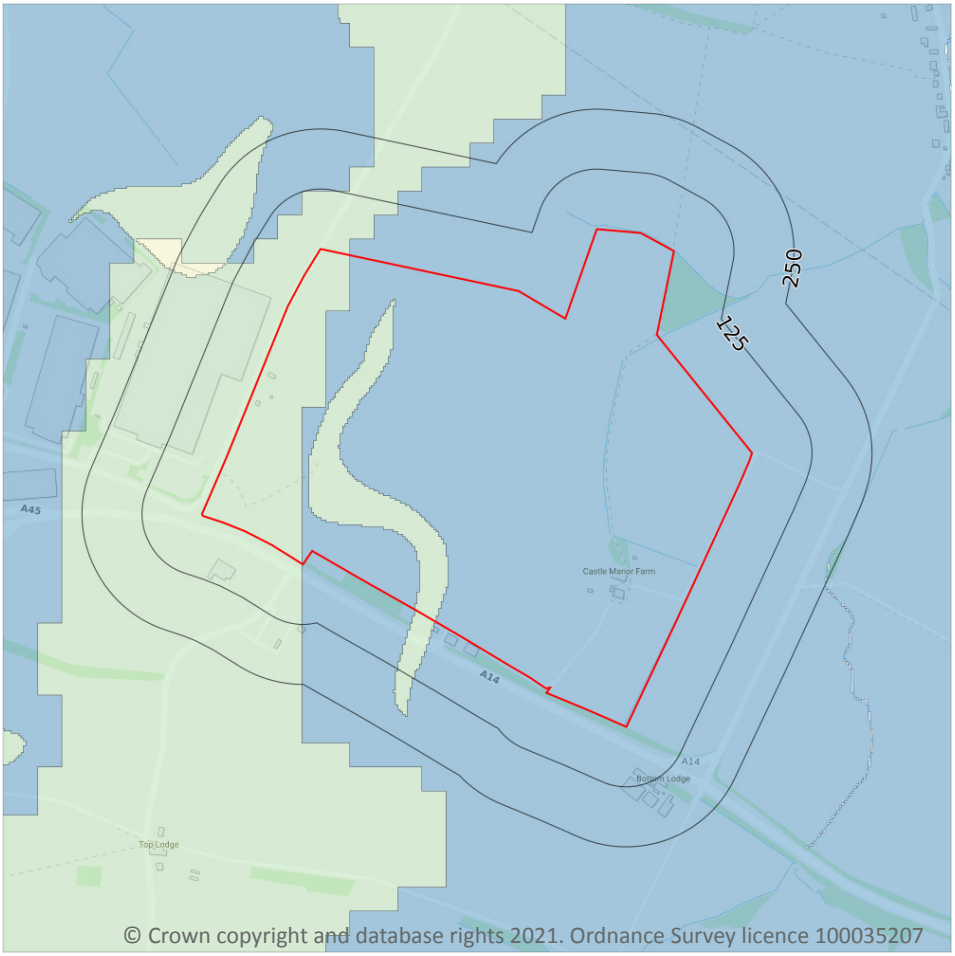
The data shown on the map and in the table above shows the highest likelihood of flood events happening at the site. Lower likelihood events may have greater flood depths and hence a greater potential impact on

a site. The table below shows the maximum flood depths for a range of return periods for the site.

Return period	Maximum modelled depth
1 in 1000 year	Greater than 1.0m
1 in 250 year	Greater than 1.0m
1 in 100 year	Greater than 1.0m
1 in 30 year	Greater than 1.0m

This data is sourced from Ambiental Risk Analytics.

9 Groundwater flooding



Site Outline

Search buffers in metres (m)

- High
- Moderate - High
- Moderate
- Low
- Negligible

9.1 Groundwater flooding

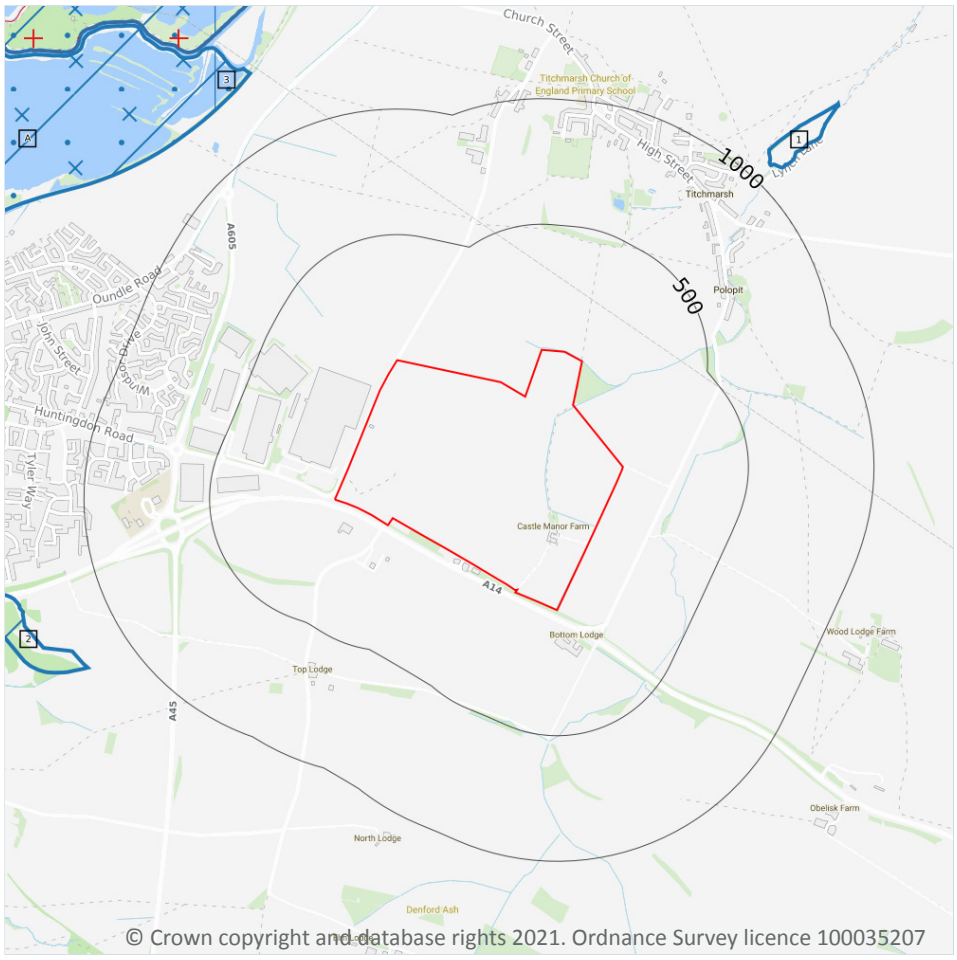
Highest risk on site	**Low**
Highest risk within 50m	**Low**

Groundwater flooding is caused by unusually high groundwater levels. It occurs when the water table rises above the ground surface or within underground structures such as basements or cellars. Groundwater flooding tends to exhibit a longer duration than surface water flooding, possibly lasting for weeks or months, and as a result it can cause significant damage to property. This risk assessment is based on a 1 in 100 year return period and a 5m Digital Terrain Model (DTM).

Features are displayed on the Groundwater flooding map on **page 56**

This data is sourced from Ambiental Risk Analytics.

10 Environmental designations



Site Outline

Search buffers in metres (m)

Sites of Special Scientific Interest (SSSI)

Conserved wetland sites (Ramsar sites)

Special Protection Areas (SPA)

Local Nature Reserves (LNR)

10.1 Sites of Special Scientific Interest (SSSI)

Records within 2000m	4

Sites providing statutory protection for the best examples of UK flora, fauna, or geological or physiographical features. Originally notified under the National Parks and Access to the Countryside Act 1949, SSSIs were re-notified under the Wildlife and Countryside Act 1981. Improved provisions for the protection and management of SSSIs were introduced by the Countryside and Rights of Way Act 2000 (in England and Wales) and (in Scotland) by the Nature Conservation (Scotland) Act 2004 and the Wildlife and Natural Environment (Scotland) Act 2010.

Features are displayed on the Environmental designations map on **page 57**

ID	Location	Name	Data source
1	1083m NE	Titchmarsh Meadow	Natural England

ID	Location	Name	Data source
2	1192m SW	Thrapston Station Quarry	Natural England
A	1227m NW	Upper Nene Valley Gravel Pits	Natural England
B	1470m NW	Upper Nene Valley Gravel Pits	Natural England

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.2 Conserved wetland sites (Ramsar sites)

Records within 2000m	**2**

Ramsar sites are designated under the Convention on Wetlands of International Importance, agreed in Ramsar, Iran, in 1971. They cover all aspects of wetland conservation and wise use, recognizing wetlands as ecosystems that are extremely important for biodiversity conservation in general and for the well-being of human communities. These sites cover a broad definition of wetland; marsh, fen, peatland or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, and even some marine areas.

Features are displayed on the Environmental designations map on **page 57**

ID	Location	Site	Details
A	1227m NW	Name: Upper Nene Valley Gravel Pits Site status: Listed Data source: Natural England	Overview: This chain of both active and disused sand and gravel pits form an extensive series of shallow and deep open waters which occur in association with a wide range of marginal features, such as sparsely-vegetated islands, gravel bars and shorelines and habitats including reedswamp, marsh, wet ditches, rush pasture, rough grassland and scattered scrub. This range of habitats and the varied topography of the lagoons provide valuable resting and feeding conditions for concentrations of wintering waterbirds, especially ducks and waders. Species such as golden plover Pluvialis apricaria and lapwing Vanellus vanellus also spend time feeding and roosting on surrounding agricultural land outside the Ramsar site. Ramsar criteria: -

ID	Location	Site	Details
B	1470m NW	Name: Upper Nene Valley Gravel Pits Site status: Listed Data source: Natural England	Overview: This chain of both active and disused sand and gravel pits form an extensive series of shallow and deep open waters which occur in association with a wide range of marginal features, such as sparsely-vegetated islands, gravel bars and shorelines and habitats including reedswamp, marsh, wet ditches, rush pasture, rough grassland and scattered scrub. This range of habitats and the varied topography of the lagoons provide valuable resting and feeding conditions for concentrations of wintering waterbirds, especially ducks and waders. Species such as golden plover Pluvialis apricaria and lapwing Vanellus vanellus also spend time feeding and roosting on surrounding agricultural land outside the Ramsar site. Ramsar criteria: -

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.3 Special Areas of Conservation (SAC)

Records within 2000m	**0**

Areas which have been identified as best representing the range and variety within the European Union of habitats and (non-bird) species listed on Annexes I and II to the Directive. SACs are designated under the EC Habitats Directive.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.4 Special Protection Areas (SPA)

Records within 2000m	**4**

Sites classified by the UK Government under the EC Birds Directive, SPAs are areas of the most important habitat for rare (listed on Annex I to the Directive) and migratory birds within the European Union.

Features are displayed on the Environmental designations map on **page 57**

ID	Location	Name	Species of interest	Habitat description	Data source
A	1227m NW	Upper Nene Valley Gravel Pits	Great crested grebe; Great cormorant; Great bittern; Eurasian wigeon; Gadwall; Mallard; Northern shoveler; Common pochard; Tufted duck; Common coot; European golden plover; Northern lapwing	Inland water bodies (Standing water, Running water); Bogs, Marshes, Water fringed vegetation, Fens; Broad-leaved deciduous woodland; Improved grassland	Natural England

ID	Location	Name	Species of interest	Habitat description	Data source
3	1231m NW	Upper Nene Valley Gravel Pits	Great crested grebe; Great cormorant; Great bittern; Eurasian wigeon; Gadwall; Mallard; Northern shoveler; Common pochard; Tufted duck; Common coot; European golden plover; Northern lapwing	Inland water bodies (Standing water, Running water); Bogs, Marshes, Water fringed vegetation, Fens; Broad-leaved deciduous woodland; Improved grassland	Natural England
4	1470m NW	Upper Nene Valley Gravel Pits	Great crested grebe; Great cormorant; Great bittern; Eurasian wigeon; Gadwall; Mallard; Northern shoveler; Common pochard; Tufted duck; Common coot; European golden plover; Northern lapwing	Inland water bodies (Standing water, Running water); Bogs, Marshes, Water fringed vegetation, Fens; Broad-leaved deciduous woodland; Improved grassland	Natural England
6	1486m NW	Upper Nene Valley Gravel Pits	Great crested grebe; Great cormorant; Great bittern; Eurasian wigeon; Gadwall; Mallard; Northern shoveler; Common pochard; Tufted duck; Common coot; European golden plover; Northern lapwing	Inland water bodies (Standing water, Running water); Bogs, Marshes, Water fringed vegetation, Fens; Broad-leaved deciduous woodland; Improved grassland	Natural England

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.5 National Nature Reserves (NNR)

Records within 2000m	**0**

Sites containing examples of some of the most important natural and semi-natural terrestrial and coastal ecosystems in Great Britain. They are managed to conserve their habitats, provide special opportunities for scientific study or to provide public recreation compatible with natural heritage interests.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.6 Local Nature Reserves (LNR)

Records within 2000m	**1**

Sites managed for nature conservation, and to provide opportunities for research and education, or simply enjoying and having contact with nature. They are declared by local authorities under the National Parks and Access to the Countryside Act 1949 after consultation with the relevant statutory nature conservation agency.

Features are displayed on the Environmental designations map on **page 57**

ID	Location	Name	Data source
5	1470m NW	Titchmarsh	Natural England

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.7 Designated Ancient Woodland

Records within 2000m	0

Ancient woodlands are classified as areas which have been wooded continuously since at least 1600 AD. This includes semi-natural woodland and plantations on ancient woodland sites. 'Wooded continuously' does not mean there is or has previously been continuous tree cover across the whole site, and not all trees within the woodland have to be old.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.8 Biosphere Reserves

Records within 2000m	0

Biosphere Reserves are internationally recognised by UNESCO as sites of excellence to balance conservation and socioeconomic development between nature and people. They are recognised under the Man and the Biosphere (MAB) Programme with the aim of promoting sustainable development founded on the work of the local community.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.9 Forest Parks

Records within 2000m	0

These are areas managed by the Forestry Commission designated on the basis of recreational, conservation or scenic interest.

This data is sourced from the Forestry Commission.

10.10 Marine Conservation Zones

Records within 2000m	0

A type of marine nature reserve in UK waters established under the Marine and Coastal Access Act (2009). They are designated with the aim to protect nationally important, rare or threatened habitats and species.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.11 Green Belt

Records within 2000m	0

Areas designated to prevent urban sprawl by keeping land permanently open.

This data is sourced from the Ministry of Housing, Communities and Local Government.

10.12 Proposed Ramsar sites

Records within 2000m	0

Ramsar sites are areas listed as a Wetland of International Importance under the Convention on Wetlands of International Importance especially as Waterfowl Habitat (the Ramsar Convention) 1971. The sites here supplied have a status of 'Proposed' having been identified for potential adoption under the framework.

This data is sourced from Natural England.

10.13 Possible Special Areas of Conservation (pSAC)

Records within 2000m	0

Special Areas of Conservation are areas which have been identified as best representing the range and variety within the European Union of habitats and (non-bird) species listed on Annexes I and II to the Directive. SACs are designated under the EC Habitats Directive. Those sites supplied here are those with a status of 'Possible' having been identified for potential adoption under the framework.

This data is sourced from Natural England and Natural Resources Wales.

10.14 Potential Special Protection Areas (pSPA)

Records within 2000m	0

Special Protection Areas (SPAs) are areas designated (or ‘classified’) under the European Union Wild Birds Directive for the protection of nationally and internationally important populations of wild birds. Those sites supplied here are those with a status of 'Potential' having been identified for potential adoption under the framework.

This data is sourced from Natural England.

10.15 Nitrate Sensitive Areas

Records within 2000m	0

Areas where nitrate concentrations in drinking water sources exceeded or was at risk of exceeding the limit of 50 mg/l set by the 1980 EC Drinking Water Directive. Voluntary agricultural measures as a means of reducing the levels of nitrate were introduced by DEFRA as MAFF, with payments being made to farmers who complied. The scheme was started as a pilot in 1990 in ten areas, later implemented within 32 areas.

The scheme was closed to further new entrants in 1998, although existing agreements continued for their full term. All Nitrate Sensitive Areas fell within the areas designated as Nitrate Vulnerable Zones (NVZs) in 1996 under the EC Nitrate Directive (91/676/EEC).

This data is sourced from Natural England.

10.16 Nitrate Vulnerable Zones

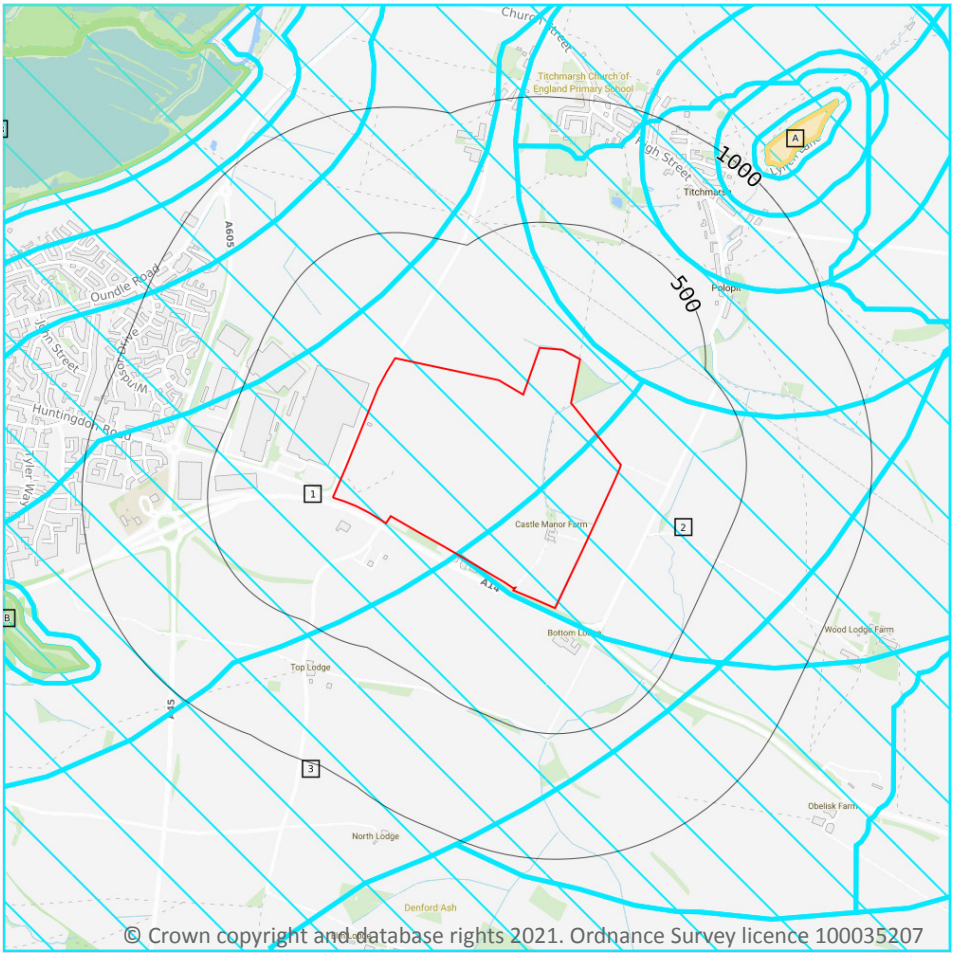
Records within 2000m	**7**

Areas at risk from agricultural nitrate pollution designated under the EC Nitrate Directive (91/676/EEC). These are areas of land that drain into waters polluted by nitrates. Farmers operating within these areas have to follow mandatory rules to tackle nitrate loss from agriculture.

Location	Name	Type	NVZ ID	Status
On site	**River Nene NVZ**	**Surface Water**	**S382**	**Existing**
On site	**Thrapstone lake Eutrophic lake NVZ**	**Eutrophic Water**	**EL148**	**New**
49m W	Northampton Sands	Groundwater	G165	New
1653m SE	Great Ouse NVZ	Surface Water	S391	Existing
1729m NE	River Nene NVZ	Surface Water	S382	Existing
1776m SW	River Nene NVZ	Surface Water	S382	Existing
1958m S	Great Ouse NVZ	Surface Water	S391	Existing

This data is sourced from Natural England and Natural Resources Wales.

SSSI Impact Zones and Units



Site Outline

Search buffers in metres (m)

SSSI Impact Risk Zones

SSSI Units

- Not recorded
- Favourable
- Unfavourable - Recovering
- Unfavourable - No change
- Unfavourable - Declining
- Partially destroyed
- Destroyed

10.17 SSSI Impact Risk Zones

Records on site	3

Developed to allow rapid initial assessment of the potential risks to SSSIs posed by development proposals. They define zones around each SSSI which reflect the particular sensitivities of the features for which it is notified and indicate the types of development proposal which could potentially have adverse impacts.

Features are displayed on the SSSI Impact Zones and Units map on **page 64**

ID	Location	Type of developments requiring consultation
1	On site	**Infrastructure - Pipelines, pylons and overhead cables. Any transport proposal including road, rail and by water (excluding routine maintenance). Airports, helipads and other aviation proposals Wind and Solar - Solar schemes with footprint > 0.5ha, all wind turbines Minerals, Oil and Gas - Planning applications for quarries, including: new proposals, Review of Minerals Permissions (ROMP), extensions, variations to conditions etc. Oil & gas exploration/extraction. Rural non-residential - Large non residential developments outside existing settlements/urban areas where net additional gross internal floorspace is > 1,000m² or footprint exceeds 0.2ha Residential - Any residential developments with a total net gain in residential units Rural residential - Any residential developments outside of existing settlements/urban areas with a total net gain in residential units Air pollution - Any industrial/agricultural development that could cause AIR POLLUTION (incl: industrial processes, livestock & poultry units with floorspace > 500m², slurry lagoons > 200m² & manure stores > 250t). Combustion - General combustion processes >20MW energy input. Incl: energy from waste incineration, other incineration, landfill gas generation plant, pyrolysis/gasification, anaerobic digestion, sewage treatment works, other incineration/ combustion Waste - Landfill. Incl: inert landfill, non-hazardous landfill, hazardous landfill. Composting - Any composting proposal with more than 75000 tonnes maximum annual operational throughput. Incl: open windrow composting, in-vessel composting, anaerobic digestion, other waste management Discharges - Any discharge of water or liquid waste of more than 5m³/day to ground (ie to seep away) or to surface water, such as a beck or stream (NB This does not include discharges to mains sewer which are unlikely to pose a risk at this location). Water supply - Large infrastructure such as warehousing / industry where total net additional gross internal floorspace following development is 1,000m² or more.**
2	On site	**Infrastructure - Pipelines, pylons and overhead cables. Any transport proposal including road, rail and by water (excluding routine maintenance). Airports, helipads and other aviation proposals Wind and Solar - Solar schemes with footprint > 0.5ha, all wind turbines Minerals, Oil and Gas - Planning applications for quarries, including: new proposals, Review of Minerals Permissions (ROMP), extensions, variations to conditions etc. Oil & gas exploration/extraction. Rural non-residential - Large non residential developments outside existing settlements/urban areas where footprint exceeds 1ha. Residential - Any residential developments with a total net gain in residential units Rural residential - Any residential developments outside of existing settlements/urban areas with a total net gain in residential units Air pollution - Any industrial/agricultural development that could cause AIR POLLUTION (incl: industrial processes, livestock & poultry units with floorspace > 500m², slurry lagoons > 200m² & manure stores > 250t). Combustion - General combustion processes >20MW energy input. Incl: energy from waste incineration, other incineration, landfill gas generation plant, pyrolysis/gasification, anaerobic digestion, sewage treatment works, other incineration/ combustion Waste - Landfill. Incl: inert landfill, non-hazardous landfill, hazardous landfill. Composting - Any composting proposal with more than 75000 tonnes maximum annual operational throughput. Incl: open windrow composting, in-vessel composting, anaerobic digestion, other waste management Discharges - Any discharge of water or liquid waste of more than 5m³/day to ground (ie to seep away) or to surface water, such as a beck or stream (NB This does not include discharges to mains sewer which are unlikely to pose a risk at this location). Water supply - Large infrastructure such as warehousing / industry where total net additional gross internal floorspace following development is 1,000m² or more.**

ID	Location	Type of developments requiring consultation
3	**On site**	**Infrastructure - Pipelines, pylons and overhead cables. Any transport proposal including road, rail and by water (excluding routine maintenance). Airports, helipads and other aviation proposals** **Wind and Solar - Solar schemes with footprint > 0.5ha, all wind turbines** **Minerals, Oil and Gas - Planning applications for quarries, including: new proposals, Review of Minerals Permissions (ROMP), extensions, variations to conditions etc. Oil & gas exploration/extraction.** **Rural non-residential - Large non residential developments outside existing settlements/urban areas where footprint exceeds 1ha.** **Residential - Any residential developments with a total net gain in residential units** **Rural residential - Any residential developments outside of existing settlements/urban areas with a total net gain in residential units** **Air pollution - Any industrial/agricultural development that could cause AIR POLLUTION (incl: industrial processes, livestock & poultry units with floorspace > 500m², slurry lagoons > 750m² & manure stores > 3500t)** **Combustion - General combustion processes >50MW energy input. Incl: energy from waste incineration, other incineration, landfill gas generation plant, pyrolysis/gasification, anaerobic digestion, sewage treatment works, other incineration/ combustion** **Waste - Landfill. Incl: inert landfill, non-hazardous landfill, hazardous landfill.** **Discharges - Any discharge of water or liquid waste of more than 5m³/day to ground (ie to seep away) or to surface water, such as a beck or stream (NB This does not include discharges to mains sewer which are unlikely to pose a risk at this location).**

This data is sourced from Natural England.

10.18 SSSI Units

Records within 2000m	**4**

Divisions of SSSIs used to record management and condition details. Units are the smallest areas for which Natural England gives a condition assessment, however, the size of units varies greatly depending on the types of management and the conservation interest.

Features are displayed on the SSSI Impact Zones and Units map on **page 64**

ID: A
Location: 1083m NE
SSSI name: Titchmarsh Meadow
Unit name: Whole Site
Broad habitat: Neutral Grassland - Lowland
Condition: Unfavourable - No change
Reportable features:

Feature name	Feature condition	Date of assessment
Basin fen (lowland)	Unfavourable - No change	27/02/2009

ID: B
Location: 1192m SW
SSSI name: Thrapston Station Quarry
Unit name: Whole Site
Broad habitat: Earth Heritage
Condition: Favourable
Reportable features:

Feature name	Feature condition	Date of assessment
ED - Bathonian	Favourable	04/01/2017

ID: 18
Location: 1227m NW
SSSI name: Upper Nene Valley Gravel Pits
Unit name: Thrapston Gravel Pits
Broad habitat: Standing Open Water And Canals
Condition: Favourable
Reportable features:

Feature name	Feature condition	Date of assessment
>20,000 Non-breeding waterbirds	Favourable	30/11/2009
Aggregations of breeding birds - Grey heron, Ardea cinerea	Favourable	30/11/2009
Aggregations of non-breeding birds - Bittern, Botaurus stellaris	Favourable	30/11/2009
Aggregations of non-breeding birds - Coot, Fulica atra	Favourable	30/11/2009
Aggregations of non-breeding birds - Cormorant, Phalacrocorax carbo carbo	Favourable	30/11/2009
Aggregations of non-breeding birds - Gadwall, Anas strepera	Favourable	30/11/2009
Aggregations of non-breeding birds - Golden plover, Pluvialis apricaria	Favourable	30/11/2009
Aggregations of non-breeding birds - Great crested grebe, Podiceps cristatus	Favourable	30/11/2009
Aggregations of non-breeding birds - Mute swan, Cygnus olor	Favourable	30/11/2009
Aggregations of non-breeding birds - Pochard, Aythya ferina	Favourable	30/11/2009
Aggregations of non-breeding birds - Shoveler, Anas clypeata	Favourable	30/11/2009
Aggregations of non-breeding birds - Tufted duck, Aythya fuligula	Favourable	30/11/2009
Aggregations of non-breeding birds - Wigeon, Anas penelope	Favourable	30/11/2009
Assemblages of breeding birds - Lowland open waters and their margins	Favourable	30/11/2009

ID: 24
Location: 1470m NW
SSSI name: Upper Nene Valley Gravel Pits
Unit name: Thrapston Gravel Pits
Broad habitat: Standing Open Water And Canals
Condition: Favourable
Reportable features:

Feature name	Feature condition	Date of assessment
>20,000 Non-breeding waterbirds	Favourable	30/11/2009
Aggregations of breeding birds - Grey heron, Ardea cinerea	Favourable	30/11/2009
Aggregations of non-breeding birds - Bittern, Botaurus stellaris	Favourable	30/11/2009
Aggregations of non-breeding birds - Coot, Fulica atra	Favourable	30/11/2009
Aggregations of non-breeding birds - Cormorant, Phalacrocorax carbo carbo	Favourable	30/11/2009
Aggregations of non-breeding birds - Gadwall, Anas strepera	Favourable	30/11/2009
Aggregations of non-breeding birds - Golden plover, Pluvialis apricaria	Favourable	30/11/2009
Aggregations of non-breeding birds - Great crested grebe, Podiceps cristatus	Favourable	30/11/2009
Aggregations of non-breeding birds - Mute swan, Cygnus olor	Favourable	30/11/2009
Aggregations of non-breeding birds - Pochard, Aythya ferina	Favourable	30/11/2009
Aggregations of non-breeding birds - Shoveler, Anas clypeata	Favourable	30/11/2009
Aggregations of non-breeding birds - Tufted duck, Aythya fuligula	Favourable	30/11/2009
Aggregations of non-breeding birds - Wigeon, Anas penelope	Favourable	30/11/2009
Assemblages of breeding birds - Lowland open waters and their margins	Favourable	30/11/2009

This data is sourced from Natural England and Natural Resources Wales.

11 Visual and cultural designations

11.1 World Heritage Sites

Records within 250m	0

Sites designated for their globally important cultural or natural interest requiring appropriate management and protection measures. World Heritage Sites are designated to meet the UK's commitments under the World Heritage Convention.

This data is sourced from Historic England, Cadw and Historic Environment Scotland.

11.2 Area of Outstanding Natural Beauty

Records within 250m	0

Areas of Outstanding Natural Beauty (AONB) are conservation areas, chosen because they represent 18% of the finest countryside. Each AONB has been designated for special attention because of the quality of their flora, fauna, historical and cultural associations, and/or scenic views. The National Parks and Access to the Countryside Act of 1949 created AONBs and the Countryside and Rights of Way Act, 2000 added further regulation and protection. There are likely to be restrictions to some developments within these areas.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

11.3 National Parks

Records within 250m	0

In England and Wales, the purpose of National Parks is to conserve and enhance landscapes within the countryside whilst promoting public enjoyment of them and having regard for the social and economic well-being of those living within them. In Scotland National Parks have the additional purpose of promoting the sustainable use of the natural resources of the area and the sustainable social and economic development of its communities. The National Parks and Access to the Countryside Act 1949 established the National Park designation in England and Wales, and The National Parks (Scotland) Act 2000 in Scotland.

This data is sourced from Natural England, Natural Resources Wales and the Scottish Government.

11.4 Listed Buildings

Records within 250m	0

Buildings listed for their special architectural or historical interest. Building control in the form of 'listed building consent' is required in order to make any changes to that building which might affect its special interest. Listed buildings are graded to indicate their relative importance, however building controls apply to all buildings equally, irrespective of their grade, and apply to the interior and exterior of the building in its entirety, together with any curtilage structures.

This data is sourced from Historic England, Cadw and Historic Environment Scotland.

11.5 Conservation Areas

Records within 250m	0

Local planning authorities are obliged to designate as conservation areas any parts of their own area that are of special architectural or historic interest, the character and appearance of which it is desirable to preserve or enhance. Designation of a conservation area gives broader protection than the listing of individual buildings. All the features within the area, listed or otherwise, are recognised as part of its character. Conservation area designation is the means of recognising the importance of all factors and of ensuring that planning decisions address the quality of the landscape in its broadest sense.

This data is sourced from Historic England, Cadw and Historic Environment Scotland.

11.6 Scheduled Ancient Monuments

Records within 250m	0

A scheduled monument is an historic building or site that is included in the Schedule of Monuments kept by the Secretary of State for Digital, Culture, Media and Sport. The regime is set out in the Ancient Monuments and Archaeological Areas Act 1979. The Schedule of Monuments has c.20,000 entries and includes sites such as Roman remains, burial mounds, castles, bridges, earthworks, the remains of deserted villages and industrial sites. Monuments are not graded, but all are, by definition, considered to be of national importance.

This data is sourced from Historic England, Cadw and Historic Environment Scotland.

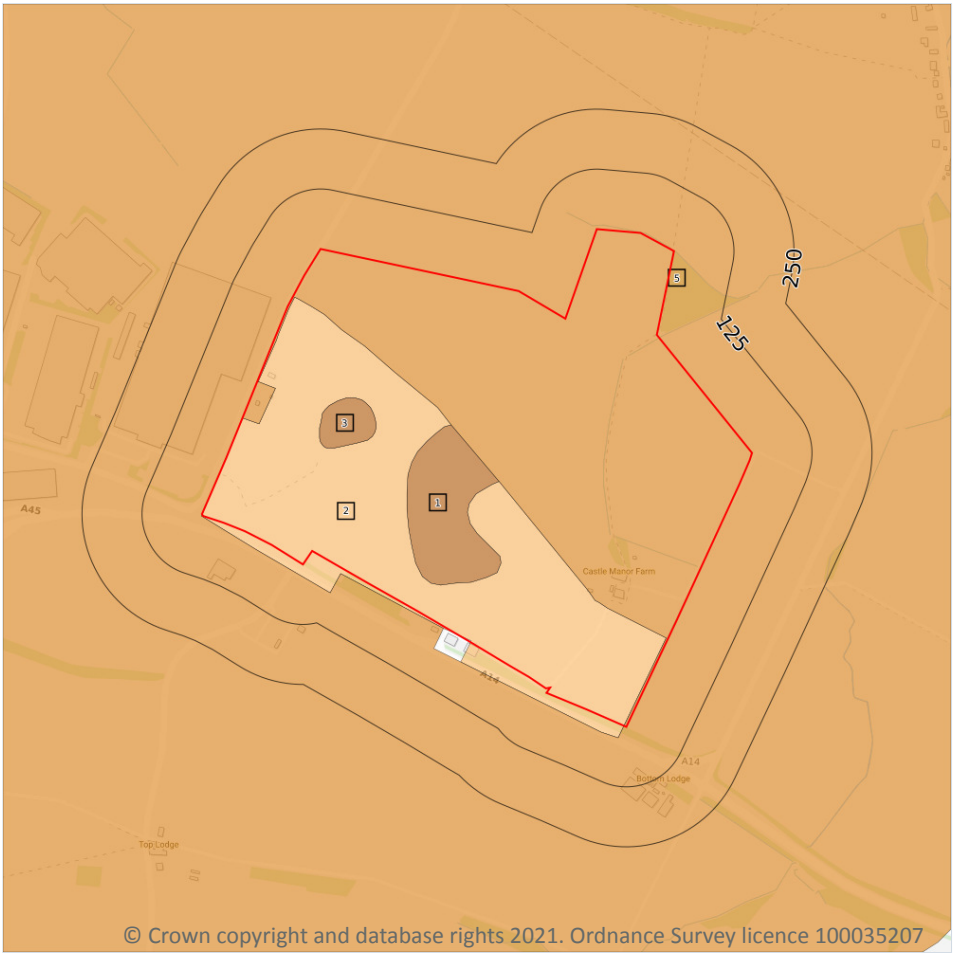
11.7 Registered Parks and Gardens

Records within 250m	0

Parks and gardens assessed to be of particular interest and of special historic interest. The emphasis being on 'designed' landscapes, rather than on planting or botanical importance. Registration is a 'material consideration' in the planning process, meaning that planning authorities must consider the impact of any proposed development on the special character of the landscape.

This data is sourced from Historic England, Cadw and Historic Environment Scotland.

12 Agricultural designations



Site Outline

Search buffers in metres (m)

- Grade 1 - excellent quality
- Grade 2 - very good quality
- Grade 3 - good to moderate quality
- Grade 3a - good quality
- Grade 3b - moderate quality
- Grade 4 - poor quality
- Grade 5 - very poor quality
- Non-agricultural land
- Urban land
- Exclusion land
- Tree felling licences
- Open Access land

12.1 Agricultural Land Classification

Records within 250m	4

Classification of the quality of agricultural land taking into consideration multiple factors including climate, physical geography and soil properties. It should be noted that the categories for the grading of agricultural land are not consistent across England, Wales and Scotland.

Features are displayed on the Agricultural designations map on **page 71**

ID	Location	Classification	Description
1	On site	Grade 2	Very good quality agricultural land. Land with minor limitations which affect crop yield, cultivations or harvesting. A wide range of agricultural and horticultural crops can usually be grown but on some land in the grade there may be reduced flexibility due to difficulties with the production of the more demanding crops such as winter harvested vegetables and arable root crops. The level of yield is generally high but may be lower or more variable than Grade 1.
2	On site	Grade 3a	Good quality agricultural land. Land capable of consistently producing moderate to high yields of a narrow range of arable crops, especially cereals, or moderate yields of a wide range of crops including cereals, grass, oilseed rape, potatoes, sugar beet and the less demanding horticultural crops.
3	On site	Grade 2	Very good quality agricultural land. Land with minor limitations which affect crop yield, cultivations or harvesting. A wide range of agricultural and horticultural crops can usually be grown but on some land in the grade there may be reduced flexibility due to difficulties with the production of the more demanding crops such as winter harvested vegetables and arable root crops. The level of yield is generally high but may be lower or more variable than Grade 1.
5	On site	Grade 3	Good to moderate quality agricultural land. Land with moderate limitations which affect the choice of crops, timing and type of cultivation, harvesting or the level of yield. Where more demanding crops are grown yields are generally lower or more variable than on land in Grades 1 and 2.

This data is sourced from Natural England.

12.2 Open Access Land

Records within 250m	0

The Countryside and Rights of Way Act 2000 (CROW Act) gives a public right of access to land without having to use paths. Access land includes mountains, moors, heaths and downs that are privately owned. It also includes common land registered with the local council and some land around the England Coast Path. Generally permitted activities on access land are walking, running, watching wildlife and climbing.

This data is sourced from Natural England and Natural Resources Wales.

12.3 Tree Felling Licences

Records within 250m	0

Felling Licence Application (FLA) areas approved by Forestry Commission England. Anyone wishing to fell trees must ensure that a licence or permission under a grant scheme has been issued by the Forestry Commission before any felling is carried out or that one of the exceptions apply.

This data is sourced from the Forestry Commission.

12.4 Environmental Stewardship Schemes

Records within 250m	3

Environmental Stewardship covers a range of schemes that provide financial incentives to farmers, foresters and land managers to look after and improve the environment. The schemes identified may be historical schemes that have now expired, or may still be active.

Location	Reference	Scheme	Start Date	End date
On site	**AG00521271**	**Entry Level Stewardship**	**01/11/2013**	**31/10/2018**
45m S	AG00521271	Entry Level Stewardship	01/11/2013	31/10/2018
47m W	AG00521271	Entry Level Stewardship	01/11/2013	31/10/2018

This data is sourced from Natural England.

12.5 Countryside Stewardship Schemes

Records within 250m	4

Countryside Stewardship covers a range of schemes that provide financial incentives to farmers, foresters and land managers to look after and improve the environment. Main objectives are to improve the farmed environment for wildlife and to reduce diffuse water pollution.

Location	Reference	Scheme	Start Date	End Date
45m S	645118	Countryside Stewardship (Middle Tier)	01/01/2019	31/12/2023
49m W	645118	Countryside Stewardship (Middle Tier)	01/01/2019	31/12/2023
88m SE	646090	Countryside Stewardship (Middle Tier)	01/01/2019	31/12/2020
215m SE	645118	Countryside Stewardship (Middle Tier)	01/01/2019	31/12/2023

This data is sourced from Natural England.

13 Habitat designations

13.1 Priority Habitat Inventory

Records within 250m	0

Habitats of principal importance as named under Natural Environment and Rural Communities Act (2006) Section 41.

This data is sourced from Natural England.

13.2 Habitat Networks

Records within 250m	0

Habitat networks for 18 priority habitat networks (based primarily, but not exclusively, on the priority habitat inventory) and areas suitable for the expansion of networks through restoration and habitat creation.

This data is sourced from Natural England.

13.3 Open Mosaic Habitat

Records within 250m	0

Sites verified as Open Mosaic Habitat. Mosaic habitats are brownfield sites that are identified under the UK Biodiversity Action Plan as a priority habitat due to the habitat variation within a single site, supporting an array of invertebrates.

This data is sourced from Natural England.

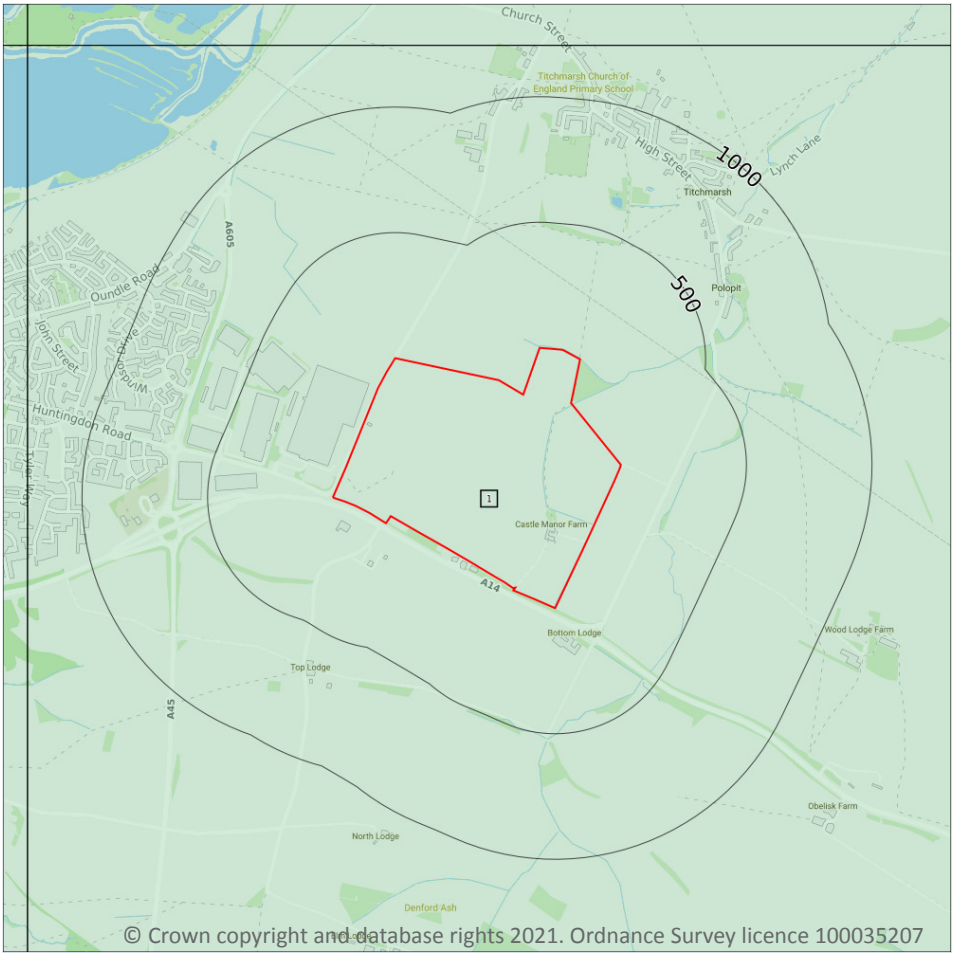
13.4 Limestone Pavement Orders

Records within 250m	0

Limestone pavements are outcrops of limestone where the surface has been worn away by natural means over millennia. These rocks have the appearance of paving blocks, hence their name. Not only do they have geological interest, they also provide valuable habitats for wildlife. These habitats are threatened due to their removal for use in gardens and water features. Many limestone pavements have been designated as SSSIs which affords them some protection. In addition, Section 34 of the Wildlife and Countryside Act 1981 gave them additional protection via the creation of Limestone Pavement Orders, which made it a criminal offence to remove any part of the outcrop. The associated Limestone Pavement Priority Habitat is part of the UK Biodiversity Action Plan priority habitat in England.

This data is sourced from Natural England.

14 Geology 1:10,000 scale - Availability



Site Outline

Search buffers in metres (m)

Full coverage

Partial coverage

No coverage

14.1 10k Availability

Records within 500m	1

An indication on the coverage of 1:10,000 scale geology data for the site, the most detailed dataset provided by the British Geological Survey. Either 'Full', 'Partial' or 'No coverage' for each geological theme.

Features are displayed on the Geology 1:10,000 scale - Availability map on **page 75**

ID	Location	Artificial	Superficial	Bedrock	Mass movement	Sheet No.
1	**On site**	**Full**	**Full**	**Full**	**No coverage**	**TL07NW**

This data is sourced from the British Geological Survey.

Geology 1:10,000 scale - Artificial and made ground

Site Outline

Search buffers in metres (m)

- Reclaimed ground
- Made ground
- Worked ground
- Infilled ground
- Disturbed ground
- Landscaped ground

14.2 Artificial and made ground (10k)

Records within 500m	6

Details of made, worked, infilled, disturbed and landscaped ground at 1:10,000 scale. Artificial ground can be associated with potentially contaminated material, unpredictable engineering conditions and instability.

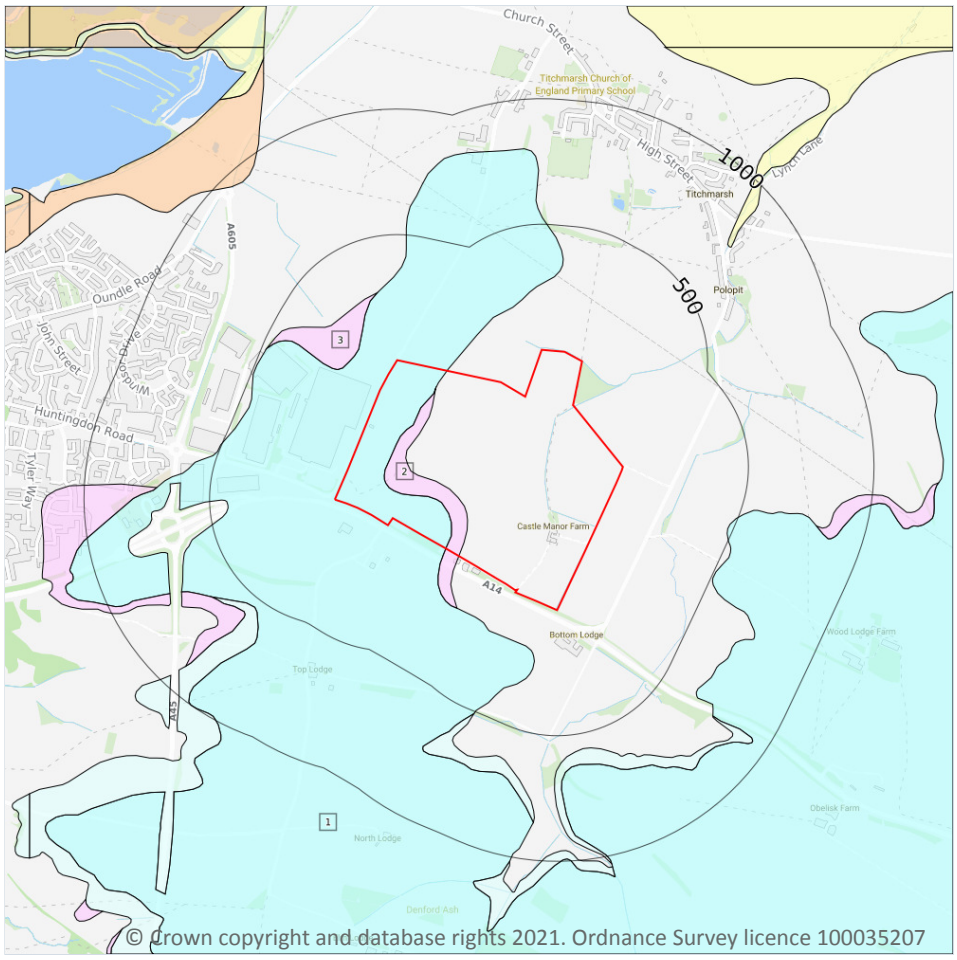
Features are displayed on the Geology 1:10,000 scale - Artificial and made ground map on **page 76**

ID	Location	LEX Code	Description	Rock description
1	**On site**	**WMGR-ARTDP**	**Infilled Ground**	**Artificial Deposit**
2	**On site**	**WMGR-ARTDP**	**Infilled Ground**	**Artificial Deposit**
3	7m SW	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit
4	308m SE	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit

ID	Location	LEX Code	Description	Rock description
5	327m W	WGR-VOID	Worked Ground (Undivided)	Void
A	480m E	WMGR-ARTDP	Infilled Ground	Artificial Deposit

This data is sourced from the British Geological Survey.

Geology 1:10,000 scale - Superficial



Site Outline

Search buffers in metres (m)

Landslip (10k)

Superficial geology (10k)
Please see table for more details.

14.3 Superficial geology (10k)

Records within 500m	3

Superficial geological deposits at 1:10,000 scale. Also known as 'drift', these are the youngest geological deposits, formed during the Quaternary. They rest on older deposits or rocks referred to as bedrock.

Features are displayed on the Geology 1:10,000 scale - Superficial map on **page 78**

ID	Location	LEX Code	Description	Rock description
1	**On site**	**ODT-DMTN**	**Oadby Member - Diamicton**	**Diamicton**
2	**On site**	**GFDU-XSV**	**Glaciofluvial Deposits - Sand And Gravel**	**Sand And Gravel**
3	153m NW	GFDU-XSV	Glaciofluvial Deposits - Sand And Gravel	Sand And Gravel

This data is sourced from the British Geological Survey.

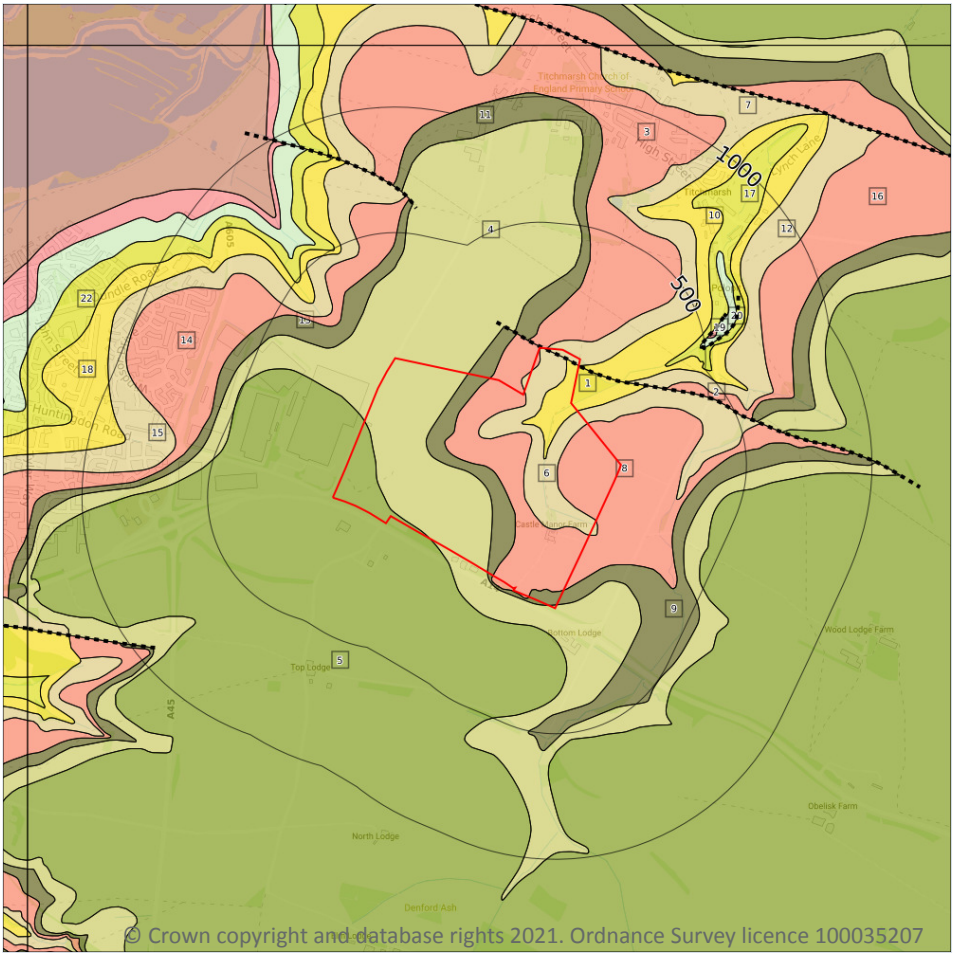
14.4 Landslip (10k)

Records within 500m	0

Mass movement deposits on BGS geological maps at 1:10,000 scale. Primarily superficial deposits that have moved down slope under gravity to form landslips. These affect bedrock, other superficial deposits and artificial ground.

This data is sourced from the British Geological Survey.

Geology 1:10,000 scale - Bedrock



Site Outline

Search buffers in metres (m)

Bedrock faults and other linear features (10k)

Bedrock geology (10k)
Please see table for more details.

14.5 Bedrock geology (10k)

Records within 500m **19**

Bedrock geology at 1:10,000 scale. The main mass of rocks forming the Earth and present everywhere, whether exposed at the surface in outcrops or concealed beneath superficial deposits or water.

Features are displayed on the Geology 1:10,000 scale - Bedrock map on **page 80**

ID	Location	LEX Code	Description	Rock age
1	**On site**	**BWL-LMST**	**Blisworth Limestone Formation - Limestone**	**Bathonian Age**
3	**On site**	**CB-LMST**	**Cornbrash Formation - Limestone**	**Callovian Age - Bathonian Age**
4	**On site**	**KLS-SDSL**	**Kellaways Sand Member - Sandstone And Siltstone, Interbedded**	**Callovian Age**

ID	Location	LEX Code	Description	Rock age
5	**On site**	**OXC-MDST**	**Oxford Clay Formation - Mudstone**	**Oxfordian Age - Callovian Age**
6	**On site**	**BWC-MDST**	**Blisworth Clay Formation - Mudstone**	**Bathonian Age**
7	**On site**	**BWC-MDST**	**Blisworth Clay Formation - Mudstone**	**Bathonian Age**
8	**On site**	**CB-LMST**	**Cornbrash Formation - Limestone**	**Callovian Age - Bathonian Age**
9	**On site**	**KLC-MDST**	**Kellaways Clay Member - Mudstone**	**Callovian Age**
10	1m E	BWL-LMST	Blisworth Limestone Formation - Limestone	Bathonian Age
11	50m NW	KLC-MDST	Kellaways Clay Member - Mudstone	Callovian Age
12	196m E	BWC-MDST	Blisworth Clay Formation - Mudstone	Bathonian Age
13	196m NW	KLC-MDST	Kellaways Clay Member - Mudstone	Callovian Age
14	265m NW	CB-LMST	Cornbrash Formation - Limestone	Callovian Age - Bathonian Age
15	313m NW	BWC-MDST	Blisworth Clay Formation - Mudstone	Bathonian Age
16	330m NE	CB-LMST	Cornbrash Formation - Limestone	Callovian Age - Bathonian Age
17	340m E	RLD-MDST	Rutland Formation - Mudstone	Bathonian Age - Bajocian Age
18	394m NW	BWL-LMST	Blisworth Limestone Formation - Limestone	Bathonian Age
20	482m E	STAM-SDSL	Stamford Member - Sandstone And Siltstone, Interbedded	Bathonian Age - Bajocian Age
22	490m NW	RLD-MDST	Rutland Formation - Mudstone	Bathonian Age - Bajocian Age

This data is sourced from the British Geological Survey.

14.6 Bedrock faults and other linear features (10k)

Records within 500m **3**

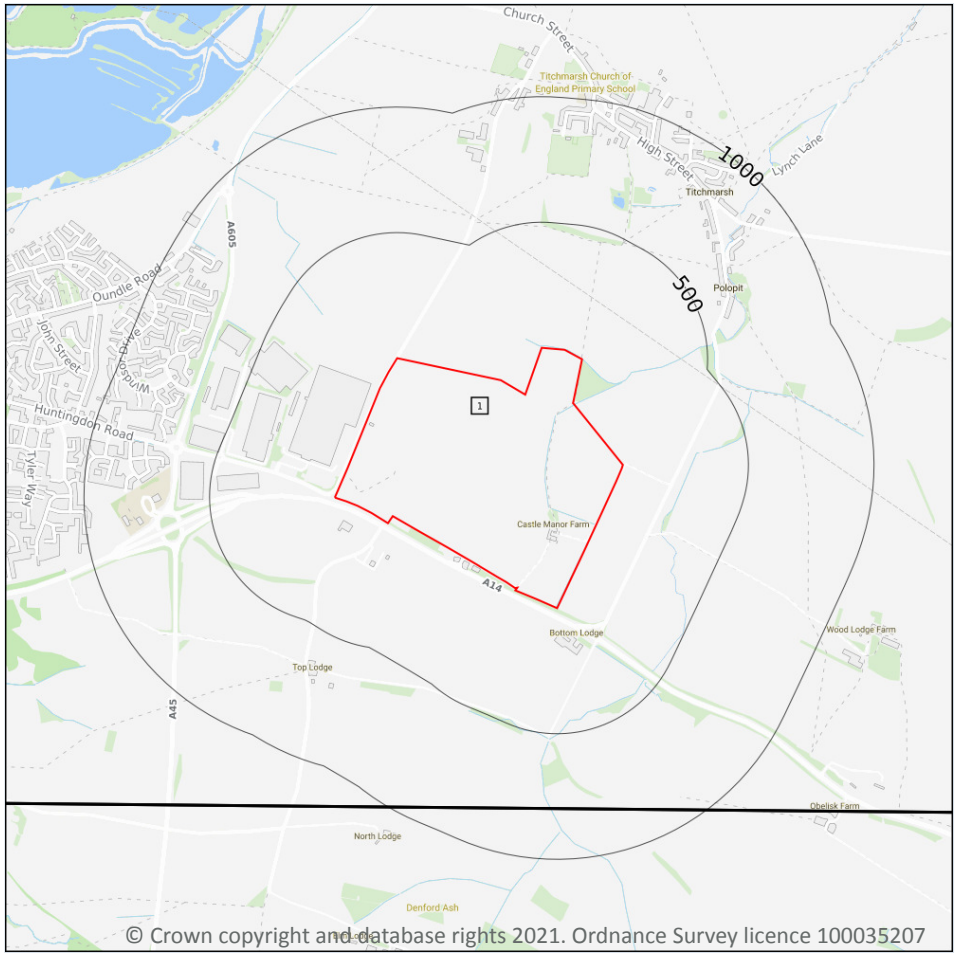
Linear features at the ground or bedrock surface at 1:10,000 scale of six main types; rock, fault, fold axis, mineral vein, alteration area or landform. Features are either observed or inferred, and relate primarily to bedrock.

Features are displayed on the Geology 1:10,000 scale - Bedrock map on **page 80**

ID	Location	Category	Description
2	**On site**	**FAULT**	**Normal fault, inferred**
19	482m E	FAULT	Normal fault, inferred
21	489m E	FAULT	Normal fault, inferred

This data is sourced from the British Geological Survey.

15 Geology 1:50,000 scale - Availability



Site Outline

Search buffers in metres (m)

Geological map tile

15.1 50k Availability

Records within 500m	1

An indication on the coverage of 1:50,000 scale geology data for the site. Either 'Full' or 'No coverage' for each geological theme.

Features are displayed on the Geology 1:50,000 scale - Availability map on **page 82**

ID	Location	Artificial	Superficial	Bedrock	Mass movement	Sheet No.
1	**On site**	**Full**	**Full**	**Full**	**Full**	**EW171_kettering_v4**

This data is sourced from the British Geological Survey.

Geology 1:50,000 scale - Artificial and made ground

15.2 Artificial and made ground (50k)

Records within 500m	0

Details of made, worked, infilled, disturbed and landscaped ground at 1:50,000 scale. Artificial ground can be associated with potentially contaminated material, unpredictable engineering conditions and instability.

This data is sourced from the British Geological Survey.

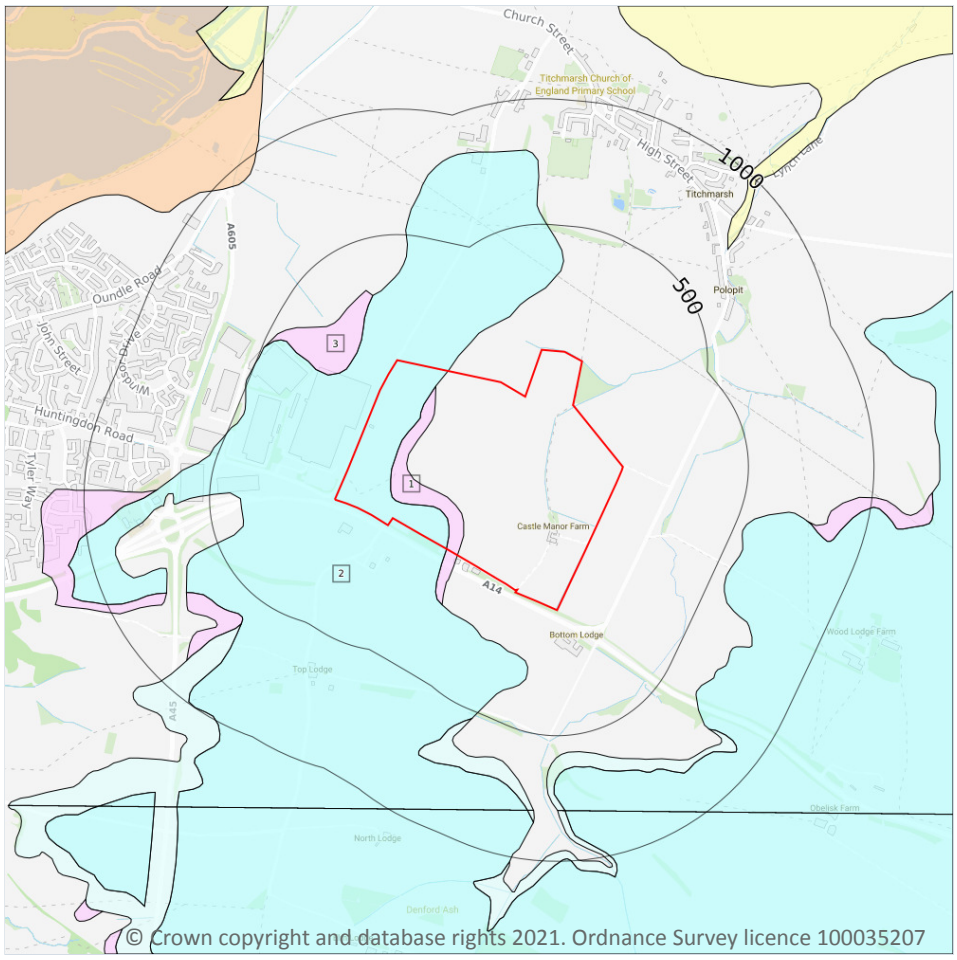
15.3 Artificial ground permeability (50k)

Records within 50m	0

A qualitative classification of estimated rates of vertical movement of water from the ground surface through the unsaturated zone of any artificial deposits (the zone between the land surface and the water table).

This data is sourced from the British Geological Survey.

Geology 1:50,000 scale - Superficial



Site Outline

Search buffers in metres (m)

Landslip (50k)

Superficial geology (50k)
Please see table for more details.

15.4 Superficial geology (50k)

Records within 500m	3

Superficial geological deposits at 1:50,000 scale. Also known as 'drift', these are the youngest geological deposits, formed during the Quaternary. They rest on older deposits or rocks referred to as bedrock.

Features are displayed on the Geology 1:50,000 scale - Superficial map on **page 84**

ID	Location	LEX Code	Description	Rock description
1	**On site**	**GFDMP-XSV**	**GLACIOFLUVIAL DEPOSITS, MID PLEISTOCENE**	**SAND AND GRAVEL**
2	**On site**	**ODT-DMTN**	**OADBY MEMBER**	**DIAMICTON**
3	152m NW	GFDMP-XSV	GLACIOFLUVIAL DEPOSITS, MID PLEISTOCENE	SAND AND GRAVEL

This data is sourced from the British Geological Survey.

15.5 Superficial permeability (50k)

Records within 50m	2

A qualitative classification of estimated rates of vertical movement of water from the ground surface through the unsaturated zone of any superficial deposits (the zone between the land surface and the water table).

Location	Flow type	Maximum permeability	Minimum permeability
On site	**Intergranular**	**Very High**	**High**
On site	**Mixed**	**Moderate**	**Low**

This data is sourced from the British Geological Survey.

15.6 Landslip (50k)

Records within 500m	0

Mass movement deposits on BGS geological maps at 1:50,000 scale. Primarily superficial deposits that have moved down slope under gravity to form landslips. These affect bedrock, other superficial deposits and artificial ground.

This data is sourced from the British Geological Survey.

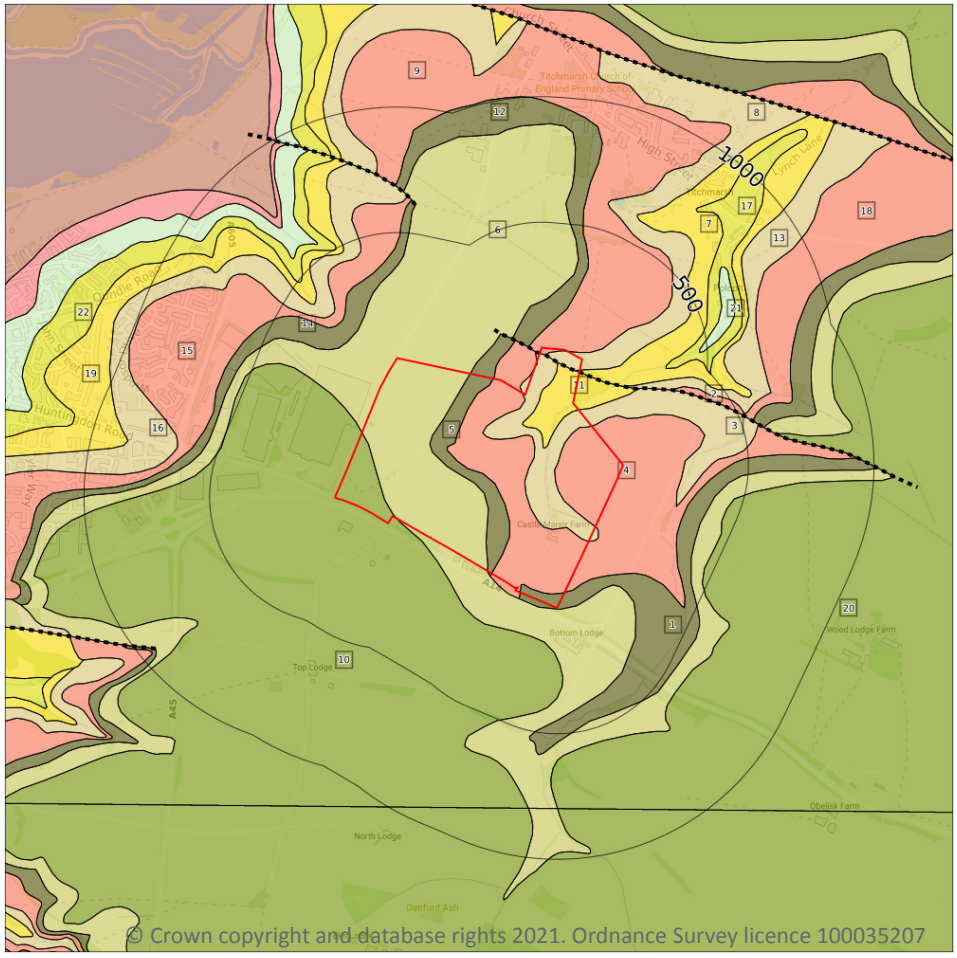
15.7 Landslip permeability (50k)

Records within 50m	0

A qualitative classification of estimated rates of vertical movement of water from the ground surface through the unsaturated zone of any landslip deposits (the zone between the land surface and the water table).

This data is sourced from the British Geological Survey.

Geology 1:50,000 scale - Bedrock



Site Outline

Search buffers in metres (m)

Bedrock faults and other linear features (50k)

Bedrock geology (50k)
Please see table for more details.

15.8 Bedrock geology (50k)

Records within 500m **21**

Bedrock geology at 1:50,000 scale. The main mass of rocks forming the Earth and present everywhere, whether exposed at the surface in outcrops or concealed beneath superficial deposits or water.

Features are displayed on the Geology 1:50,000 scale - Bedrock map on **page 86**

ID	Location	LEX Code	Description	Rock age
1	On site	KLC-MDST	KELLAWAYS CLAY MEMBER - MUDSTONE	CALLOVIAN
3	On site	BWC-MDST	BLISWORTH CLAY FORMATION - MUDSTONE	BATHONIAN
4	On site	CB-LMST	CORNBRASH FORMATION - LIMESTONE	BATHONIAN
5	On site	KLC-MDST	KELLAWAYS CLAY MEMBER - MUDSTONE	CALLOVIAN

ID	Location	LEX Code	Description	Rock age
6	**On site**	**KLS-SDSL**	**KELLAWAYS SAND MEMBER - SANDSTONE AND SILTSTONE, INTERBEDDED**	**CALLOVIAN**
7	**On site**	**BWL-LMST**	**BLISWORTH LIMESTONE FORMATION - LIMESTONE**	**BATHONIAN**
8	**On site**	**BWC-MDST**	**BLISWORTH CLAY FORMATION - MUDSTONE**	**BATHONIAN**
9	**On site**	**CB-LMST**	**CORNBRASH FORMATION - LIMESTONE**	**BATHONIAN**
10	**On site**	**OXC-MDST**	**OXFORD CLAY FORMATION - MUDSTONE**	**CALLOVIAN**
11	**On site**	**BWL-LMST**	**BLISWORTH LIMESTONE FORMATION - LIMESTONE**	**BATHONIAN**
12	43m NW	KLC-MDST	KELLAWAYS CLAY MEMBER - MUDSTONE	CALLOVIAN
13	181m E	BWC-MDST	BLISWORTH CLAY FORMATION - MUDSTONE	BATHONIAN
14	192m NW	KLC-MDST	KELLAWAYS CLAY MEMBER - MUDSTONE	CALLOVIAN
15	265m NW	CB-LMST	CORNBRASH FORMATION - LIMESTONE	BATHONIAN
16	310m NW	BWC-MDST	BLISWORTH CLAY FORMATION - MUDSTONE	BATHONIAN
17	336m E	RLD-MDST	RUTLAND FORMATION - MUDSTONE	BAJOCIAN
18	337m NE	CB-LMST	CORNBRASH FORMATION - LIMESTONE	BATHONIAN
19	394m NW	BWL-LMST	BLISWORTH LIMESTONE FORMATION - LIMESTONE	BATHONIAN
20	448m E	OXC-MDST	OXFORD CLAY FORMATION - MUDSTONE	CALLOVIAN
21	470m E	STAM-SDSL	STAMFORD MEMBER - SANDSTONE AND SILTSTONE, INTERBEDDED	BAJOCIAN
22	491m NW	RLD-MDST	RUTLAND FORMATION - MUDSTONE	BAJOCIAN

This data is sourced from the British Geological Survey.

15.9 Bedrock permeability (50k)

Records within 50m **7**

A qualitative classification of estimated rates of vertical movement of water from the ground surface through the unsaturated zone of bedrock (the zone between the land surface and the water table).

Location	Flow type	Maximum permeability	Minimum permeability
On site	**Mixed**	**Moderate**	**Moderate**
On site	**Fracture**	**Very High**	**High**
On site	**Fracture**	**Low**	**Very Low**

Location	Flow type	Maximum permeability	Minimum permeability
On site	**Fracture**	**Low**	**Very Low**
On site	**Fracture**	**Low**	**Very Low**
On site	**Fracture**	**Very High**	**Very High**
On site	**Fracture**	**Low**	**Very Low**

This data is sourced from the British Geological Survey.

15.10 Bedrock faults and other linear features (50k)

Records within 500m	**1**

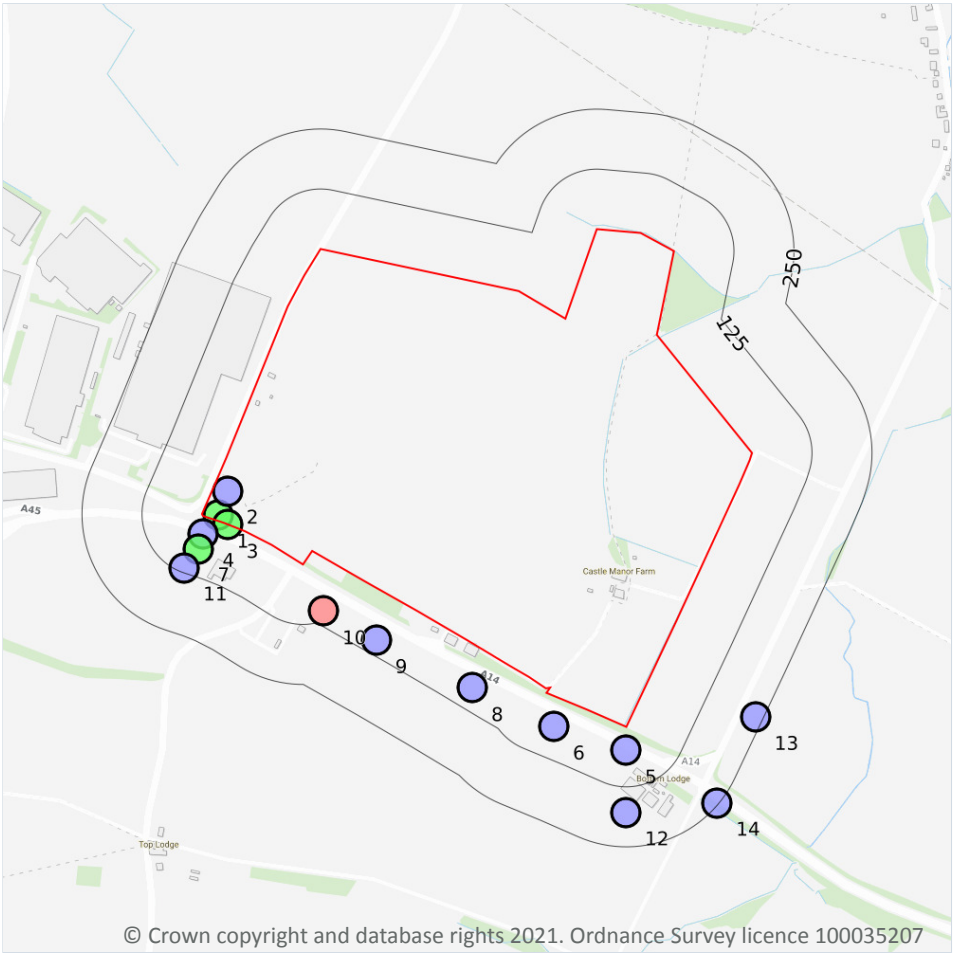
Linear features at the ground or bedrock surface at 1:50,000 scale of six main types; rock, fault, fold axis, mineral vein, alteration area or landform. Features are either observed or inferred, and relate primarily to bedrock.

Features are displayed on the Geology 1:50,000 scale - Bedrock map on **page 86**

ID	Location	Category	Description
2	**On site**	**FAULT**	**Fault, inferred**

This data is sourced from the British Geological Survey.

16 Boreholes



Site Outline

Search buffers in metres (m)

- Confidential
- 0 - 10m
- 10 - 30m
- 30m+
- Unknown

16.1 BGS Boreholes

Records within 250m	14

The Single Onshore Boreholes Index (SOBI); an index of over one million records of boreholes, shafts and wells from all forms of drilling and site investigation work held by the British Geological Survey. Covering onshore and nearshore boreholes dating back to at least 1790 and ranging from one to several thousand metres deep.

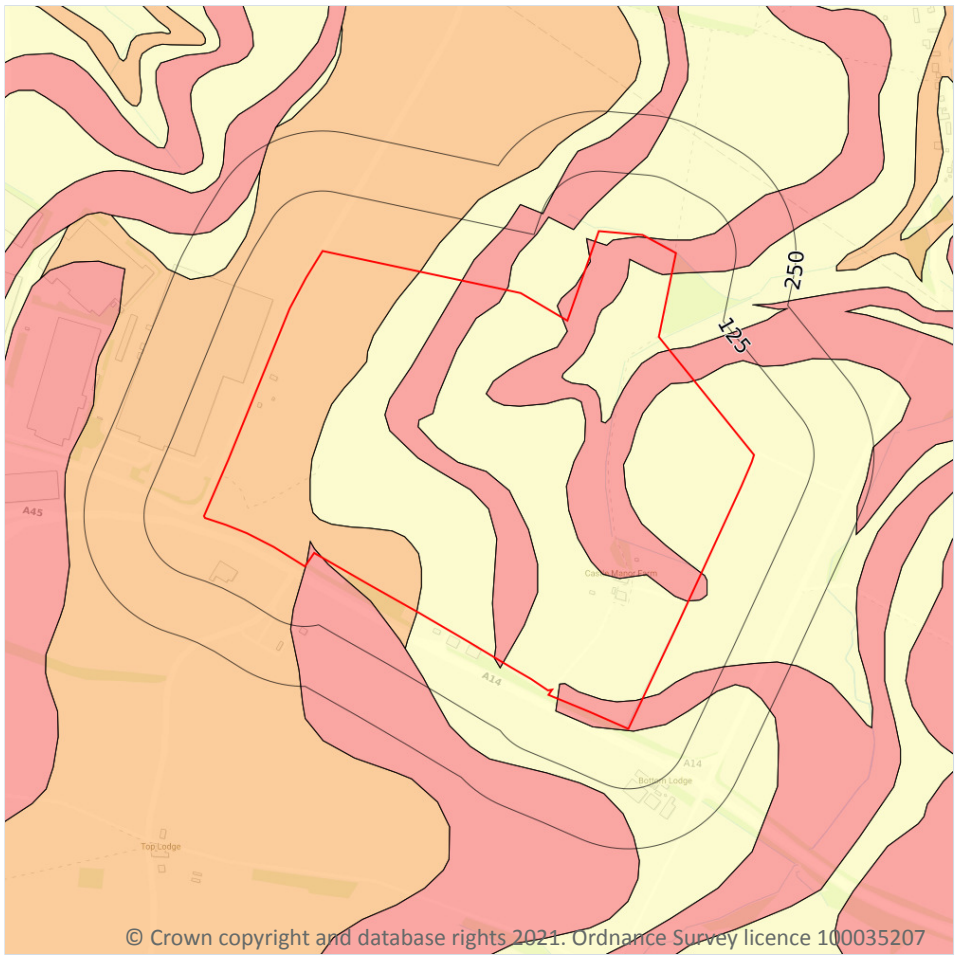
Features are displayed on the Boreholes map on **page 89**

ID	Location	Grid reference	Name	Length	Confidential	Web link
1	**On site**	**501250 278200**	**A14 THRAPSTON TO BRAMPTON GRADE SEPERATION 9853**	**13.2**	**N**	**525876**

ID	Location	Grid reference	Name	Length	Confidential	Web link
2	**On site**	**501270 278250**	**A14 THRAPSTON TO BRAMPTON GRADE SEPERATION TP9852**	**4.0**	**N**	**525875**
3	1m S	501270 278180	THRAPSTON	14.0	N	525842
4	36m S	501220 278160	A14 THRAPSTON TO BRAMPTON GRADE SEPERATION 9854	1.7	N	525877
5	49m S	502100 277710	A14 THRAPSTON TO BRAMPTON GRADE SEPERATION 9869	6.8	N	525880
6	58m S	501950 277760	A14 THRAPSTON TO BRAMPTON GRADE SEPERATION TP989	4.0	N	525858
7	68m S	501210 278130	A14 THRAPSTON TO BRAMPTON GRADE SEPERATION 9855	12.0	N	525878
8	80m SW	501780 277840	A14 THRAPSTON TO BRAMPTON GRADE SEPERATION TP9810	4.0	N	525859
9	94m SW	501580 277940	A14 THRAPSTON TO BRAMPTON GRADE SEPERATION TP9811	4.0	N	525860
10	97m SW	501470 278000	GAS COUNCIL GH14	241.74	N	525838
11	115m S	501180 278090	A14 THRAPSTON TO BRAMPTON GRADE SEPERATION TP9856	4.0	N	525879
12	179m S	502100 277580	A14 THRAPSTON TO BRAMPTON GRADE SEPERATION TP988	4.0	N	525857
13	234m SE	502370 277780	A14 THRAPSTON TO BRAMPTON GRADE SEPERATION TP981	4.0	N	525850
14	247m SE	502290 277600	M1 A1 KETTERING TO BRAMPTON TP1619	2.1	N	525908

This data is sourced from the British Geological Survey.

17 Natural ground subsidence - Shrink swell clays



Site Outline

Search buffers in metres (m)

- No data
- Negligible
- Very low
- Low
- Moderate
- High

17.1 Shrink swell clays

Records within 50m	3

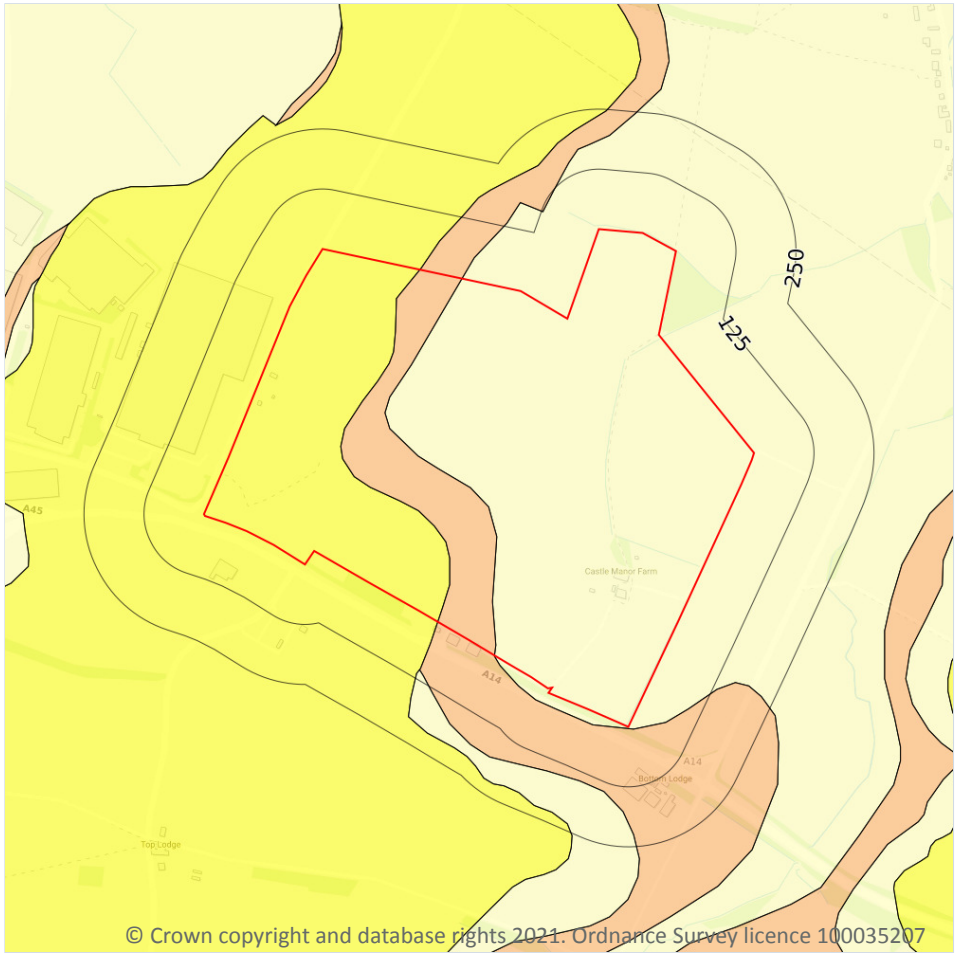
The potential hazard presented by soils that absorb water when wet (making them swell), and lose water as they dry (making them shrink). This shrink-swell behaviour is controlled by the type and amount of clay in the soil, and by seasonal changes in the soil moisture content (related to rainfall and local drainage).

Features are displayed on the Natural ground subsidence - Shrink swell clays map on **page 91**

Location	Hazard rating	Details
On site	**Negligible**	**Ground conditions predominantly non-plastic.**
On site	**Low**	**Ground conditions predominantly medium plasticity.**
On site	**Moderate**	**Ground conditions predominantly high plasticity.**

This data is sourced from the British Geological Survey.

Natural ground subsidence - Running sands



Site Outline

Search buffers in metres (m)

- No data
- Negligible
- Very low
- Low
- Moderate
- High

17.2 Running sands

Records within 50m	3

The potential hazard presented by rocks that can contain loosely-packed sandy layers that can become fluidised by water flowing through them. Such sands can 'run', removing support from overlying buildings and causing potential damage.

Features are displayed on the Natural ground subsidence - Running sands map on **page 93**

Location	Hazard rating	Details
On site	**Negligible**	**Running sand conditions are not thought to occur whatever the position of the water table. No identified constraints on lands use due to running conditions.**

Location	Hazard rating	Details
On site	**Very low**	**Running sand conditions are unlikely. No identified constraints on land use due to running conditions unless water table rises rapidly.**
On site	**Low**	**Running sand conditions may be present. Constraints may apply to land uses involving excavation or the addition or removal of water.**

This data is sourced from the British Geological Survey.

Natural ground subsidence - Compressible deposits

Site Outline

Search buffers in metres (m)

- No data
- Negligible
- Very low
- Low
- Moderate
- High

17.3 Compressible deposits

Records within 50m	1

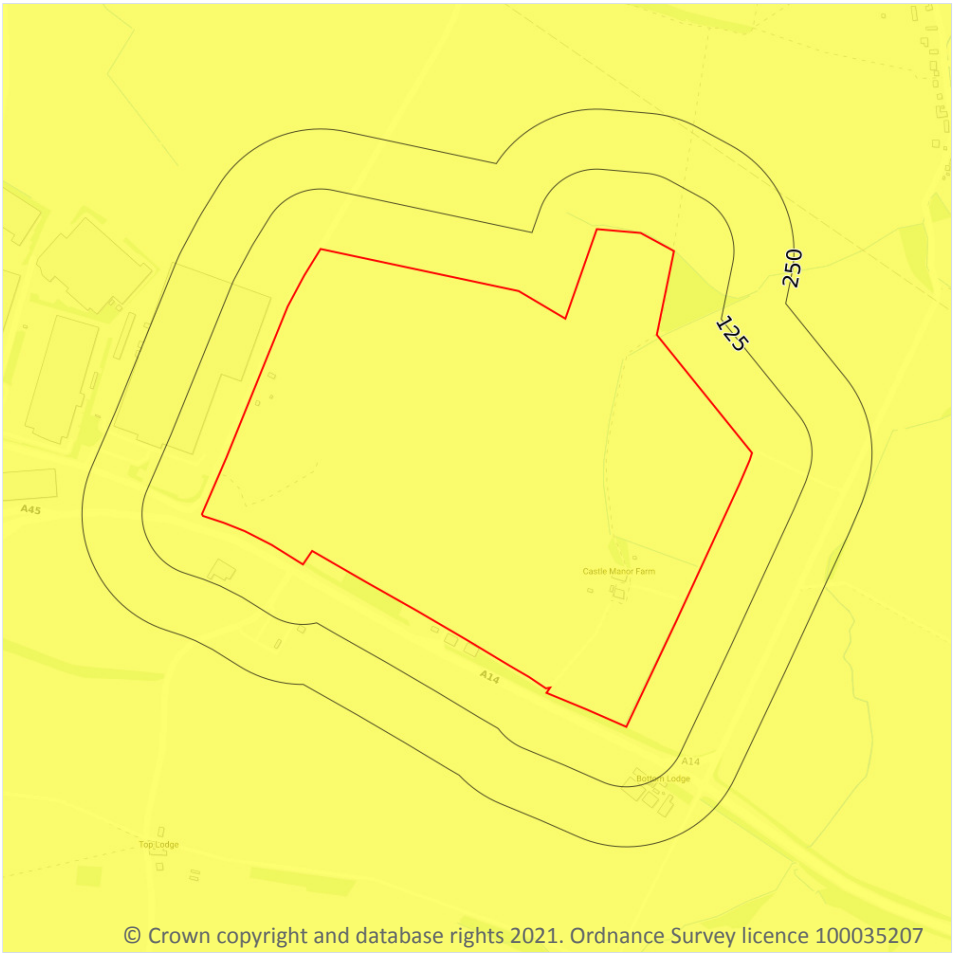
The potential hazard presented by types of ground that may contain layers of very soft materials like clay or peat and may compress if loaded by overlying structures, or if the groundwater level changes, potentially resulting in depression of the ground and disturbance of foundations.

Features are displayed on the Natural ground subsidence - Compressible deposits map on **page 95**

Location	Hazard rating	Details
On site	**Negligible**	**Compressible strata are not thought to occur.**

This data is sourced from the British Geological Survey.

Natural ground subsidence - Collapsible deposits



Site Outline

Search buffers in metres (m)

- No data
- Negligible
- Very low
- Low
- Moderate
- High

17.4 Collapsible deposits

Records within 50m	1

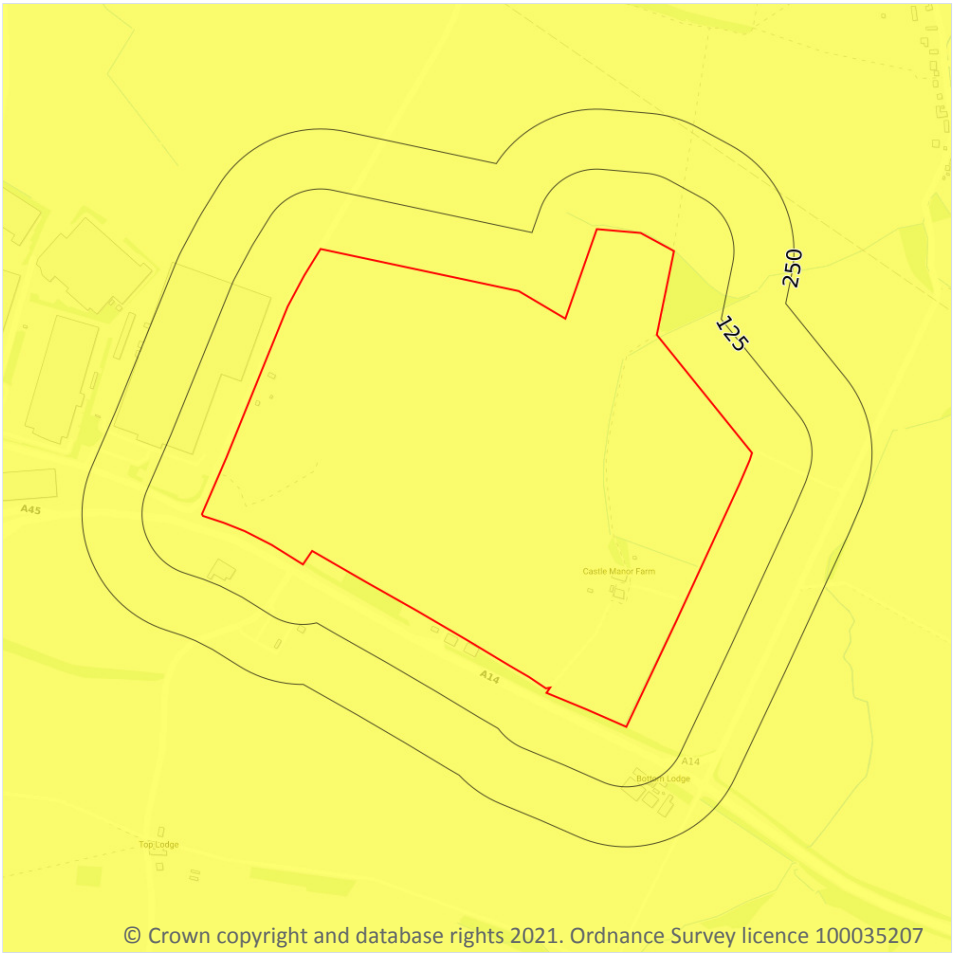
The potential hazard presented by natural deposits that could collapse when a load (such as a building) is placed on them or they become saturated with water.

Features are displayed on the Natural ground subsidence - Collapsible deposits map on **page 96**

Location	Hazard rating	Details
On site	**Very low**	**Deposits with potential to collapse when loaded and saturated are unlikely to be present.**

This data is sourced from the British Geological Survey.

Natural ground subsidence - Landslides



Site Outline

Search buffers in metres (m)

- No data
- Negligible
- Very low
- Low
- Moderate
- High

17.5 Landslides

Records within 50m	1

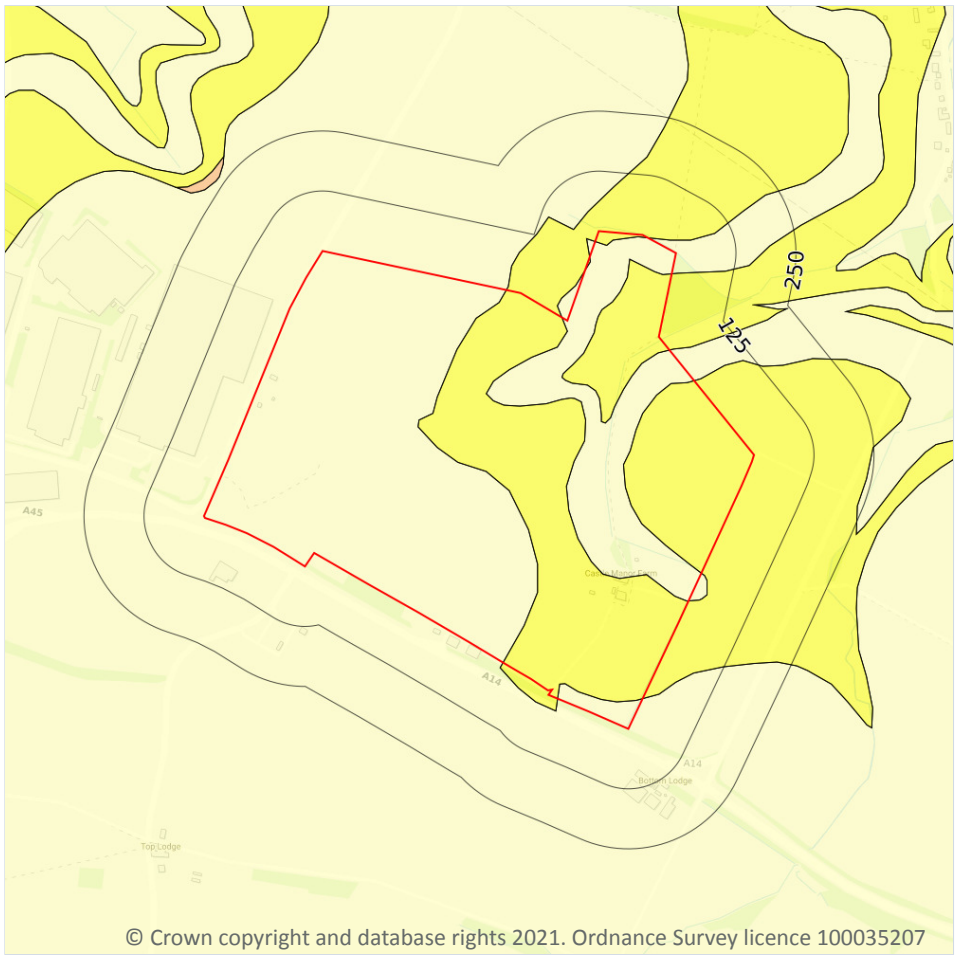
The potential for landsliding (slope instability) to be a hazard assessed using 1:50,000 scale digital maps of superficial and bedrock deposits, combined with information from the BGS National Landslide Database and scientific and engineering reports.

Features are displayed on the Natural ground subsidence - Landslides map on **page 97**

Location	Hazard rating	Details
On site	**Very low**	**Slope instability problems are not likely to occur but consideration to potential problems of adjacent areas impacting on the site should always be considered.**

This data is sourced from the British Geological Survey.

Natural ground subsidence - Ground dissolution of soluble rocks



Site Outline

Search buffers in metres (m)

- No data
- Negligible
- Very low
- Low
- Moderate
- High

17.6 Ground dissolution of soluble rocks

Records within 50m	2

The potential hazard presented by ground dissolution, which occurs when water passing through soluble rocks produces underground cavities and cave systems. These cavities reduce support to the ground above and can cause localised collapse of the overlying rocks and deposits.

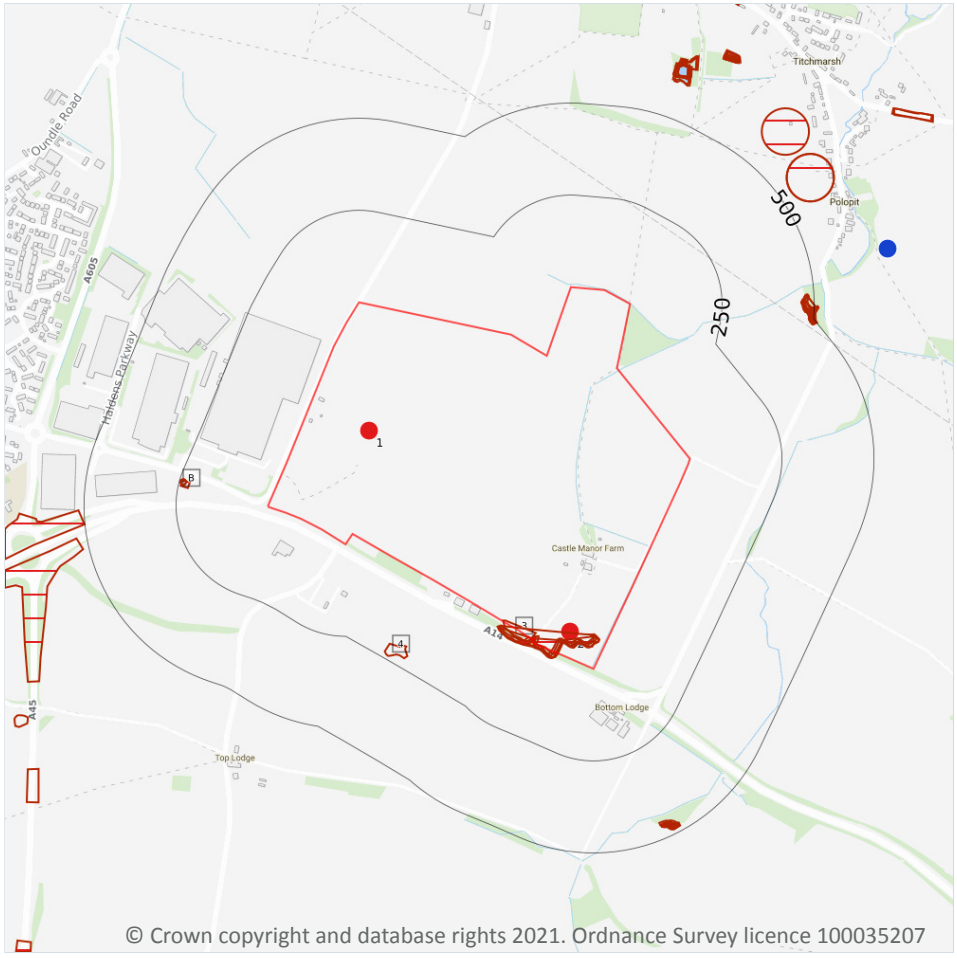
Features are displayed on the Natural ground subsidence - Ground dissolution of soluble rocks map on **page 98**

Location	Hazard rating	Details
On site	**Negligible**	**Soluble rocks are either not thought to be present within the ground, or not prone to dissolution. Dissolution features are unlikely to be present.**

Location	Hazard rating	Details
On site	**Very low**	**Soluble rocks are present within the ground. Few dissolution features are likely to be present. Potential for difficult ground conditions or localised subsidence are at a level where they need not be considered.**

This data is sourced from the British Geological Survey.

18 Mining, ground workings and natural cavities



Site Outline

Search buffers in metres (m)

- Natural cavities (Area)
- Natural cavities (Point)
- BritPits
- Surface ground workings
- Underground workings
- Historical Mineral Planning Areas
- Mining Cavities

Non Coal Mining

- Sporadic underground mining of restricted extent possible
- Localised small scale underground mining possible
- Small scale mining possible
- Underground mining known or likely within or in close proximity
- Underground mining known within or in very close proximity

18.1 Natural cavities

Records within 500m	0

Industry recognised national database of natural cavities. Sinkholes and caves are formed by the dissolution of soluble rock, such as chalk and limestone, gulls and fissures by cambering. Ground instability can result from movement of loose material contained within these cavities, often triggered by water.

This data is sourced from Stantec UK Ltd.

18.2 BritPits

Records within 500m	2

BritPits (an abbreviation of British Pits) is a database maintained by the British Geological Survey of currently active and closed surface and underground mineral workings. Details of major mineral handling sites, such as wharfs and rail depots are also held in the database.

Features are displayed on the Mining, ground workings and natural cavities map on **page 100**

ID	Location	Details	Description
1	**On site**	**Name: Castle Manor Farm Sand and Gravel Pit Address: Thrapston, KETTERING, Northamptonshire Commodity: Sand & Gravel Status: Ceased**	**Type: A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site Status description: Site which, at date of entry, has ceased to extract minerals. May be considered as Closed by operator. May be considered to have Active, Dormant or Expired planning permissions by Mineral Planning Authority**
2	**On site**	**Name: Rectory Farm Stone Pits Address: Thrapston, KETTERING, Northamptonshire Commodity: Limestone Status: Ceased**	**Type: A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site Status description: Site which, at date of entry, has ceased to extract minerals. May be considered as Closed by operator. May be considered to have Active, Dormant or Expired planning permissions by Mineral Planning Authority**

This data is sourced from the British Geological Survey.

18.3 Surface ground workings

Records within 250m	9

Historical land uses identified from Ordnance Survey mapping that involved ground excavation at the surface. These features may or may not have been subsequently backfilled.

Features are displayed on the Mining, ground workings and natural cavities map on **page 100**

ID	Location	Land Use	Year of mapping	Mapping scale
3	**On site**	**Unspecified Pit**	**1982**	**1:10000**
A	**On site**	**Old Stone Pits**	**1951**	**1:10560**
A	**On site**	**Old Stone Pits**	**1950**	**1:10560**
A	**On site**	**Old Stone Pits**	**1901**	**1:10560**
A	**On site**	**Unspecified Ground Workings**	**1885**	**1:10560**
4	193m SW	Disused Sewage Works	1950	1:10560

ID	Location	Land Use	Year of mapping	Mapping scale
B	222m W	Reservoir	1950	1:10560
B	232m W	Covered Reservoir	1994	1:10000
B	232m W	Covered Reservoir	1982	1:10000

This is data is sourced from Ordnance Survey/Groundsure.

18.4 Underground workings

Records within 1000m	**0**

Historical land uses identified from Ordnance Survey mapping that indicate the presence of underground workings e.g. mine shafts.

This is data is sourced from Ordnance Survey/Groundsure.

18.5 Historical Mineral Planning Areas

Records within 500m	**0**

Boundaries of mineral planning permissions for England and Wales. This data was collated between the 1940s (and retrospectively to the 1930s) and the mid 1980s. The data includes permitted, withdrawn and refused permissions.

This data is sourced from the British Geological Survey.

18.6 Non-coal mining

Records within 1000m	**0**

The potential for historical non-coal mining to have affected an area. The assessment is drawn from expert knowledge and literature in addition to the digital geological map of Britain. Mineral commodities may be divided into seven general categories - vein minerals, chalk, oil shale, building stone, bedded ores, evaporites and 'other' commodities (including ball clay, jet, black marble, graphite and chert).

This data is sourced from the British Geological Survey.

18.7 Mining cavities

Records within 1000m	**0**

Industry recognised national database of mining cavities. Degraded mines may result in hazardous subsidence (crown holes). Climatic conditions and water escape can also trigger subsidence over mine entrances and workings.

This data is sourced from Stantec UK Ltd.

18.8 JPB mining areas

Records on site	0

Areas which could be affected by former coal and other mining. This data includes some mine plans unavailable to the Coal Authority.

This data is sourced from Johnson Poole and Bloomer.

18.9 Coal mining

Records on site	0

Areas which could be affected by past, current or future coal mining.

This data is sourced from the Coal Authority.

18.10 Brine areas

Records on site	0

The Cheshire Brine Compensation District indicates areas that may be affected by salt and brine extraction in Cheshire and where compensation would be available where damage from this mining has occurred. Damage from salt and brine mining can still occur outside this district, but no compensation will be available.

This data is sourced from the Cheshire Brine Subsidence Compensation Board.

18.11 Gypsum areas

Records on site	0

Generalised areas that may be affected by gypsum extraction.

This data is sourced from British Gypsum.

18.12 Tin mining

Records on site	0

Generalised areas that may be affected by historical tin mining.

This data is sourced from Mining Searches UK.

18.13 Clay mining

Records on site	0

Generalised areas that may be affected by kaolin and ball clay extraction.

This data is sourced from the Kaolin and Ball Clay Association (UK).

19 Radon

Site Outline

Search buffers in metres (m)

- Greater than 30%
- Between 10% and 30%
- Between 5% and 10%
- Between 3% and 5%
- Between 1% and 3%
- Less than 1%

19.1 Radon

Records on site	1

Estimated percentage of dwellings exceeding the Radon Action Level. This data is the highest resolution radon dataset available for the UK and is produced to a 75m level of accuracy to allow for geological data accuracy and a 'residential property' buffer. The findings of this section should supersede any estimations derived from the Indicative Atlas of Radon in Great Britain. The data was derived from both geological assessments and long term measurements of radon in more than 479,000 households.

Features are displayed on the Radon map on **page 105**

Location	Estimated properties affected	Radon Protection Measures required
On site	**Less than 1%**	**None****

This data is sourced from the British Geological Survey and Public Health England.

20 Soil chemistry

20.1 BGS Estimated Background Soil Chemistry

Records within 50m **60**

The estimated values provide the likely background concentration of the potentially harmful elements Arsenic, Cadmium, Chromium, Lead and Nickel in topsoil. The values are estimated primarily from rural topsoil data collected at a sample density of approximately 1 per 2 km^2. In areas where rural soil samples are not available, estimation is based on stream sediment data collected from small streams at a sampling density of 1 per 2.5 km^2; this is the case for most of Scotland, Wales and southern England. The stream sediment data are converted to soil-equivalent concentrations prior to the estimation.

Location	Arsenic	Bioaccessible Arsenic	Lead	Bioaccessible Lead	Cadmium	Chromium	Nickel
On site	**15 - 25 mg/kg**	**No data**	**100 mg/kg**	**60 mg/kg**	**1.8 mg/kg**	**60 - 90 mg/kg**	**30 - 45 mg/kg**
On site	**15 - 25 mg/kg**	**No data**	**100 mg/kg**	**60 mg/kg**	**1.8 mg/kg**	**60 - 90 mg/kg**	**15 - 30 mg/kg**
On site	**15 - 25 mg/kg**	**No data**	**100 mg/kg**	**60 mg/kg**	**1.8 mg/kg**	**60 - 90 mg/kg**	**30 - 45 mg/kg**
On site	**15 - 25 mg/kg**	**No data**	**100 mg/kg**	**60 mg/kg**	**1.8 mg/kg**	**60 - 90 mg/kg**	**15 - 30 mg/kg**
On site	**15 - 25 mg/kg**	**No data**	**100 mg/kg**	**60 mg/kg**	**1.8 mg/kg**	**60 - 90 mg/kg**	**30 - 45 mg/kg**
On site	**15 - 25 mg/kg**	**No data**	**100 mg/kg**	**60 mg/kg**	**1.8 mg/kg**	**60 - 90 mg/kg**	**30 - 45 mg/kg**
On site	**15 - 25 mg/kg**	**No data**	**100 mg/kg**	**60 mg/kg**	**1.8 mg/kg**	**60 - 90 mg/kg**	**30 - 45 mg/kg**
On site	**15 - 25 mg/kg**	**No data**	**100 mg/kg**	**60 mg/kg**	**1.8 mg/kg**	**60 - 90 mg/kg**	**30 - 45 mg/kg**
On site	**15 - 25 mg/kg**	**No data**	**100 mg/kg**	**60 mg/kg**	**1.8 mg/kg**	**60 - 90 mg/kg**	**15 - 30 mg/kg**
On site	**15 - 25 mg/kg**	**No data**	**100 mg/kg**	**60 mg/kg**	**1.8 mg/kg**	**60 - 90 mg/kg**	**30 - 45 mg/kg**
On site	**15 - 25 mg/kg**	**No data**	**100 mg/kg**	**60 mg/kg**	**1.8 mg/kg**	**60 - 90 mg/kg**	**30 - 45 mg/kg**
On site	**15 - 25 mg/kg**	**No data**	**100 mg/kg**	**60 mg/kg**	**1.8 mg/kg**	**60 - 90 mg/kg**	**30 - 45 mg/kg**

Location	Arsenic	Bioaccessible Arsenic	Lead	Bioaccessible Lead	Cadmium	Chromium	Nickel
On site	15 - 25 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	30 - 45 mg/kg
On site	15 - 25 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	30 - 45 mg/kg
On site	15 - 25 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	30 - 45 mg/kg
On site	15 - 25 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	30 - 45 mg/kg
On site	15 - 25 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	30 - 45 mg/kg
On site	15 - 25 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg
On site	15 - 25 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	30 - 45 mg/kg
On site	15 - 25 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	30 - 45 mg/kg
On site	15 - 25 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	30 - 45 mg/kg
On site	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	30 - 45 mg/kg
On site	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	30 - 45 mg/kg
On site	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg
On site	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	30 - 45 mg/kg
On site	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	30 - 45 mg/kg
On site	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	30 - 45 mg/kg
On site	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	30 - 45 mg/kg
On site	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	30 - 45 mg/kg
On site	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	30 - 45 mg/kg

Location	Arsenic	Bioaccessible Arsenic	Lead	Bioaccessible Lead	Cadmium	Chromium	Nickel
On site	**15 mg/kg**	**No data**	**100 mg/kg**	**60 mg/kg**	**1.8 mg/kg**	**60 - 90 mg/kg**	**30 - 45 mg/kg**
On site	**15 mg/kg**	**No data**	**100 mg/kg**	**60 mg/kg**	**1.8 mg/kg**	**60 - 90 mg/kg**	**30 - 45 mg/kg**
On site	**15 mg/kg**	**No data**	**100 mg/kg**	**60 mg/kg**	**1.8 mg/kg**	**60 - 90 mg/kg**	**30 - 45 mg/kg**
On site	**15 mg/kg**	**No data**	**100 mg/kg**	**60 mg/kg**	**1.8 mg/kg**	**60 - 90 mg/kg**	**15 - 30 mg/kg**
On site	**15 mg/kg**	**No data**	**100 mg/kg**	**60 mg/kg**	**1.8 mg/kg**	**60 - 90 mg/kg**	**15 - 30 mg/kg**
On site	**15 mg/kg**	**No data**	**100 mg/kg**	**60 mg/kg**	**1.8 mg/kg**	**60 - 90 mg/kg**	**15 - 30 mg/kg**
On site	**15 mg/kg**	**No data**	**100 mg/kg**	**60 mg/kg**	**1.8 mg/kg**	**60 - 90 mg/kg**	**30 - 45 mg/kg**
On site	**15 mg/kg**	**No data**	**100 mg/kg**	**60 mg/kg**	**1.8 mg/kg**	**60 - 90 mg/kg**	**30 - 45 mg/kg**
On site	**15 mg/kg**	**No data**	**100 mg/kg**	**60 mg/kg**	**1.8 mg/kg**	**60 - 90 mg/kg**	**30 - 45 mg/kg**
On site	**15 mg/kg**	**No data**	**100 mg/kg**	**60 mg/kg**	**1.8 mg/kg**	**60 - 90 mg/kg**	**15 - 30 mg/kg**
On site	**15 mg/kg**	**No data**	**100 mg/kg**	**60 mg/kg**	**1.8 mg/kg**	**60 - 90 mg/kg**	**15 - 30 mg/kg**
On site	**15 mg/kg**	**No data**	**100 mg/kg**	**60 mg/kg**	**1.8 mg/kg**	**60 - 90 mg/kg**	**15 - 30 mg/kg**
On site	**15 mg/kg**	**No data**	**100 mg/kg**	**60 mg/kg**	**1.8 mg/kg**	**60 - 90 mg/kg**	**15 - 30 mg/kg**
On site	**15 mg/kg**	**No data**	**100 mg/kg**	**60 mg/kg**	**1.8 mg/kg**	**60 - 90 mg/kg**	**30 - 45 mg/kg**
On site	**15 mg/kg**	**No data**	**100 mg/kg**	**60 mg/kg**	**1.8 mg/kg**	**60 - 90 mg/kg**	**30 - 45 mg/kg**
On site	**15 mg/kg**	**No data**	**100 mg/kg**	**60 mg/kg**	**1.8 mg/kg**	**60 - 90 mg/kg**	**30 - 45 mg/kg**
On site	**15 mg/kg**	**No data**	**100 mg/kg**	**60 mg/kg**	**1.8 mg/kg**	**60 - 90 mg/kg**	**15 - 30 mg/kg**
3m SW	15 - 25 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	30 - 45 mg/kg

Location	Arsenic	Bioaccessible Arsenic	Lead	Bioaccessible Lead	Cadmium	Chromium	Nickel
4m N	15 - 25 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	30 - 45 mg/kg
4m SE	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg
12m SW	15 - 25 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	30 - 45 mg/kg
26m S	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg
35m N	15 - 25 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	30 - 45 mg/kg
35m N	15 - 25 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	30 - 45 mg/kg
37m E	15 - 25 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	30 - 45 mg/kg
38m W	15 - 25 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	30 - 45 mg/kg
41m S	15 - 25 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	30 - 45 mg/kg
43m N	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg
44m N	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg
44m N	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg

This data is sourced from the British Geological Survey.

20.2 BGS Estimated Urban Soil Chemistry

Records within 50m	**0**

Estimated topsoil chemistry of Arsenic, Cadmium, Chromium, Copper, Nickel, Lead, Tin and Zinc and bioaccessible Arsenic and Lead in 23 urban centres across Great Britain. These estimates are derived from interpolation of the measured urban topsoil data referred to above and provide information across each city between the measured sample locations (4 per km^2).

This data is sourced from the British Geological Survey.

20.3 BGS Measured Urban Soil Chemistry

Records within 50m	0

The locations and measured total concentrations (mg/kg) of Arsenic, Cadmium, Chromium, Copper, Nickel, Lead, Tin and Zinc in urban topsoil samples from 23 urban centres across Great Britain. These are collected at a sample density of 4 per km^2.

This data is sourced from the British Geological Survey.

21 Railway infrastructure and projects

21.1 Underground railways (London)

Records within 250m	0

Details of all active London Underground lines, including approximate tunnel roof depth and operational hours.

This data is sourced from publicly available information by Groundsure.

21.2 Underground railways (Non-London)

Records within 250m	0

Details of the Merseyrail system, the Tyne and Wear Metro and the Glasgow Subway. Not all parts of all systems are located underground. The data contains location information only and does not include a depth assessment.

This data is sourced from publicly available information by Groundsure.

21.3 Railway tunnels

Records within 250m	0

Railway tunnels taken from contemporary Ordnance Survey mapping.

This data is sourced from the Ordnance Survey.

21.4 Historical railway and tunnel features

Records within 250m	0

Railways and tunnels digitised from historical Ordnance Survey mapping as scales of 1:1,250, 1:2,500, 1:10,000 and 1:10,560.

This data is sourced from Ordnance Survey/Groundsure.

21.5 Royal Mail tunnels

Records within 250m	0

The Post Office Railway, otherwise known as the Mail Rail, is an underground railway running through Central London from Paddington Head District Sorting Office to Whitechapel Eastern Head Sorting Office. The line is 10.5km long. The data includes details of the full extent of the tunnels, the depth of the tunnel, and the depth to track level.

This data is sourced from Groundsure/the Postal Museum.

21.6 Historical railways

Records within 250m	0

Former railway lines, including dismantled lines, abandoned lines, disused lines, historic railways and razed lines.

This data is sourced from OpenStreetMap.

21.7 Railways

Records within 250m	0

Currently existing railway lines, including standard railways, narrow gauge, funicular, trams and light railways.

This data is sourced from Ordnance Survey and OpenStreetMap.

21.8 Crossrail 1

Records within 500m	0

The Crossrail railway project links 41 stations over 100 kilometres from Reading and Heathrow in the west, through underground sections in central London, to Shenfield and Abbey Wood in the east.

This data is sourced from publicly available information by Groundsure.

21.9 Crossrail 2

Records within 500m	0

Crossrail 2 is a proposed railway linking the national rail networks in Surrey and Hertfordshire via an underground tunnel through London.

This data is sourced from publicly available information by Groundsure.

21.10 HS2

Records within 500m	0

HS2 is a proposed high speed rail network running from London to Manchester and Leeds via Birmingham. Main civils construction on Phase 1 (London to Birmingham) of the project began in 2019, and it is currently anticipated that this phase will be fully operational by 2026. Construction on Phase 2a (Birmingham to Crewe) is anticipated to commence in 2021, with the service fully operational by 2027. Construction on Phase 2b (Crewe to Manchester and Birmingham to Leeds) is scheduled to begin in 2023 and be operational by 2033.

This data is sourced from HS2 ltd.

Data providers

Groundsure works with respected data providers to bring you the most relevant and accurate information. To find out who they are and their areas of expertise see https://www.groundsure.com/sources-reference.

Terms and conditions

Groundsure's Terms and Conditions can be accessed at this link: https://www.groundsure.com/terms-and-conditions-jan-2020/.

BGS Archive Records

British Geological Survey

Version 2.0.6.3

BGS ID: 525876 : BGS Reference: TL07NW73
British National Grid (27700) : 501250,278200

Report an issue with this borehole

Boring method: Cable Percussion	Boring diameter (mm): 150 to 13.20m		Record of BOREHOLE 98/53
Boring equipment: Pilcon 1500	Casing diameter (mm): 150 to 13.20m		(Sheet 1 of 2)
Location: E 501255.6 N 278201.0	Orientation: Vertical	Ground level mAOD: 67.16	Date commenced: 11/03/99

TL07NW 73

Samples and in situ tests Depth (m)	Type	Casing depth (m)	Backfill Depth (m)	Symbol	Water depth (m)	TCR SCR (RQD)	If	Depth (m)	Description of Strata	AOD Level mAOD	Legend
								0.30	TOPSOIL	66.86	
									Soft to firm brown mottled orangish brown and greyish brown slightly gravelly sandy CLAY (GLACIAL TILL)		
1.00	B										
1.50	U B	48	1.50						Stiff at 1.50m		
2.50	S D B	25	1.50		DRY						
								3.30		63.86	
3.50	U B	80	1.50						Very stiff dark grey slightly sandy slightly gravelly CLAY (GLACIAL TILL)		
4.50	S D B	33	1.50		DRY						
5.50	U B	58	1.50								
6.50	S D B	24	1.50		DRY						
								7.40		59.76	
7.50	U	65	1.50						Very stiff fissured grey slightly sandy slightly gravelly CLAY (GLACIAL TILL)		
					▽			8.60		58.56	
9.00	S D B	13	9.00		▽				Medium dense reddish brown medium and coarse SAND and fine and medium GRAVEL (FLUVIO-GLACIAL SAND AND GRAVEL)		

REMARKS:
1. Hand excavated inspection pit dug to 1.20m before drilling commenced. No services recorded
2. Borehole abandoned at 13.20m due to presence of very dense limestone

Drilling Progress Date	Depth(m)
11/03/99	13.20

Ground-water Struck(m)	Rose To(m)	Time(min)	Cut Off(m)
9.00	8.60	5	

Water Added From(m)	To(m)

Chiselling From(m)	To(m)	Time(hr)

Flush Depth(m)	Type	Returns

Driller	Originator	BOREHOLE RECORD Scale 1:50
KT	SDC	For explanation of symbols and abbreviations see Key Sheet
Checked & Approved	Log Status: FINAL	A14 THRAPSTON TO BRAMPTON GRADE SEPARATION MAIN GROUND INVESTIGATION

WIMTEC ENVIRONMENTAL

Fig A61

Lab Ref No: SI32373 Template: STANDARD.GDT Style: BOREHOLE1 File: H:\EPG\15513\MDATA\32373.GPJ Printed: 14/10/99 15:03:42 Wimtec Environmental Limited, Loanings park House, Uphall, West Lothian, EH52 5NW

British Geological Survey

Version 2.0.6.3

BGS ID: 525876 : BGS Reference: TL07NW73
British National Grid (27700) : 501250,278200

Report an issue with this borehole

Boring method: Cable Percussion			Boring diameter (mm): 150 to 13.20m	Record of BOREHOLE 98/53
Boring equipment: Pilcon 1500			Casing diameter (mm): 150 to 13.20m	
Location: E 501255.6 N 278201.0	Orientation: Vertical		Ground level mAOD: 67.16	Date commenced: 11/03/99 (Sheet 2 of 2)

TL07NW 73

Samples and in situ tests: Depth (m)	Type	Casing depth (m)	Backfill Depth (m)	Symbol	Water depth (m)	TCR SCR (RQD)	If	Depth (m)	Description of Strata	AOD Level mAOD	Legend
									See previous sheet		
10.50	S D	19 10.50									
12.00	S D B	24 12.00									
								12.80		54.36	
								13.00	Stiff grey streaked brown gravelly sandy CLAY (OXFORD CLAY)	54.16	
13.00	S D	>50 13.00 13.20	13.20					13.20	Reddish brown LIMESTONE, strong (OXFORD CLAY)	53.96	
13.20	S	>50 13.20							END OF BOREHOLE		

REMARKS:

Drilling Progress: Date	Depth(m)
11/03/99	13.20

Ground-water: Struck(m)	Rose To(m)	Time(min)	Cut Off(m)

Water Added: From(m)	To(m)

Chiselling: From(m)	To(m)	Time(hr)
13.00	13.20	1:00

Flush: Depth(m)	Type	Returns

Driller	Originator
KT	SDC
Checked & Approved	Log Status
	FINAL

BOREHOLE RECORD
Scale 1:50
For explanation of symbols and abbreviations see Key Sheet

A14 THRAPSTON TO BRAMPTON GRADE SEPARATION
MAIN GROUND INVESTIGATION

WIMTEC ENVIRONMENTAL

Fig A61 Cont'd

Lab Ref No S/32373 Template: STANDARD.GDT Style: BOREHOLE1 File: H:\EPG\15513\MDATA\32373.GPJ Printed: 14/10/99 15:03:52 Wimtec Environmental Limited, Loaningpark House, Uphall, West Lothian, EH52 5NW

Specialist UXO Desk Top Study

EOD Contracts Ltd

International Unexploded Ordnance Risk Mitigation

Many People... ...One Aim

EXPLOSIVE ORDNANCE DESK TOP STUDY FOR:

HUNTINGDON ROAD, THRAPSTON, NORTHAMPTONSHIRE

PROJECT 21249

HYDROCK

Institute of Explosives Engineers
VOICE OF THE EXPLOSIVES INDUSTRIES

www.eodcontractsltd.com Tel 01386 578 405

EXPLOSIVE ORDNANCE DESK TOP STUDY

Of

Huntingdon Road Thrapston, Northamptonshire

Conducted by EOD Contracts Limited

On behalf of

Hydrock

Conditions of Release

Document Control & Enquiries

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Telephone: 01386 578405.
Alternatively; the persons named above can be reached at the above address.

CONTENTS

TERMS AND DEFINITIONS

Anti Aircraft Shells (AA)

Small High Explosive Shells (HE) shells ranging up to 100mm in diameter.

Air Raid Precautions (ARP)

An organisation in the United Kingdom set up in 1937 dedicated to the protection of civilians from the danger of air raids. It included the Raid Wardens' Service that was to report on bombing incidents.

Battlefield Area Clearance (BAC)

The systematic clearance of munitions from military property or old battle sites e.g. ranges, airfields etc.

Borehole Search

The placing of boreholes in a set pattern, then using a magnetometer to take readings at specific depths along each borehole. When used with a geophysical survey system this will give a magnetic signature of the area. The depth of the borehole and the pattern will depend upon the type of Unexploded Bombs (UXB) and the geology of the ground.

Doodle Bug (See Pilotless Aircraft)

Explosive Ordnance (EO)

All munitions containing explosives, nuclear fission/fusion materials and or biological and chemical agents. This includes bombs and warheads; guided and ballistic missiles; artillery, mortar, rocket and Small Arms Ammunition (SAA); all mines, torpedoes and depth charges; pyrotechnics; clusters and dispensers; cartridge and propellant actuated devices; electro-explosive devices; clandestine and improvised explosive devices (IED); and all similar or related items or components explosive in nature.

Explosive Ordnance Clearance (EOC)

See BAC.

Explosive Ordnance Disposal (EOD)

The detection, identification, field evaluation, render safe, recovery and disposal of **UXO**.

Geophysical Survey

The survey of an area using a Magnetometer and geophysical gathering device, after interpretation, this will produce a geophysical map and an object list for any metallic anomalies.

High Explosive (HE)

High explosives burn/detonate at rates of up to 9,000 m/per second.

Incendiary Bomb (IB)

Incendiary bombs ranged from 1kg in size to 500kg the larger sizes were sometimes called Oil Bombs. Fills range from thermite mixtures, phosphorus to kerosene.

Intrusive Survey

The use of a cone penetrometer (MagCone) or drilled boreholes (MagDrill) to take magnetometer test in a set pattern (see borehole search), or to prove pile positions.

Land Service Ammunition (LSA)

LSA is defined as “All items containing explosives or pyrotechnic compounds which are placed, thrown or projected so as to cause damage to men and equipment during land warfare.

Long Range Rocket (LRR)

The long range rocket sometimes codenamed Big Ben is the V2 rocket designed to deliver an approximate payload of 1000 kg.

Oil Bomb (OB)

A bomb containing a flammable liquid, normally the KC 250 Flam or the C 500 flam.

Pilot less Aircraft (PAC)

A flying bomb (Fly) or doodlebug is the V1 rocket or predecessors designed to deliver an explosive payload of approximately 500kg - 800kg.

Parachute Mine (PM)

Air dropped mine may have been used as a blast effect bomb maximum explosive content 1600lb always fitted with anti-handling and anti-stripping equipment.

Unexploded Bomb (UXB)

Any air dropped bomb that has failed to operate.

Unexploded Ordnance (UXO)

Explosive ordnance that has been primed, fused, armed or otherwise prepared for use or used. It may have been fired, dropped, launched or projected yet remains unexploded either through malfunction or design or for any other cause.

Vengeance Weapons (V)

V1 see Pilot less Aircraft.
V2 see Long Range Rocket.

WWI

World War 1 (1914 – 1918)

WWII

World War 2 (1939 – 1945)

EXECUTIVE SUMMARY

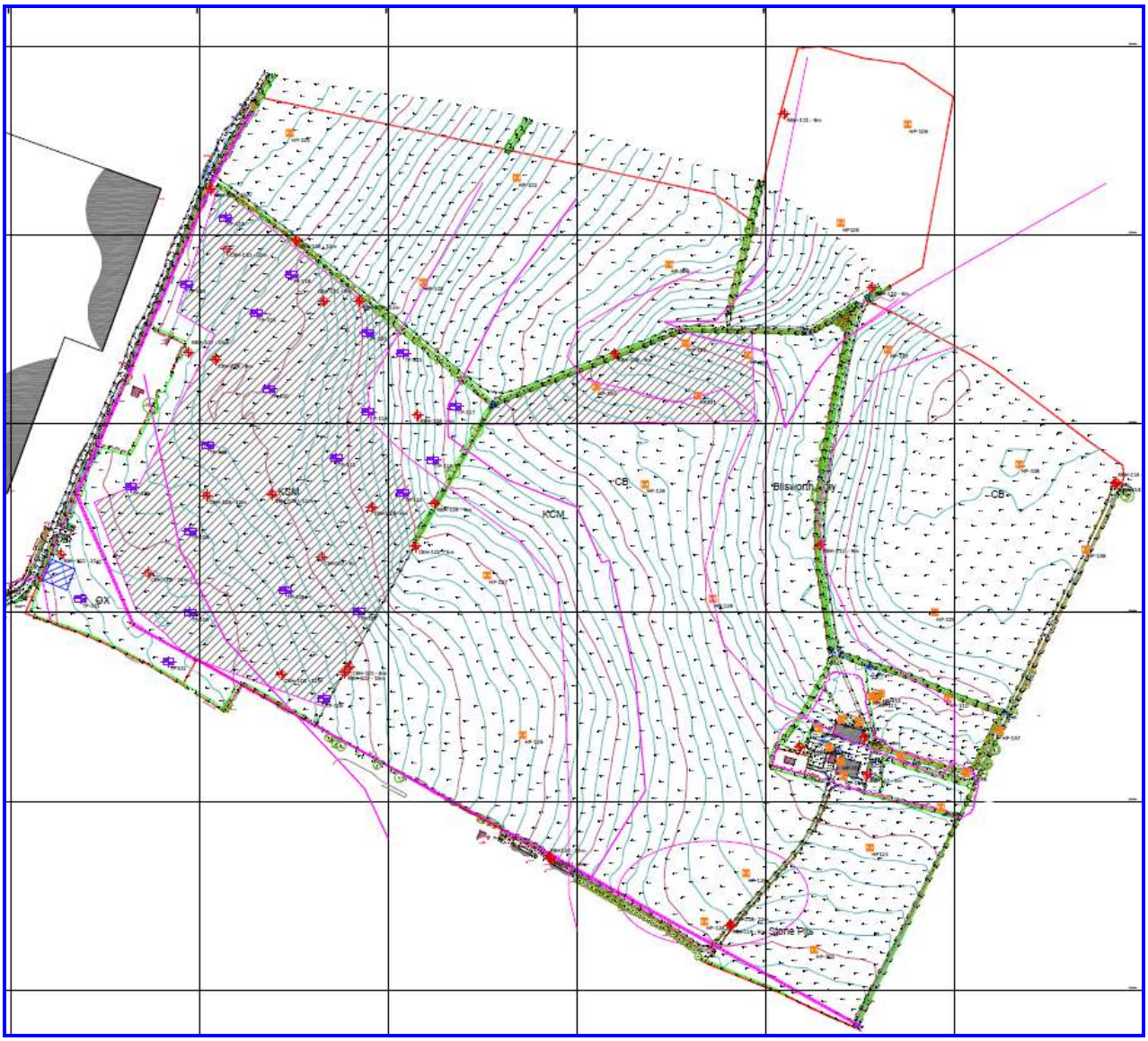
INSTRUCTION

EOD Contracts Ltd, have been commissioned by Hydrock to undertake a desktop study for potential historic Unexploded Ordnance (UXO) contamination for the future works at Huntingdon Road, Thrapston, Northamptonshire (The Site).

Scope of Work

The scope of this EO Risk Assessment/Desk Study is to assess the likelihood of buried EO/UXO within the environs of The Site (See Figure 1), in view of further development. A further aim was to evaluate the implication from UXO contamination during any future intrusive land use.

Figure 1**:** Clients Supplied Site Diagram, This DTS will be covering all areas highlighted.



LOCATION

The site is located east of Thrapston an industrial town in North Northamptonshire, England. During WWII the site was within the Air Raid Precautions reporting area Region (3) North Midlands HQ Nottingham (Mansfield)**.**

Table 1 Site Location

Title	Description (Centre of Site)
Address	Huntingdon Road Thrapston, Northamptonshire
Post Code	NN14 4NJ
Grid Reference	TL0161578249
OS (X)	501615
OS (Y)	278249

SOURCES OF UXO CONTAMINATION

The main sources of UXO contamination that have been researched and are deemed a threat to the site are:

- Air delivered ordnance bombs and sub-munitions/incendiaries
- Anti Aircraft Ammunition (AA)
- Explosive or Munition Factories
- Military Usage

KEY FINDINGS

Based on the information researched by EOD Contracts Ltd for the proposed scope of works being carried out within the given site area, the following conclusions have been reached:

Historical UXO Contamination

The indicators for UXO contamination are:

Bomb Strikes	No recorded bomb strike in the vicinity of the site
Bomb Damage	No bomb damage was noted
Reconstruction	No reconstruction was noted
Military Usage	A Light AA Battery was on site; however, the usage is assumed to be low with a probable weapon system that utilise Small Arms Ammunition (bullets). A military camp was to the south of the site, this was not an ammunition storage facility
Explosive/ Munition Factory	The site was not used in the production of explosives or munitions

Risk Level

The overall risk has been determined to apply to all ground works within the site footprint.

Risk Level	Therefore, so far as reasonably practicable the risk level on site is deemed as **LOW**.
Risk Depth	The expected bomb depth is not applicable.

RECOMMENDATIONS

It is recommended that, due to the site having an LAA Battery and a nearby military establishment it would be deemed prudent for all personnel carrying out intrusive works to have:

Safety Training; UXO safety awareness training should be given at all levels of site personnel and selected individuals on the project staff with relevant responsibilities. The training should be provided by a competent person as part of the project safety induction course. It should be reinforced with specific safety briefings and tool box talks to individuals involved in conducting intrusive earthworks. The training should cover the following topics to a level commensurate with the audience's responsibilities and duties:

- Project overview and the responsibilities of those working on site with regard to duty of care and public safety
- UXO recognition and safety procedures to be followed on discovery of a suspicious object or the alarm being sounded

No further UXO risk mitigation strategies are required.

EOD Contracts Ltd can supply a turnkey solution to your UXO requirements. Therefore, the following mitigation strategies can be supplied for land or water based operations:

Intrusive survey using CPT *(Cone Pressure Testing)* or borehole equipment, *supplying risk mitigation to all Borehole and Pile locations, down to a maximum bomb penetration depth determined within this document.*

Non-Intrusive Survey using multiple array system with DGPS *(Differential Global Positioning System).*

Offshore, near-shore, estuarine and freshwater water environments magnetic, side scan and bathymetric supported by state of the art DGPS.

The aforementioned surveys are supported with post processing of data and intrusive investigations if required.

EOD Engineer over watch using Suitably Qualified and Experienced Personnel, normally former British Army, Navy or RAF Bomb Disposal specialists.

Explosive Ordnance Safety Presentations.

PART 1: INTRODUCTION

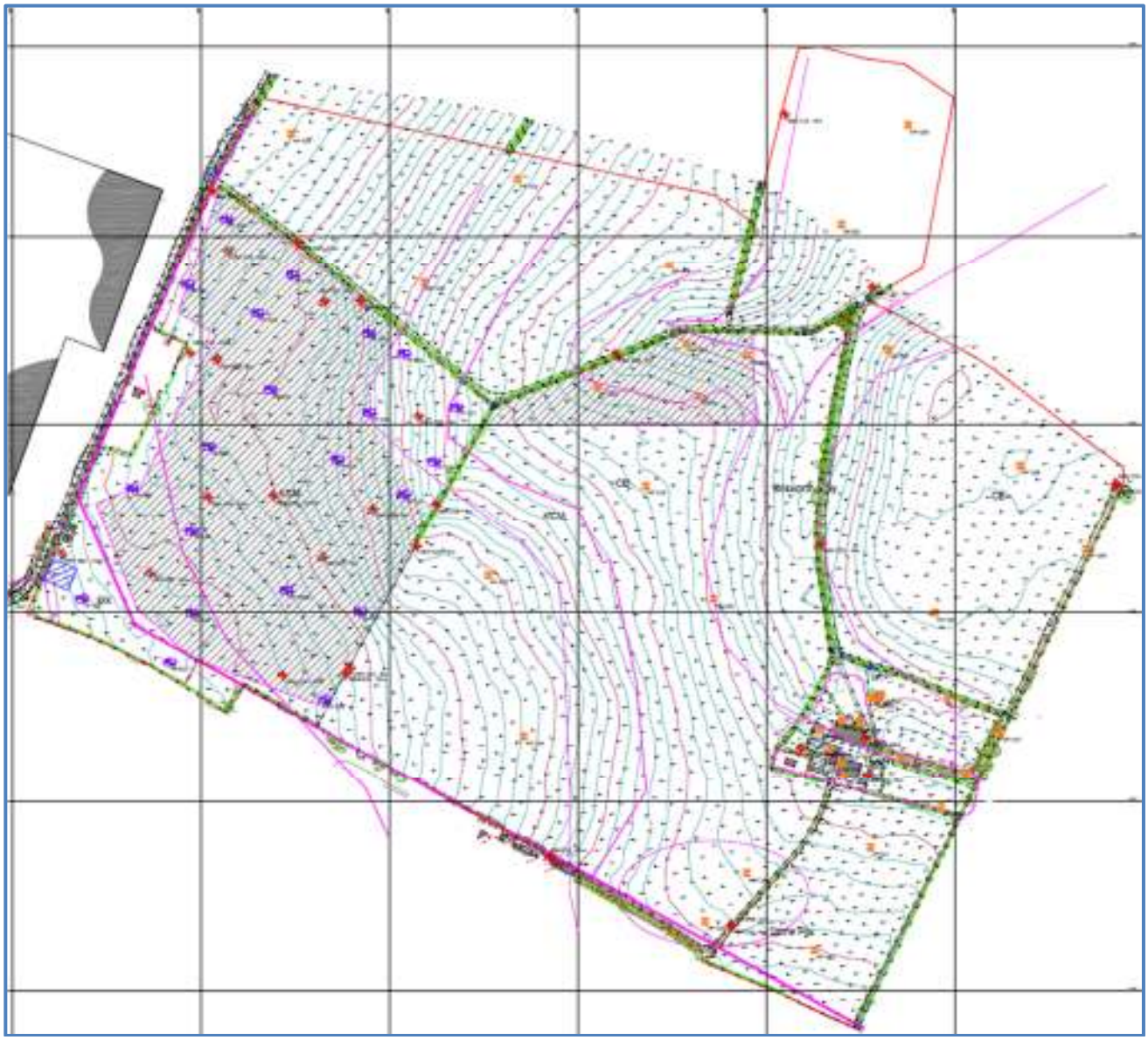
Instruction

EOD Contracts Ltd, have been commissioned by Hydrock to undertake a desktop study for potential historic Unexploded Ordnance (UXO) contamination for the future works at Huntingdon Road Thrapston, Northamptonshire (The Site).

Scope of Work

The scope of this EO Risk Assessment/Desk Study is to assess the likelihood of buried EO/UXO within the environs of The Site (See Figure 1.1), in view of further development. A further aim was to evaluate the implication from UXO contamination during any future intrusive land use.

Figure 1.1**:** Clients Supplied Site Diagram, This DTS will be covering all areas highlighted.



Restrictions

It must be emphasized that a desk study can only indicate the potential for UXO to be present on the site.

This study was written with the site conditions prevailing at the time of the study and no liability can be accepted for any change in the condition of the area.

Please note that our appraisal relies on the accuracy of the information contained in the documents consulted and that EOD Contacts Ltd will in no circumstances be held responsible for the accuracy of such information or data supplied.

Sensitive Documentation

Information may be classified, restricted or deemed to be confidential in nature to EOD Contracts Limited, where such material has been gained a summary of the documentation has been approved.

Objective

The objective of this document is to define the UXO contamination routes as defined in Unexploded ordnance (UXO) A guide for the construction industry (C681) dated July 2009 and offer remediation methodologies if required.

CIRIA Frame Work

The CIRIA report is intended to provide good practice guidance (code of practice) on how to identify whether a site is likely to be at significant risk of UXO encounter and, if so, to set-out a process that will allow this risk to be managed. To be effective this process must start early in the life of the project (usually before intrusive works commence) and have involved Clients, Advisors and Principle Contractors. Therefore, the ground contractor should be provided with a systematic appraisal of the UXO risk when they become involved. The CIRIA report recommends the following stages be undertaken as part of the risk management process:

- Phase 1 Preliminary Risk Assessment
- Phase 2 Detailed Risk Assessment (Completed and updated in this document)
- Phase 3 Risk Mitigation (The act of ameliorating the risk, the clearance methodology)
- Phase 4 The UXO Risk Management and Implementation Plan

PART 2: SOURCES OF INFORMATION

Research of the site's history, with regard to military usage, bombing raids and bomb impacts has been undertaken to establish the following:

- Frequency and intensity of enemy bombing raids for the site and immediate vicinity up to 500m.
- Bomb impacts and associated damage on the Site and in the immediate vicinity.
- The potential for UXO to remain on the Site and in the vicinity.
- Records of UXO removal activities for the Site and immediate vicinity.
- The main sources of information consulted include:
- EOD Contracts Ltd company records
- Ministry of Defence records
- Central and Local Government Records
- Public Records Office (Kew)
- Historic Maps and Air Photography
- Open Source information (Internet)

Ministry of Defence (MOD) Records

33 Engineer Regiment (Explosive Ordnance Disposal) Royal Engineers is the unit responsible for maintaining the records concerning conventional Bomb incidents, reports, clearances and related UXO matters. These records are known to be incomplete and are no longer supplied. Based on in-house information released by the MOD previously, it is considered unlikely that any information released will have any significant impact on the findings of this study.

Attack Record Keeping

In general, the quality and accuracy of bombing and shelling records prior to 1942 varied greatly from one region to another. Records relating to the limited air attacks on the United Kingdom are considered to be sufficiently accurate in urban areas to provide a reasonable level of confidence in determining the likelihood that an area was or was not bombed during this period. Wartime records, maps etc held within the civil archives are considerably more comprehensive than those still in existence within the MOD, where it is acknowledged that large numbers of records have been disposed of since 1945. Records from some areas, particularly rural districts or near large bodies of water should still be regarded as an incomplete picture of the extent and effect of the bombing campaign.

Attack Record Accuracy

While an Air Raid was in progress it was inevitable that mistakes would be made in the transcription of rushed verbal reports into the written records. Discrepancies did occur between the total of bombs dropped against detonations witnessed. In some cases records were made several hours after the event and mistakes were inevitable. Some reports were drafted before the full extent of the raid had been determined which has led to significant omissions in the records. Reports of raids on rural areas were often witnessed and submitted by untrained individuals and passed through third parties

before being recorded. Suspect UXBs occasionally went unreported by local farmers and freeholders who saw the event as insignificant, or were reluctant to report their findings for fear of valuable land or crops being destroyed by the authorities in their attempts to find the UXB. It should also be noted that bomb strikes in water were notoriously difficult to spot, particularly if the bomb had failed to detonate. As a result bomb record accuracy in areas containing large bodies of water or marshland is considered to be questionable.

Errors and Omissions

The accuracy of bombing records has been shown to vary greatly; this may have been a result of the individual record keeper's expertise. Additionally, in some cases, errors occurred as a result of poor or incomplete transcription and copying. Some "errors and omissions" were intentional, designed to serve as dis-information to confuse German intelligence. So long after the event, official verification of such incidents has often proven to be impossible to obtain. At present, UXBs are found on construction sites and other locations where there had been no documentary evidence to suggest their presence. These events, although infrequent, do serve as confirmation that records cannot be considered definitive.

Bibliography

The significant published documents referred to during this study are listed below:

- HO 193 series from National Archives
- HO 198 series from National Archives
- The Blitz Then and Now Volumes 1 to 3
- AA Command Colin Dobinson
- German Air Raids on Britain 1914-1918

PART 3: SITE DESCRIPTION AND DETAILS

Location

The site is located east of Thrapston an industrial town in North Northamptonshire, England. During WWII the site was within the Air Raid Precautions reporting area Region (3) North Midlands HQ Nottingham (Mansfield).

Table 3.1 Site Location

Title	Description (Centre of Site)
Address	Huntingdon Road Thrapston, Northamptonshire
Post Code	NN14 4NJ
Grid Reference	TL0161578249
OS (X)	501615
OS (Y)	278249

Description and Current Usage

The site is approximately 84ha of pastureland including a farm complex, with treed areas and hedgerows. The site is bounded to the north by pastureland, to the east by an unnamed road, to the south is the A14 and to the west is an Industrial Estate.

Geology

BGS (British Geological Survey) nearest borehole see Figure 3.1 indicates the following geology:

Table 3.2 Geology

Geological Unit Description	Anticipated Thickness (m)	Anticipated Depth (m bgl)
Made Ground/Top Soil	0.6	0.6
Clay	10.5	11.1
Sand and Gravel (End of Log)	0.9	12

Figure 3.1 Borehole Location (www.bgs.co.uk)

Future Works

At the time of writing this report it is understood that the site will be redeveloped (the exact scope of works is not known at this time). The supplied requirement is for, geotechnical investigations, possibly percussive drilling/trial pits/window/samples.

PART 4: HISTORICAL REVIEW

Historical Mapping and Aerial Photography

The air photograph and historical maps in Annex B have been reviewed and a brief synopsis is in Table 4.1:

Table 4.1 Aerial Photograph and Historical Map Synopsis

Date	Scale	Description/Remarks
1938-1951	1:10,560	The site is open pasture/farmland farm buildings are on the eastern side of the site
1938	1:10,000	The site is open pasture/farmland farm building are on the eastern side of the site, no obvious signs of bomb damage
2021	1:10,000	Shows present configuration of buildings and usage, the A14 bypass was constructed post 1985 and the industrial estate to the west of the sitre starts construction in the late 1990s

WWI

Although many people associate wartime bombing with The Blitz during World War II, the first airborne terror campaign in Britain took place during the First World War. Air raids in World War One caused significant damage and took many lives. German raids on Britain, for example, caused 1,413 deaths and 3,409 injuries.

Site Specific Bombing Information

The map shown in Annex C indicates the Site was not the subject of bombardment throughout WWI.

WWII

Bombing started as early as October 1939, by the end of the WWII the Luftwaffe had dropped approximately 50,000 tonnes of high explosive bombs and 110,000 tonnes of incendiary bombs, this caused over 40,000 UXBs, killed 43,000 people and over 250,000 homes were destroyed.

Thrapston in the Blitz

- No records of bombs being dropped
- A single noted event is a German bomber being pursued across the sky over Thrapston and being shot down near Kettering

Site Specific Bombing Information

Record of air raids and incidents in the vicinity of the site have been scrutinized, no bomb impact were noted on or near the site.

Abandoned Bombs/UXO

EOD Contracts records could find no evidence of any abandoned Bombs in or around the subject site.

Bomb Damage

No bomb damage has been noted.

Anti-Aircraft Artillery

The nearest recorded location of heavy anti-aircraft gun (HAA) position is 12km from the site.

Explosive or Munition Factories

No explosive or munition factories were noted, the site was a reservoir.

Military Usage

A Light Anti-Aircraft (LAA) Battery was on site, the equipment for an LAA Battery ranged from a Lewis Gun (SAA) up to a 40mm Bofors (projectile ammunition), however the equipment for this battery is unknown, south of the A14 is a Royal Army Service Corps Camp. Built as an army camp during World War II, and housed the Royal Army Service Corps for nearly all of that war. Other units used it during the latter months of the war and for a period afterwards Thrapston (AAF-584) WWII US Army 6th Medical Supply Platoon 46th Medical Supply Platoon, the aforementioned locations are mapped in Annex D.

Prior Clearance Operations

EOD Contracts could find no evidence to suggest that there have been any prior UXO clearance operations in or around the site footprint.

PART 5: SOURCES OF UXO CONTAMINATION

The main sources of UXO contamination that have been researched for the site are:

- Air delivered ordnance bombs and sub-munitions/incendiaries
- Anti Aircraft Ammunition (AA)
- Explosive or Munition Factories
- Military Usage

General

No UXO contamination pathways from:

- Air delivered ordnance bombs
- The Anti Aircraft Weapons(AA) is on site, however this is a Light AA system
- No recorded use as an Explosive or Munition Factory
- Has had no direct Military Usage

UXOs are essentially dangerous; therefore, further information on UXO and Safety is detailed in Annex E.

Bomb Penetration Depths

The weapon penetration depths have been assessed as part of the tables in Annex F, however as no bombs were recorded no further information on bomb penetration is required.

Further information on bomb depths and J Curves is in Annex E.

PART 6: RISK ASSESSMENT

Risk Assessment

Assessing both the likelihood of occurrence and the consequences of the encounter has derived the overall risk for the site from unexploded ordnance. Review of the site's history and geographic location can provide an overall likelihood of encounter factor, which is used in the subsequent determination of a risk level when a Figure can be determined for the consequence.

Likelihood of Encounter

Given the study findings and other criteria (See Annex F Tables) it is considered that there is a **LOW** risk of encountering UXO within the site footprint. This finding is based on assessment of all of the available information and taking account of the following factors:

- It is a matter of historic record that the site was not subjected to enemy attack. No records pertaining to bombing incidents were discovered
- The LAA Battery usage is assumed to be low, as no bombing incidents were noted
- The military camp south of the A14 was a RASC depot and not used for ammunition storage

Encounters of UXO are not uncommon, recent UXO finds are in Annex G.

Consequence of Encounter

The consequence see Annex E of an uncontrolled encounter with UXO, given its lethal design and its unpredictable nature could be catastrophic and warrants a high severity factor. With regards to the consequences, the following factors were considered:

The project works may make use of a number of common ground investigation and construction techniques in its methodology during the project. Any intrusive groundwork has the potential to encounter UXO.

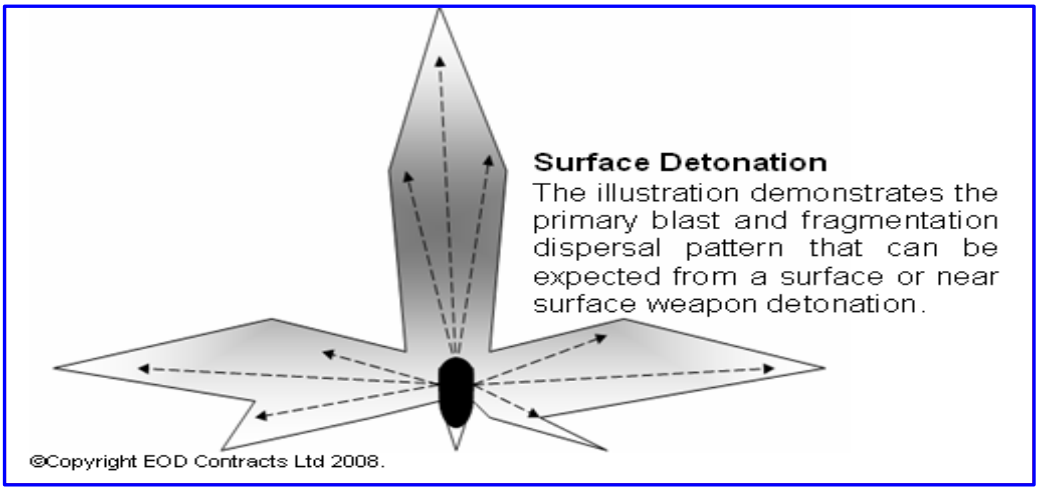
Intrusive earthwork, piling driving and dynamic ground compaction are by nature, aggressive, significant force (kN) is often required to achieve the desired results. As a precaution it is prudent to assume that any external stimulus, no matter how slight, may result in an unstable weapon detonating.

Records of encounters with UXO, particularly where plant machinery has been involved have resulted in detonations of the items with varying degrees of consequence; ranging from slight injuries sustained to piling contractors when a bomb detonated at 6.0m bgl to fatal injuries sustained to a construction worker while conducting near surface machine works on a motorway.

Detonation on land; the effects of a detonation at depth will be more localised and less destructive than one occurring on the surface. Figure 6.1 shows an illustration of the primary blast and fragmentation dispersal from explosive ordnance when it detonates on the surface. The weapon's design, and other key factors such as the ratio of explosive charge weight to total weapon weight (CWR) and the Net Explosive Quantity (NEQ) will determine the size and effects of a blast. The effects will also be enhanced or reduced by a number of factors including, the presence of other energetic materials in close proximity to the blast or if the weapon is buried or exposed on the surface. As a guide Annex E Table 1 gives an indication of the likely blast radius for common types of UXO.

Figure 6.1: Primary Blast & Fragmentation on Land

Blast and fragmentation dispersal.



In addition to the dangers of explosion, many common chemicals used in the manufacture of explosive ordnance fillings are; in sufficient quantity, and level of exposure, toxic or poisonous. Although it is unlikely that such chemicals would be encountered in significant quantity to represent a significant risk to personnel, leakage or venting could pose a risk to the local marine environment. In addition to heavy metals; copper, lead, zinc etc used in the weapon body and fuze, hydrocarbon propellants such as Kerosene may also be present.

Risk Level

The overall risk has been determined to apply to all of the ground within the site footprint. The prevailing risk level has been determined to be **LOW**.

PART 7: CONCLUSIONS

Based on the information researched by EOD Contracts Ltd for the proposed scope of works being carried out within the given site area, the following conclusions have been reached:

Historical UXO Contamination

The indicators for UXO contamination are:

Bomb Strikes	No recorded bomb strike in the vicinity of the site
Bomb Damage	No bomb damage was noted
Reconstruction	No reconstruction was noted
Military Usage	A Light AA Battery was on site; however, the usage is assumed to be low with a probable weapon system that utilise Small Arms Ammunition (bullets). A military camp was to the south of the site, this was not an ammunition storage facility
Explosive/ Munition Factory	The site was not used in the production of explosives or munitions

Risk Level

The overall risk has been determined to apply to all ground works within the site footprint.

Risk Level	Therefore, so far as reasonably practicable the risk level on site is deemed as **LOW**.
Risk Depth	The expected bomb depth is not applicable.

PART 8: RECOMMENDATIONS

It is recommended that, due to the site having an LAA Battery and a nearby military establishment it would be deemed prudent for all personnel carrying out intrusive works to have:

Safety Training; UXO safety awareness training should be given at all levels of site personnel and selected individuals on the project staff with relevant responsibilities. The training should be provided by a competent person as part of the project safety induction course. It should be reinforced with specific safety briefings and tool box talks to individuals involved in conducting intrusive earthworks. The training should cover the following topics to a level commensurate with the audience's responsibilities and duties:

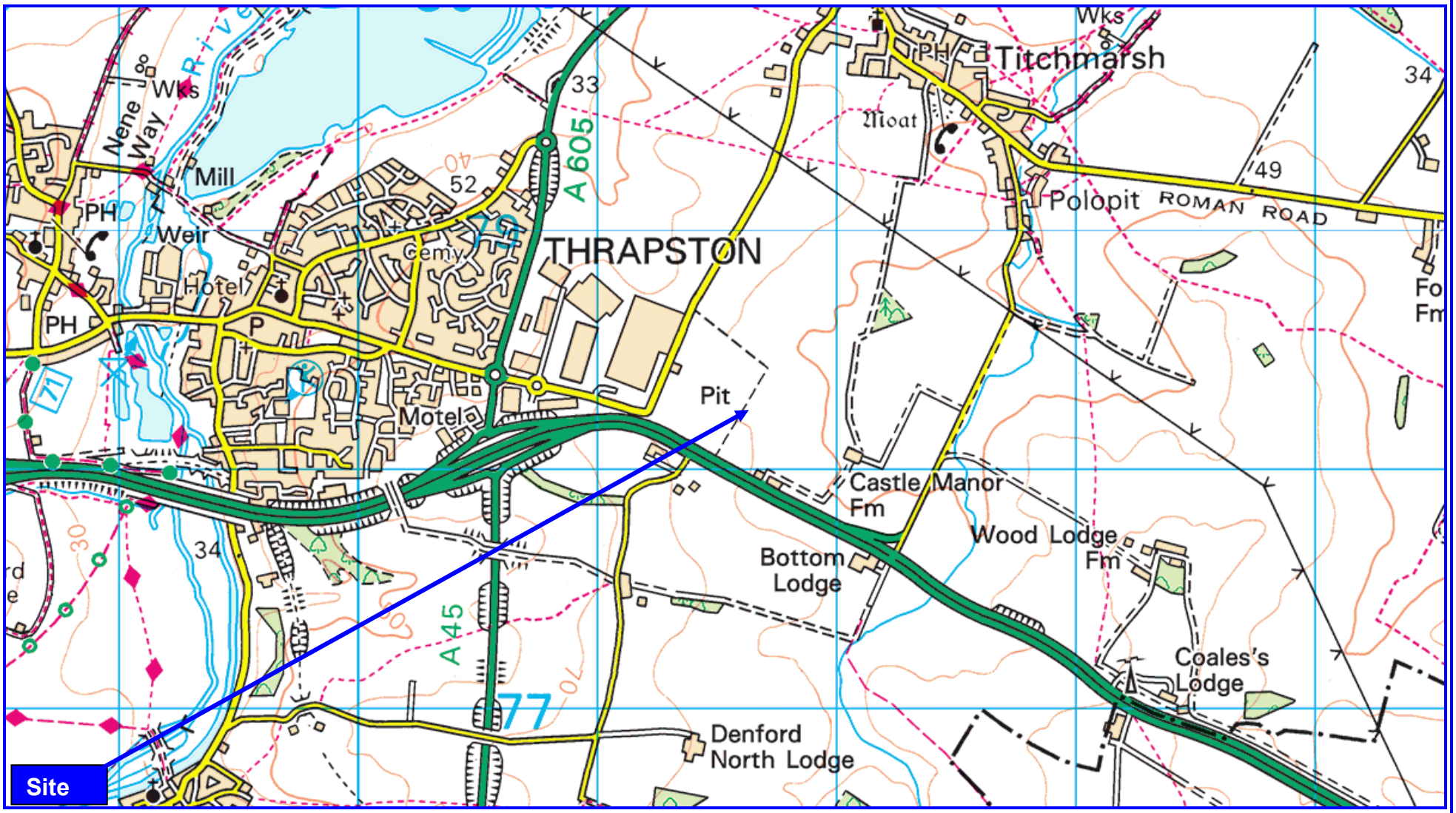
- Project overview and the responsibilities of those working on site with regard to duty of care and public safety

- UXO recognition and safety procedures to be followed on discovery of a suspicious object or the alarm being sounded

No further UXO risk mitigation strategies are required.

Annex A

SITE LOCATION



Annex B

HISTORIC AERIAL PHOTOGRAPHS AND MAPS

Index of Historical Maps

Historical Mapping Legends

Ordnance Survey County Series 1:10,560

Gravel Pit
Sand Pit
Other Pits
Quarry
Shingle
Orchard
Osiers
Reeds
Marsh
Mixed Wood
Deciduous
Brushwood
Fir
Furze
Rough Pasture
Arrow denotes flow of water
Trigonometrical Station
Site of Antiquities
Bench Mark
Pump, Guide Post, Signal Post
Well, Spring, Boundary Post
285 Surface Level
Sketched Contour
Instrumental Contour
Main Roads
Fenced
Un-Fenced
Minor Roads
Fenced
Un-Fenced
Sunken Road
Raised Road
Road over Railway
Railway over River
Railway over Road
Level Crossing
Road over River or Canal
Road over Stream
Road over Stream
County Boundary (Geographical)
County & Civil Parish Boundary
Administrative County & Civil Parish Boundary
Co. Boro. Bdy.
County Borough Boundary (England)
Co. Burgh Bdy.
County Burgh Boundary (Scotland)
R.D. Bdy.
Rural District Boundary
Civil Parish Boundary

Ordnance Survey Plan 1:10,000

Chalk Pit, Clay Pit or Quarry
Gravel Pit
Sand Pit
Disused Pit or Quarry
Refuse or Slag Heap
Lake, Loch or Pond
Dunes
Boulders
Coniferous Trees
Non-Coniferous Trees
Orchard
Scrub
Coppice
Bracken
Heath
Rough Grassland
Marsh
Reeds
Saltings
Building
Direction of Flow of Water
Shingle
Sand
Glasshouse
Pylon
Sloping Masonry
Pylon
Electricity Transmission Line
Pole
Cutting
Embankment
Standard Gauge Multiple Track
Standard Gauge Single Track
Road Under
Road Over
Level Crossing
Foot Bridge
Siding, Tramway or Mineral Line
Narrow Gauge
Geographical County
Administrative County, County Borough or County of City
Municipal Borough, Urban or Rural District, Burgh or District Council
Borough, Burgh or County Constituency
Shown only when not coincident with other boundaries
Civil Parish
Shown alternately when coincidence of boundaries occurs

BP, BS	Boundary Post or Stone	Pol Sta	Police Station
Ch	Church	PO	Post Office
CH	Club House	PC	Public Convenience
F E Sta	Fire Engine Station	PH	Public House
FB	Foot Bridge	SB	Signal Box
Fn	Fountain	Spr	Spring
GP	Guide Post	TCB	Telephone Call Box
MP	Mile Post	TCP	Telephone Call Post
MS	Mile Stone	W	Well

1:10,000 Raster Mapping

Gravel Pit
Refuse tip or slag heap
Rock
Rock (scattered)
Boulders
Boulders (scattered)
Shingle
Mud
Mud
Sand
Sand
Sand Pit
Slopes
Top of cliff
General detail
Underground detail
Overhead detail
Narrow gauge railway
Multi-track railway
Single track railway
County boundary (England only)
Civil, parish or community boundary
District, Unitary, Metropolitan, London Borough boundary
Constituency boundary
Area of wooded vegetation
Non-coniferous trees
Non-coniferous trees (scattered)
Coniferous trees
Coniferous trees (scattered)
Positioned tree
Orchard
Coppice or Osiers
Rough Grassland
Heath
Scrub
Marsh, Salt Marsh or Reeds
Water feature
Flow arrows
MHW(S) Mean high water (springs)
MLW(S) Mean low water (springs)
Telephone line (where shown)
Electricity transmission line (with poles)
BM 123.45 m Bench mark (where shown)
Triangulation station
Point feature (e.g. Guide Post or Mile Stone)
Pylon, flare stack or lighting tower
Site of (antiquity)
Glasshouse
General Building
Important Building

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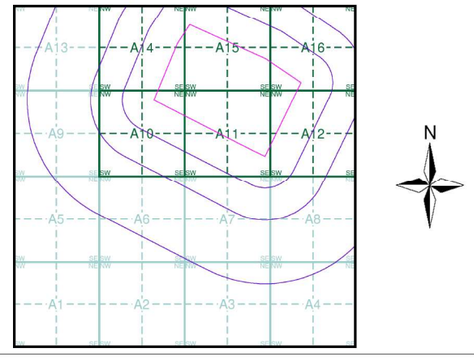
Historical Mapping & Photography included:

Mapping Type	Scale	Date	Pg
Northamptonshire	1:10,560	1885	2
Huntingdonshire	1:10,560	1887	3
Northamptonshire	1:10,560	1901	4
Huntingdonshire	1:10,560	1902	5
Northamptonshire	1:10,560	1927	6
Northamptonshire	1:10,560	1938 - 1951	7
Huntingdonshire	1:10,560	1952 - 1953	8
Northamptonshire	1:10,560	1952	9
Ordnance Survey Plan	1:10,000	1958	10
Ordnance Survey Plan	1:10,000	1969	11
Ordnance Survey Plan	1:10,000	1985	12
Ordnance Survey Plan	1:10,000	1995	13
10K Raster Mapping	1:10,000	1999	14
10K Raster Mapping	1:10,000	2006	15
VectorMap Local	1:10,000	2021	16

Historical Map - Slice A



Order Details

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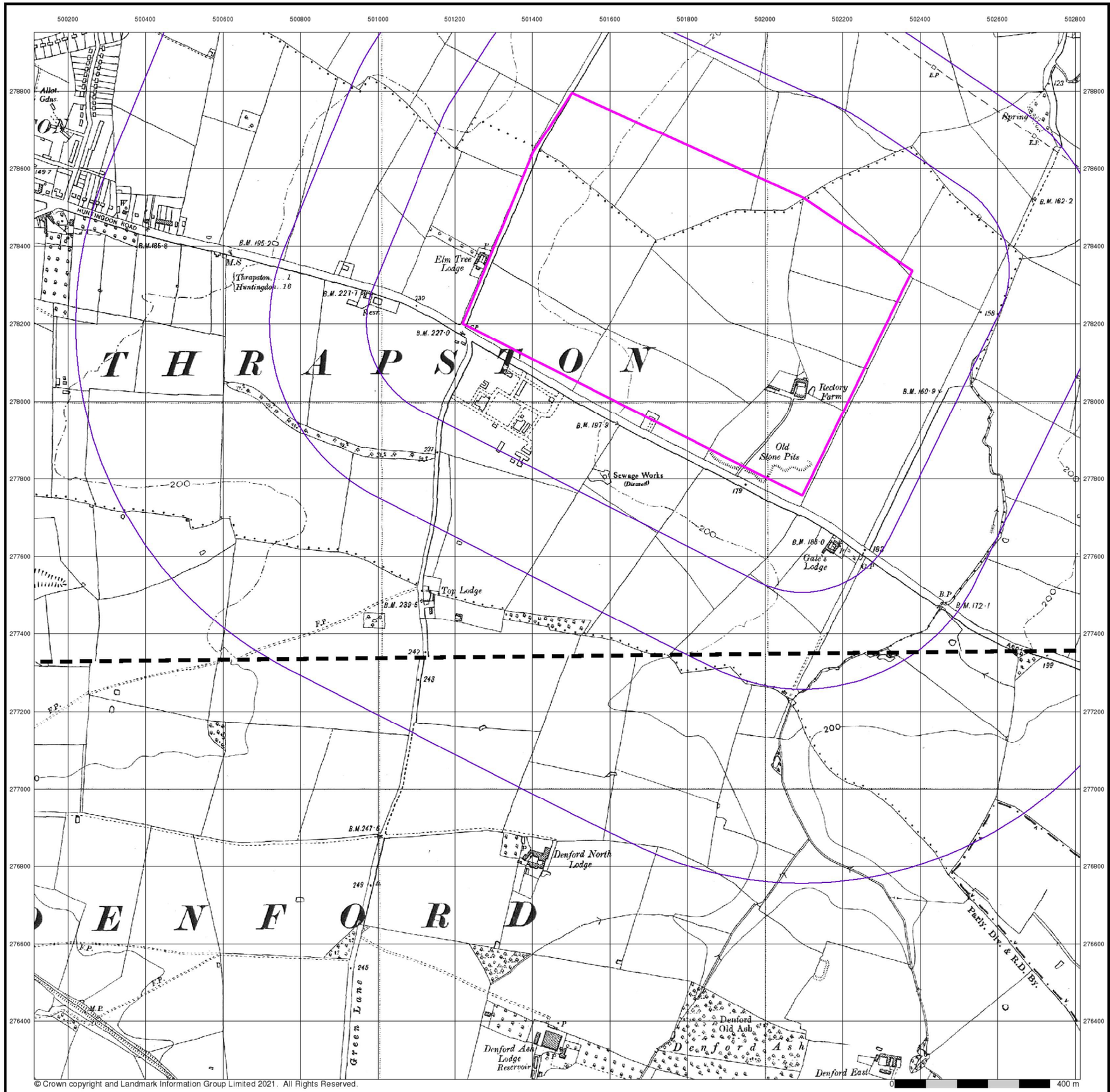
Customer Ref: 21249 Thrapston HYDROCK
National Grid Reference: 501640, 277970
Slice: A
Site Area (Ha): 67.01
Search Buffer (m): 1000

Site Details

Huntingdon Road, Thrapston, Kettering, NN14 4NJ

Landmark INFORMATION GROUP
Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk



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Northamptonshire

Published 1938 - 1951

Source map scale - 1:10,560

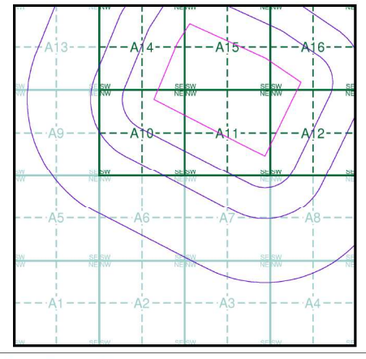
The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840`s. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas. In the late 1940`s, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

Map Name(s) and Date(s)

026SE
1951
1:10,560

033NE
1938
1:10,560

Historical Map - Slice A



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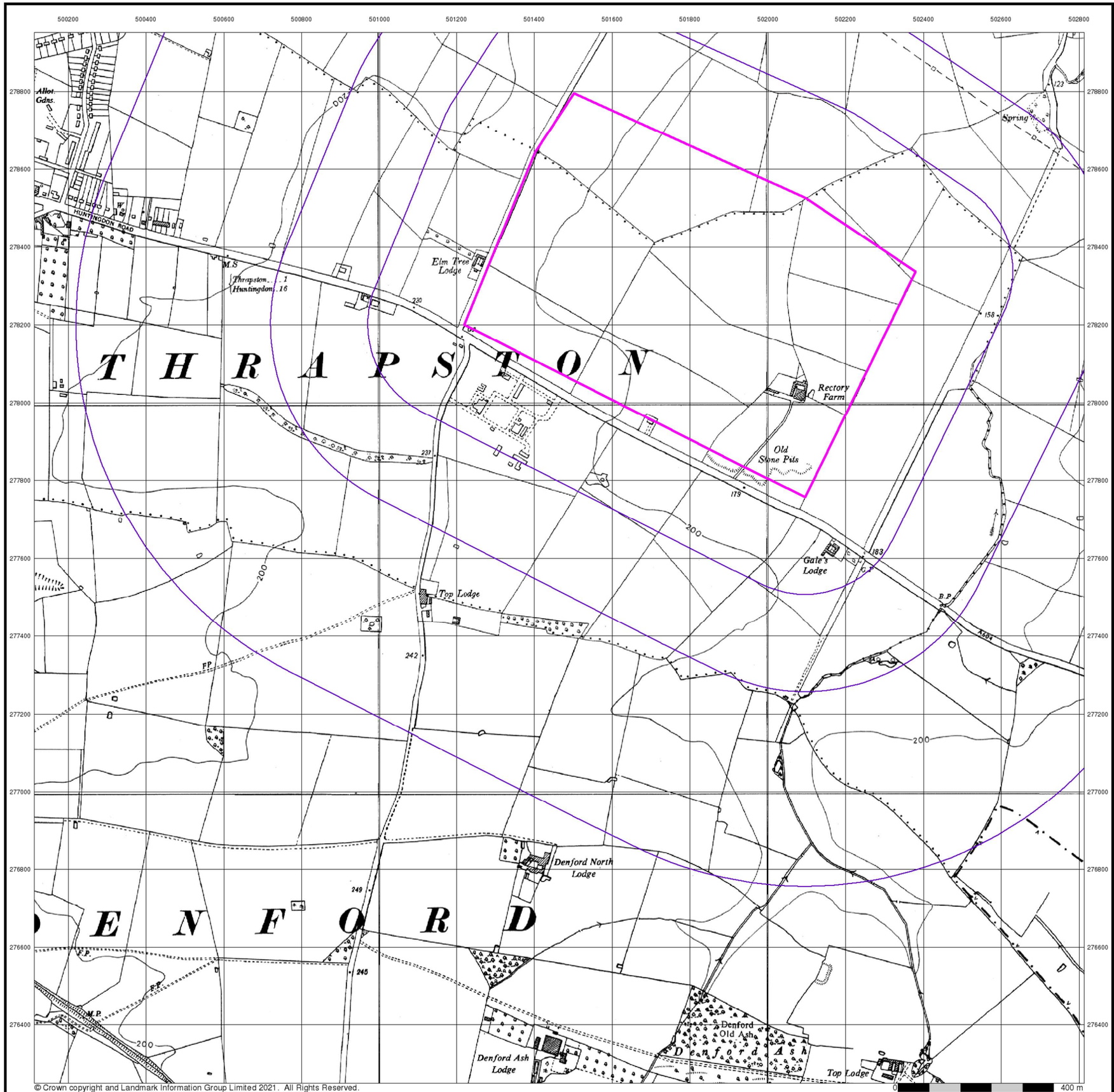

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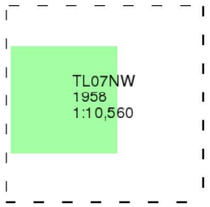
Ordnance Survey Plan

Published 1958

Source map scale - 1:10,000

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840`s. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas. In the late 1940`s, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

Map Name(s) and Date(s)



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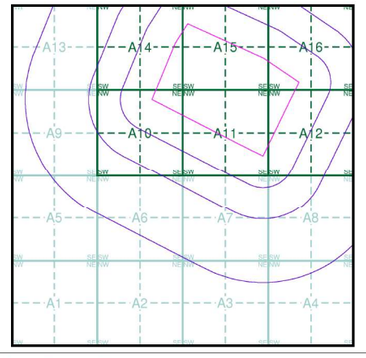

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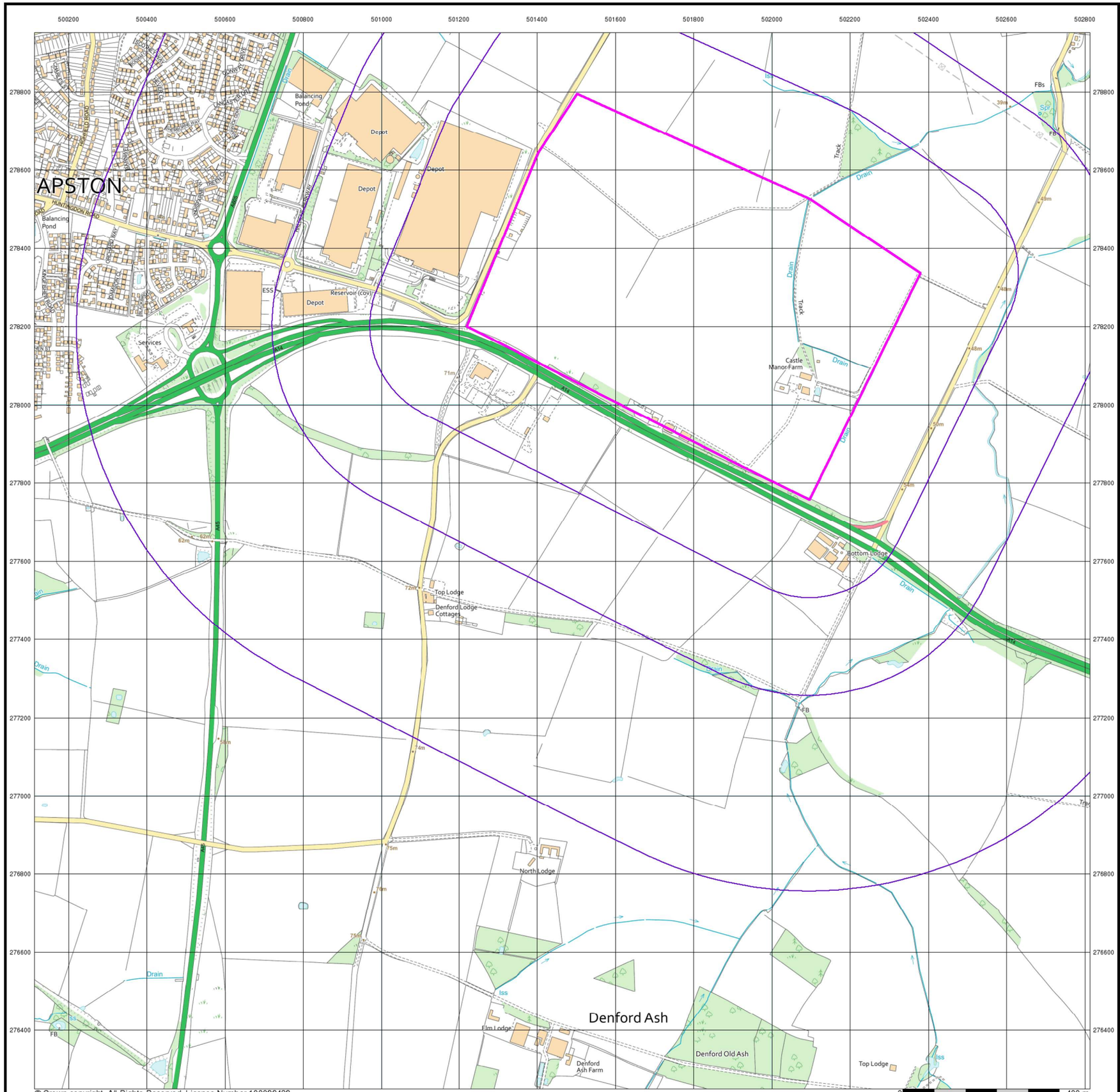

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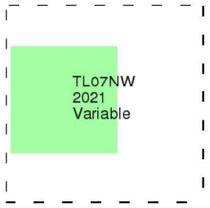
VectorMap Local

Published 2021

Source map scale - 1:10,000

VectorMap Local (Raster) is Ordnance Survey's highest detailed 'backdrop' mapping product. These maps are produced from OS's VectorMap Local, a simple vector dataset at a nominal scale of 1:10,000, covering the whole of Great Britain, that has been designed for creating graphical mapping. OS VectorMap Local is derived from large-scale information surveyed at 1:1250 scale (covering major towns and cities),1:2500 scale (smaller towns, villages and developed rural areas), and 1:10 000 scale (mountain, moorland and river estuary areas).

Map Name(s) and Date(s)



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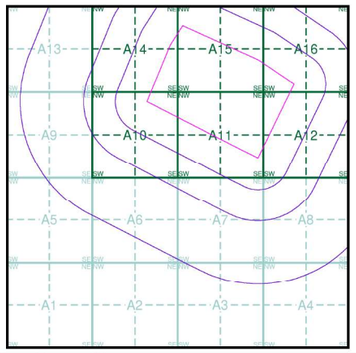

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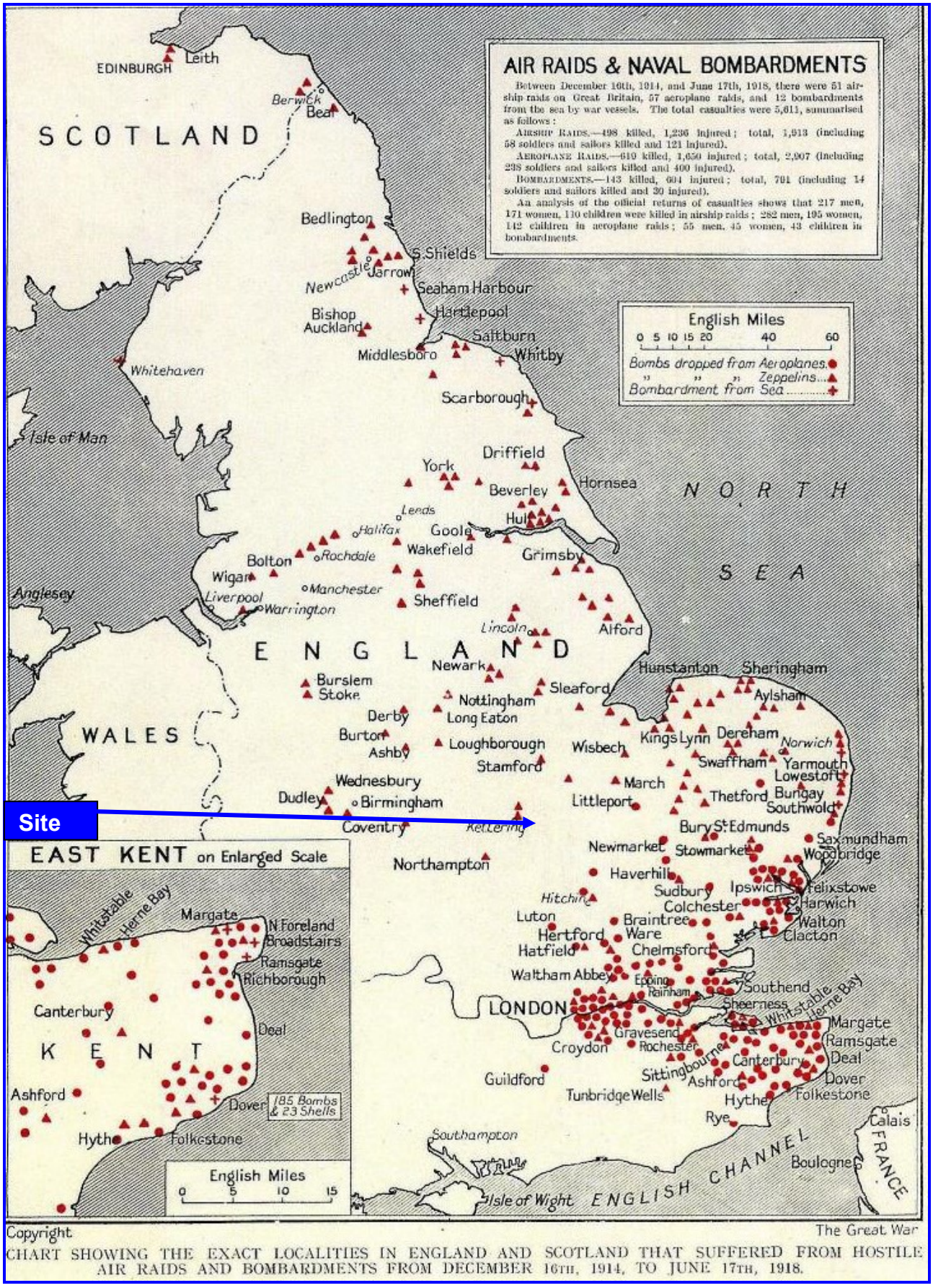
Annex C

BOMB RAIDS WWI



Annex D

UXO CONTAMINATION PATHWAYS

Site Position →

Annex E

EXPLOSIVE ORDNANCE SAFETY AND INFORMATION

UNEXPLODED ORDNANCE

Since the end of WWII, there have been a limited number of recorded incidents in the UK where bombs have detonated during engineering works, though a significant number of bombs have been discovered.

The threat to any proposed investigation or development on the site may arise from the effects of a partial or full detonation of a bomb or ordnance item. The major effects usually being shock, blast, heat and shrapnel damage. It should be noted that the detonation of a 50kg buried bomb could damage brick/concrete structures up to 16m away and unprotected personnel on the surface up to 70m away from the blast. Larger ordnance is obviously more destructive. Table 1 denotes recommended safe distance for UXO.

Table 1: Safety Distances for Personnel

UXO (Kg)	Safety Distances (m)			
	Surface UXO		Buried UXO	
	Protected	Unprotected	Protected	Unprotected
2	2O	200	10	20
10	50	400	20	50
50	70	900	40	70
250	185	1100	120	185
500	200	1250	140	200
1000	275	1375	185	275
3000	450	1750	300	450
5000	575	1850	400	575

Explosives rarely become inert or lose effectiveness with age. Over time, fuzing mechanisms can become more sensitive and therefore more prone to detonation.

This applies equally to items that have been submersed in water or embedded in silt, clay, peat or similar materials.

Once initiated, the effects of the detonation of the explosive ordnance such as shells or bombs are usually extremely fast, often catastrophic and invariably traumatic to the personnel involved.

The degradation of a shell or bomb may also offer a source of explosive contamination into the underlying soils. Although this contamination may still present an explosion hazard, it is not generally recognised that explosives offer a significant toxicological risk at concentrations well below that at which a detonation risk exists.

BOMB PENETRATION DEPTHS

Weapons penetrate a significant depth into the ground and other types of ammunition are designed to permit the weapon time to penetrate deeply into the target before detonating a short time after coming to rest or a considerable number of hours afterwards. The second reason is where the weapon has failed to function as designed becoming a UXB. A number of studies have been carried out into weapon penetration and it is an inevitable consequence of a number of variable factors acting on the bombs trajectory that figures can and do differ significantly. Careful consideration must be given to the weapon's velocity, trajectory and shape. Also surface conditions and subsurface geology. The largest of the common German bombs, (500kg) can

penetrate to significant depths given favourable conditions for penetration. In the case of projectiles and shells, the potential for deep penetration is significantly less.

A number of assumptions were used in determining the maximum threat depth within the project footprint, which were;

The penetration of sub-surface bombs will be affected by the following:

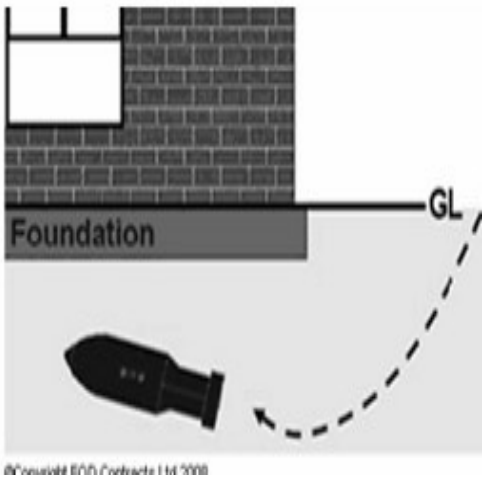
- Height of release
- Weight, shape and design of bomb
- Aerodynamic qualities
- Angle of flight and impact
- Nature of impact surface
- Nature of sub soil

Bombs on penetration of the surface do not follow a straight-line trajectory they can and do curve; this is called a “J” curve where the bomb’s path bends back towards the surface. This gives what is known as the Offset, which may place a bomb under a structure and at a shallow depth.

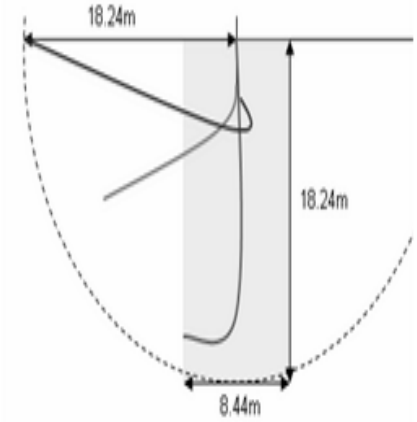
Figure 1*:* Sub-Surface Trajectories & Safety Buffers

Sub Surface Trajectory.

Common Sub-Surface Trajectory [6]



Anomalous Sub-Surface Trajectory [7]



Distances shown are for example only.

Sub-surface Trajectory Incursion [8]

Note; *the common sub-surface trajectory will follow a path best described as a 'J' curve. The curve can result in a weapon coming to rest some distance from its impact point. The distance from impact point to resting place is referred to as the "Off set Distance and is normally considered to be 1/3 of the depth. This mechanism can permit a weapon to strike outside a building and travel below ground finally coming to rest within the building footprint. Where a strike is known to have occurred close to a building or structure such as a dock wall, a danger zone should be considered to exist around the area of the strike of sufficient size to accommodate the likely sub-surface travel distance for the weapon.*

Note; *the typical offset distance is shown as the shaded area, on rare occasions a near surface deflection of the weapon can occur and the offset distance can be substantially increased up to 5/4 of the penetration depth. This mechanism does however reduce the penetration depth considerably with the net result that while the offset is increased the overall travel distance is for the most part unaffected.*

Note; *scenario 1 shown top left shows a hypothetical bomb strike outside a structure or building. The strike location has been accurately identified and as a consequence; a potential danger zone (circular shaded area) can be placed around the point of impact. Scenario 2 shown top right; depicts a direct HE bomb or Incendiary strike within a building which totally destroyed the building. In circumstances such as this UXB entry the building rubble may have concealed hole and the weapon may still be present within the building footprint or it may have travelled sub-surface and come to rest outside the footprint. Here the danger zone (square shaded Area) extends outwards on all sides of the original building footprint.*

TYPES OF ORDNANCE

German Air Delivered Ordnance. Technical information on the nature and characteristics of the ordnance used by the German Air Force during both world wars has been available for a number of years. Assessment that began during the 1930's has continued to the present day. Experts have conducted research in many countries as part of national research programmes and as individual research projects. Consequently a well-informed assessment of the threat posed by unexploded ordnance, and the hazards that they represent, can be made with a high degree of confidence.

Terminology. It should be noted that two terms used in bomb records can lead to some confusion as to their meaning and therefore significance. The term Unexploded Bomb (UXB) refers to a bomb that has fallen, failed to function and has been subsequently dealt with and removed from the site. The term Abandoned Bomb (A/UXB) refers to a UXB that could not be found or recovered, or the decision was taken not to pursue the matter further. Consequently the unexploded bomb remains where it came to rest when it was dropped or fell to the present day. It should also be noted the word 'bomb' can be used to describe an airdropped bomb or a shell as in some cases no differentiation was made and the term was interchangeable.

Abandoned Bombs. The records of known abandoned unexploded bomb locations in the London area were released in response to a written Parliamentary Question from Simon Hughes. (Hansard: Volume; 282. Dated 15th October 1996). The information was provided by the Ministry of Defence (MOD) and supplied under an indemnity.

Explosive Ordnance Failure Rates. Over the course of both World Wars a considerable quantity of ordnance dropped on UK targets failed to function as designed and subsequently penetrated the ground without exploding. Information gathered during the war by the MOD and its research partners provide typical failure rates for different types of ordnance. Figures significant to this study are:

- 10% of all German airdropped bombs failed to function as intended
- 30% of all anti-aircraft and other types of shells failed to function as intended

Deductions & Considerations. The following points were considered as part of the assessment and have been given due consideration:

Records were found that indicated that the general area was subjected to heavy bombing.

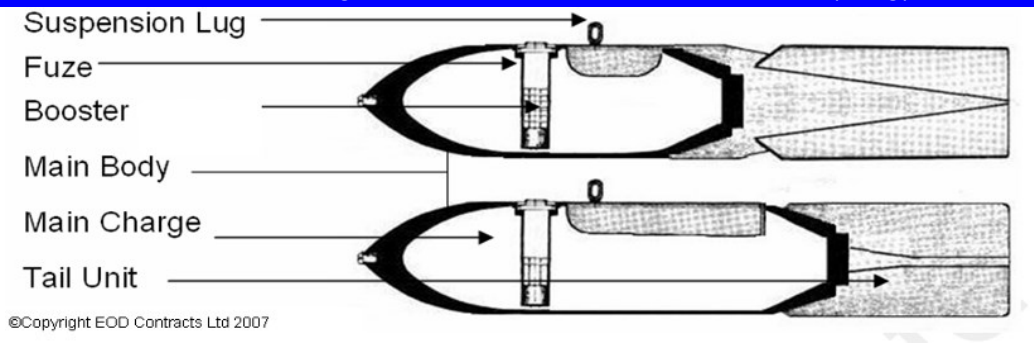
Bombs, which struck previously, hit or burned out targets and did not function; consequently their impact was unseen and therefore no report was ever made.

In all likelihood, the local anti-aircraft battery would have fired a far higher number of shells than the bombers dropped HE bombs. Contamination by anti aircraft shells can not be rules out.

Generic German Bomb Types. The majority of German bombs dropped were 50kg in weight, accounting for approximately 16% of the total bombs dropped. The range of common bombs increased in weight to a maximum of 1700kg. Regardless of size, German bombs were fitted with one or more Electrical Condenser Resistance (ECR) fuzes many of which included a mechanical component. The fuzes were mounted transversely in the bomb body with the booster directly below, and in contact with, the fuze. The booster; sometimes referred to as the Gaine, is composed of a sensitive explosive material (Picric Acid). Picric Acid is known to deteriorate over time becoming increasingly unstable. The internal layout of two common German bombs and a German fuze is shown in Figures 2 & 3.

Figure 2: Generic German Bomb Design.

Graphic Cross Section through the most common German bombs (50kg)



Note; the diagram shows that there can be a significant difference in the quantity of High Explosive contained within bombs of similar size and shape; the Grade 1 bomb on the bottom having 30% more HE than the Grade 2 shown at the top. This serves to demonstrate the importance of an accurate identification of any item of UXO.

Figure 3: Generic German Bomb Fuze Design.

Graphic Cross Section through a typical German fuze (ECR)

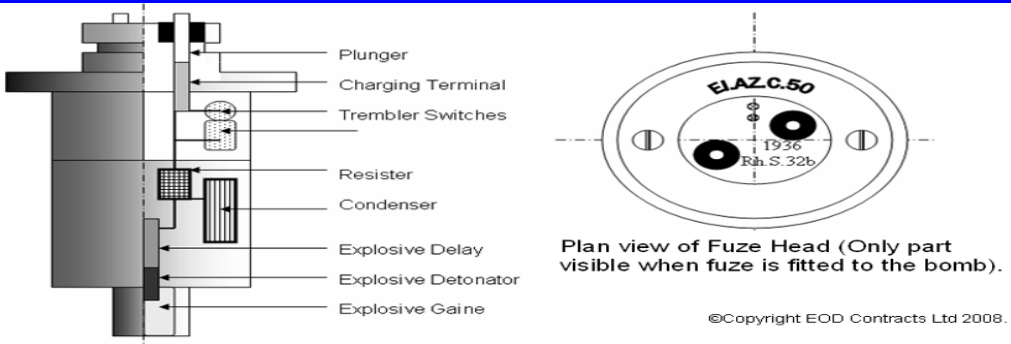


Figure 4: Range of HE bombs dropped on the United Kingdom.

German Bombs

NOTE: The smaller sub-munitions (Bomblets) seen to the right, ranged in size between 1 and 3kg, were dropped in large numbers and were intended as incendiary bombs, anti-personnel bombs or as bombs filling both roles. The smaller bomblets were dropped in larger container bombs designed to hold between 360 and 620 of the bomblets. The containers were designed to burst open at a predetermined height above ground level, dispersing the bomblets over a wide area. Air raid damage was far greater by using both incendiary, and HE bombs on a single raid. The fires started by the incendiaries being rapidly spread by the blast waves from the HE bomb. This scenario was shown to devastating effect on the 14th February 1945 in the German city of Dresden. Where fires started and spread by the bombing increased to a point where the oxygen was being sucked into the flames at such a high speed that the fire became a "Fire Storm". At the time the city's population had increased due to a high number of refugees fleeing the Russian advance to the east, the exact civilian death toll from fire and suffocation will never be known, but is considered to be somewhere between 25,000 and 100,000.

High Explosive (HE) Bomb. Some of the most common type of ordnance to be dropped on the United Kingdom, HE bombs are often the type encountered as UXBs. Relatively thick cased, they are still recovered in remarkably good condition. Ranging in size from 50 to 1700 kg, their typical release height (1,500m) allowed them to penetrate deep into the ground as a result of design or flaw. Towards the end of the bombing campaign, as steel became scarce the German Engineers produced a range of bombs that used steel reinforced concrete as the bomb body. Figure 4 shows the range of steel HE bombs dropped on the UK.

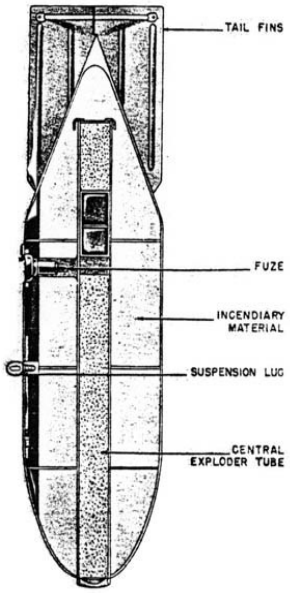
Incendiary Bomb. The larger incendiary bombs, containing bottles of white phosphorus and an incendiary mixture contained within a thin steel case were designed to burst on contact with the ground. A fixed dispenser on the aircraft delivered the smaller type of bomb or 'Bomblet' to the target area in container bombs or; both types of container would open dispersing the smaller Incendiary bombs. Relatively small and light they were unlikely to penetrate the ground to any significant depth. However, once concealed in bomb damage rubble or below water they were easily missed and are still unearthed today from in-fill and drained land. Later versions of the incendiary bomb contained an additional explosive charge used as a short delay "Booby Trap" device that contained a significant amount of high explosive. The Booby Trap component was designed to kill or injure fire fighters and hinder the damage control. See Figure 5.

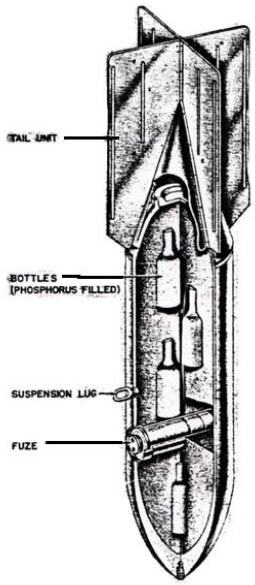
Figure 5: Incendiary Bombs.

Common German Incendiary Bombs

250 mm

Above 1kg incendiary bomblet, below left the larger 500kg incendiary bomb Below right a 50kg incendiary bomb containing bottles of white phosphorus.



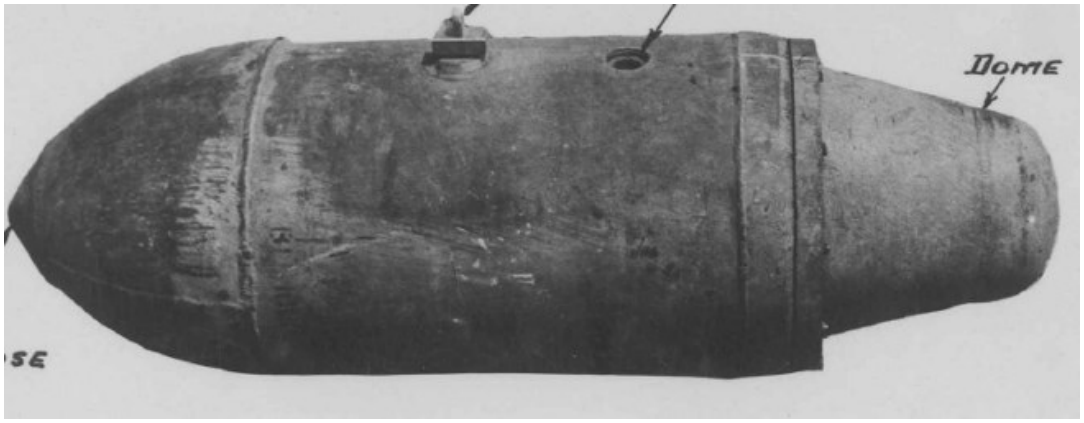


Note; Incendiary bomblets were made of a flammable alloy similar in appearance to aluminium, which resists corrosion well. The tail unit was made of thin tin-plate steel and is more prone to have rusted away. Some Incendiary models were fitted with a High Explosive (HE) steel nose. With the tail and explosive nose attached the bomb was 480mm long.

Blast Bomb / Parachute Mine. The parachute mine was extensively used on land and at sea and was fitted with specialist fuzes designed to trigger the weapon at a predetermined altitude, water depth or to switch on other magnetic influence mechanisms to trigger the weapon when a ship approached (Magnetic or Acoustic influence). While early versions were based on the standard 1000kg SD Bomb case others were specially designed and manufactured with an aluminium body, making them extremely difficult to detect using magnetometers. The thin cased versions would normally disintegrate on impact on land and are normally considered to pose little threat to work on land based projects, but the risk increases significantly on projects over water or in marshland. Thicker cased versions however will survive impact and pose a significant risk regardless of the local ground conditions. (See Figure 6)

Figure 6: Common Airdropped Mines.

Parachute & Ground Mines



Note; all mine fuzes were designed to arm after deployment from the ship, submarine or aircraft, some fuze designs incorporated anti-removal booby traps. Unexploded mines found today are the result of a failure within the arming mechanism or procedure whereby the mine never fully armed. Sudden shock or jarring of a weapon in this state has the potential to complete the arming sequence and could result in the mine detonating with lethal consequences.

Non-Steel Cased Bombs. Used primarily in the construction of training or practice bombs, some high explosive variants were introduced towards the end of the war. With resources running scarce, German Engineers produced a small number of blast bombs with a concrete body. The design utilised a steel framework onto which concrete was cast. The explosive filling was also contained within a thin steel container within the bomb body. Very few “concrete” bombs were dropped on the UK. In common with standard steel cased weapons, this type of bomb can be detected using standard magnetometer detection techniques (albeit; providing a smaller ferromagnetic signature than its all steel counterparts). This type of bomb represents a very small percentage of the total number of bombs dropped worldwide and are not considered a significant threat, particularly when viewed from an overall bomb threat in the UK.

Anti-Personnel Bomb. Generally these were small weapons of 1-3 kilograms in weight and are often referred to as ‘Bomblets’ and possessing similar ground penetration ability as the Incendiary Bomblets. They were often located during the post-raid searches. This type of bomb has been recovered within the bomb rubble being cleared or used as in-fill on construction projects and poses the same potential to function as the Incendiary bomb with a greater potential to cause localised casualties.

Specialist Bomb. These types of bombs were designed to meet a specific mission requirement. Typically, this would be a design modification or special fusing to enable the bomb to destroy hardened/armoured targets or deep buried and sub-marine targets. Similar to the more common HE bombs, they differ in that they rarely contain large amounts of high explosive. Therefore the consequence of a detonation is reduced but remains a significant risk, particularly when the detonation occurs on or near the surface.

Depth Bombs & Depth Charges. These types of weapons were designed to meet a specific mission requirement. Typically, the modifications would include the type of explosive filling and special fusing to enable the bomb to penetrate to a significant depth into the ground or water before detonating. Depth bombs intended for maritime attack and sub-marine targets would be fitted with one or more fuzes, one of which would be a hydrostatic fuze designed to detonate the bomb at a predetermined depth. The bomb would be fitted with an anti skip ring to reduce the deflection of the bomb as it entered the water. Similar in many ways to Depth Bombs, Depth Charges were exclusively designed to detonate at a predetermined depth. This was achieved by fitting the Charge with a short time delay or hydrostatic fuze. Depth bombs; having a similar configuration to general purpose bombs had the potential to penetrate deeply into the sea bed where an attack occurred in the relatively shallower water of a dock.

Unmanned Rocket Bombs & Missiles. The most famous in this category of weapons were the V1 (Fi103 flying bomb) commonly known as the Doodlebug and the Larger V2 (A4 missile). Both V1 & V2 with high explosive warheads containing 850kg & 1000kg (respectively) represent some of the largest weapons to land in the United Kingdom. Both types were built in a similar manner to an aircraft and would generally disintegrate on impact even if the warhead failed to detonate. The impact would spread debris over a wide area which was difficult to miss and any resulting unexploded 'V' weapons were comprehensively dealt with at the time. For this reason they are rarely encountered on land. However, where a 'V' weapon landed in water the opportunity for the event to have been missed and/or follow-up action abandoned was greater and they continue to pose a significant risk. Other, less well known rocket bombs were also produced by the Luftwaffe to attack maritime targets. Some were equipped with TV/Radio guidance from the parent bomber. Two of the most common were the Fritz X which consisted of an adapted SD1400kg bomb and the Henschel Hs293 which was based on a smaller 500kg bomb. No record of one having been recovered on land as a UXB can be found but these large HE bombs are considered to pose a significant risk, particularly to maritime projects. No records were found to indicate this type of bomb was ever used on targets in the area.

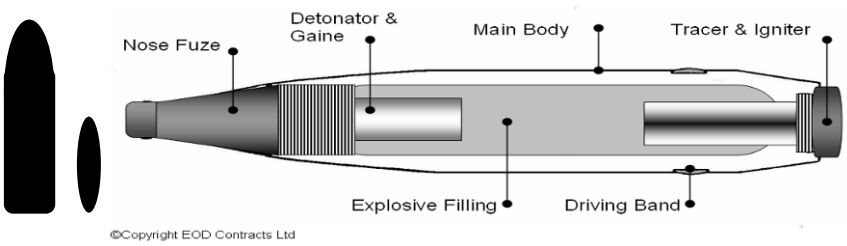
Photoflash Bomb. This type of bomb was dropped by specialist "Pathfinder" aircraft and although this type of bomb can be included with the category of specialist bombs, it is worthy of specific comment due to the danger it may still pose. Photoflash bombs were designed to explode with a blinding flash, rather like a camera flashbulb. They were used to enable photographs to be taken of targets at night and also served to identify ground targets for other aircraft to attack. The speed at which the highly energetic filling detonated, and energy it produced in doing so, was significant. Although these bombs were thin skinned and are prone to corrosion the functioning of one can be compared to a high explosive bomb detonation.

High Explosive Shells & Projectiles. As mentioned previously, one of the most common sources of UXO contamination encountered in the United Kingdom is High Explosive Shells and Projectiles. This is most commonly found to be as the result of firing practice ranges, bombardment and anti-aircraft defence, the latter often positioned to defend Major cities and Strategic installations and ports from German Bombing. Anti Aircraft Shells and projectiles are generally smaller (Up to 4.7" inch diameter) than the airdropped bombs and as a consequence were more easily missed amongst the bomb rubble. However, coastal bombardment guns could fire a shell weighing 1000kg, (larger than most common airdropped bombs) and capable of significant ground penetration. The generic layout of a projectile can be found at Figure 7. It should be noted that the fatal incident on the German autobahn in 2006 was thought to be the result of a shell or projectile detonating, not an airdropped bomb as first reported.

The Fuzes used in Anti-Aircraft Ammunition were designed to ensure the projectile would detonate in contact with the target, or at a pre-set altitude, or in close proximity to the target. The fuzes employed different means to achieve this, including; direct impact, or indirect impact, Barometric, Delay and Electro-magnetic influence. Some were fitted with more than one fuze, which served to reduce the chance of the projectile falling to earth and detonating. Artillery fuzes are activated during the firing process, using the projectile's acceleration or spin within the gun barrel to switch off the safety mechanisms. For this reason, fired projectiles are considered more dangerous than unfired ones.

Figure 7: Generic Shell Design

Scale & Graphic Cross Section of a typical High Explosive (HE) Shell



Approximate size of a large shell used by battleships and coastal bombardment guns (Left) and Anti-aircraft shell (Right)

Other Types of Ordnance.

The following additional sources of ordnance types have been considered, and inherent risks taken account of:

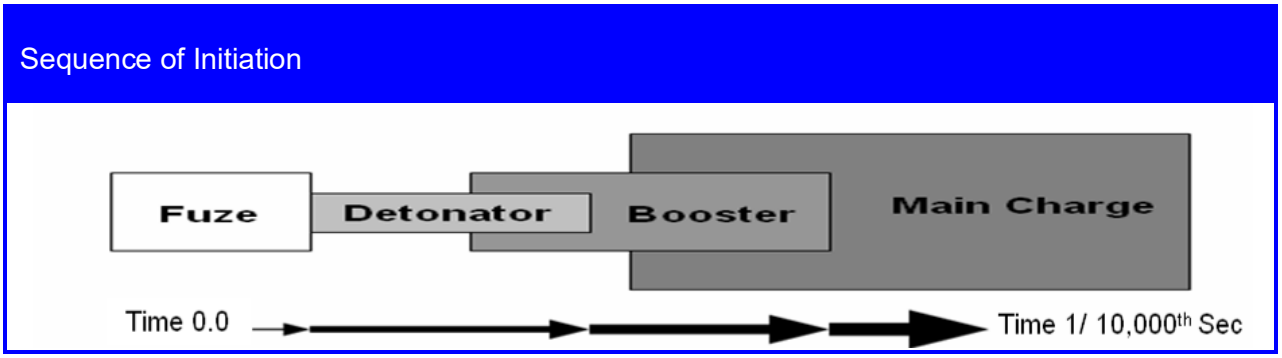
Flares and Pyrotechnics. Flares and pyrotechnics were used for a variety of reasons throughout the war and continue to be found today in the most unlikely places. However, due to the thin casings of these weapons a high level of corrosion is likely to have occurred since manufacture. Depending on the specific nature of the weapon, this effectively renders them inert with the exception of any white phosphorous content or explosive gaine.

Land Service Ammunition (LSA). While as the name implies this type of ammunition was designed for use on land, it was also issued to naval personnel for close protection of vessels and their crew and to provide a limited offensive capability even to relatively small craft. This type of ammunition includes some shells and projectiles such as those covered previously. Other natures of LSA range from Small Arms Ammunition (SAA), having little or no high explosive content to Grenades, Mortars and Rockets which may pose a risk of detonation due to their explosive content and the design of their fuzes (impact) which; if subjected to sufficient shock or friction may result in the weapon functioning. (See Figure 8)

Figure 8: Common Categories of Land Service Ammunition

Initiation of Unexploded Ordnance. Explosive Ordnance is highly unlikely to spontaneously explode. The energetic chemical compounds, (Explosives) used in weapon manufacture are chosen to be as stable as possible and they all require a significant application of additional energy to create the right conditions for detonation to occur. If stored correctly, most explosive materials are designed to remain stable for the duration of their expected lifespan (typically 20 years). During this time, the correct functioning of the weapon is achieved by means of the 'Initiation Train' (See Figure 9).

Figure 9: Explosive Ordnance Initiation Train.



Initiation Train. This is a means by which, once the safety features have been switched off or removed, a chain reaction occurs through the weapon. Starting within the fusing system as a small ignition or spark, causing a detonator to explode, which in turn causes the booster charge to detonate with a greater energy and ending in the full detonation of the main explosive filling. Each part of the process has in-built safety features to prevent an unintended detonation. A failure in any of the components within the Initiation Train can result in a UXO. In the case of a UXB; the chain reaction has broken down and the Initiation Train is brought to a halt, albeit, a temporary one. There are a number of ways that sufficient energy could be introduced to the otherwise stable UXB / UXO that may allow the Initiation Train to set off once more, overcoming the initial reason for failure. In addition to subjecting the weapon to excessive heat, such as a fire, the most common methods to bring about an explosive detonation in such items are considered to be:

Direct impact onto the main body of the bomb by mechanical excavation or pile driving: Such an occurrence can cause the bomb to detonate, should the point of impact be on the bomb fuze; less force would be required to bring about a full or partial explosive detonation.

Re-starting the clock timer in the bomb fuze. Only a small percentage of bombs were fitted with clockwork fuzes. It is likely that corrosion has taken place within the fuze that may prevent the clockwork mechanism from functioning. However, the restarting of the clock is by no means a scenario that can be completely ruled out. This is considered to be one of the two most credible mechanisms by which sufficient energy could be introduced to the bomb and result in a detonation.

Induction of a static charge or exposure to an external power source (Electrical Services), causing a current in an electrical fuze. The majority of German bombs employed an electrical component within the fuzes, it is likely that corrosion would have taken place within the fuze mechanism and that it would no longer contain, or conduct sufficient electrical charge to initiate the bomb.

Friction initiating the sensitive fuze explosive. Some chemical constituents may have deteriorated, due to oxidisation. Components designed with a high degree of stability at the time of manufacture may no longer be as safe. **This is considered to be the most likely mechanism by which sufficient energy could be introduced to the bomb and result in a detonation.**

Annex F

Risk Assessment Tables

Table 1: Summary of Potential Contamination Sources

Source	Applicable	Not Applicable
Enemy Attack & Counter Measures		
Bombing WW1		☒
Manned Aircraft Bombing WW2		☒
Unmanned V1 & V2 Rocket Attack		☒
Shelling		☒
Anti-Shipping Mines & Depth Charges		☒
Anti-Aircraft Shells & Rockets	☒	
Beach Mines & Coastal Defences.		☒
Airfield/Key Point Defensive Mines/Charges		☒
Abandoned Unexploded Bomb (A/UXB)		☒
Migration of UXO		
UXO Migration in Rubble & Infill		☒
UXO Migration by Tide & River Current		☒
UXO Migration by Marine Dredging		☒
Ship Wrecks		☒
Dispersal by Explosion, Fire & Accident		☒
Aeroplane Crash		☒
Private Collections		☒
MOD Facilities		
Bombing Range		☒
Artillery, Mortar & Tank Range		☒
Grenade Range		☒
Small Arms Firing Range		☒
Weapon Research & Development Facilities		☒
Ammunition Burial Grounds		☒
Docks & Harbour Facilities		☒
Offshore Ammunition Dumping Grounds		☒
Ammunition Storage & Manufacture Sites		☒
Airfields & Air Stations		☒
Bombing Decoy Site		☒
Army Barracks & Camps	☒	
MOD Training / Concentration Areas		☒
Home Guard & SOE Weapon Caches		☒

Table 2: Baseline Bomb Penetration Assessment

	Bomb Weights			
Sub Soil Type	50kg	250kg	500kg	1000kg
Soft Rock	2.442	5.016	6.006	7.062
Gravel	2.442	5.016	6.006	7.062
Sand	2.442	5.016	6.006	7.062
Chalk	3.7	7.6	9.1	10.7
Shingle	3.7	7.6	9.1	10.7
Dry Clay	**3.7**	**7.6**	**9.1**	**10.7**
Wet Sand	5.55	11.4	13.65	16.05
Wet Clay	5.55	11.4	13.65	16.05
Average Offset (m)	0.8-1.6	1.6-3.7	3-4.5	3.4-5.3

Table 3: Site Specific Bomb Penetration Assessment

Input Figures			
Bomb Weight	Release Height	Velocity on Impact	Angle of Strike
500 kg	5000 m	340 $m.s^{-1}$	10º to vertical

Geological Unit Description	Anticipated Thickness (m)	Anticipated Depth (m bgl)
Made Ground/Top Soil	0.6	0.6
Clay	10.5	11.1
Sand and Gravel (End of Log)	0.9	12

Output Figures	
Maximum Penetration Depth	Maximum Offset
11m	**5.3m**
The maximum threat depth from airdropped weapons is considered to be:	**Bombs 11m**
The maximum threat depth for smaller shells is considered to be:	**AA Shells 4m**

Input figures based on the most common bombing methods and largest common bomb type Figures derived from computer simulation. All depths based on 1939 levels.

Table 4: Airdropped Weapon Strike Indicators (UK)

Item	Increasing Potential level ⇨			
Site Location	**Rural**	Small Town	Brown Field Large Towns	Cities
Site Description and Use	**Greenfield or Agricultural Land**	Near Strategic Target	Adjacent to Strategic Target	Strategic Target
Site History	**No history of Attack**	Near area of Attack	Immediate Area Attacked	Direct Attack

Strategic Target: Military Installation, Industrial or Munitions Manufacturer, Power Station, Gas or Water Works, Port, Dock, Railway Yard, Decoy Site.

Table 5: Weapon Strike Records (UK)

Source	Availability			
Archive	**None**	Non specific	Specific	Extensive
In-house	**None**	Non specific	Specific	Extensive
Anecdotal	**None**	Non specific	Specific	Confirmed

Table 6: Anti-Aircraft Weapon Strike Indicators (UK)

Item	Increasing Potential level ⇨			
Site Location	**Rural**	Town	City	Military Site
Fixed Battery Location	None	General Area	Nearby	**Onsite**
Mobile Battery	**Rural**	Town	City	Military Site
Military Site: Airfield, Port, Radar, Barracks, Depots, Arsenal or Similar.				

Table 7: Abandoned Bomb Records (UK)

Item	Increasing Potential level ⇨		
In-house	**None**	Yes	On-site
Other	**None**	Yes	On-site

Table 8: Bomb Strike Density Assessment

Bombs & Mines	**Bomb density placed at VERY LOW.**

Table 9: Opportunity to have detected Bomb or Shell Strikes (UK)

Increasing Potential level ⇨
No recorded bombs or damage
Good ARP cover
Significant development
No significant ground cover
Light bombing or damage
Moderate ARP cover
Moderate development
Frequent public access
Little ground cover
Significant bombing or damage
Poor ARP cover
Minimal development limited to shallow excavations
Infrequent public access
Moderate ground cover
Heavy bombing or damage
No ARP cover
Development limited to site clearance
Controlled private access
Heavy ground cover, vegetation, ploughing or body of water

Table 10: Post Contamination Development Indicators (UK)

	Increasing Potential level ⇨
Nature of Post Contamination Development	100% excavations of the entire site to below contamination depth.
	Significant development
	Moderate development
	Minimal development
	No development

Table 11: Construction Activities Encounter Indicators

	Increasing Potential level ⇨
Activities	**Borehole Drilling**
	Dynamic Sampling
	Shallow Trial Pit
	Services Trenching
	Bored (CFA) Piling
	Sheet Piling
	Shallow Excavations over extended area
	Deep Excavations over a limited area
	High Density Piles
	Deep Excavations over extended area
	Bulk Excavations

Annex G

Source:	**The Sun**
Date:	**27th February 2021**
Description:	**A WORLD War II bomb** which sparked a mass evacuation in Exeter has been detonated by army experts leaving a crater the "size of a double decker bus." The noise from the huge blast - which sent debris flying more than 250 metres - could be heard five miles away with some residents claiming the aftershock rattled their windows. Personnel from the Army's Royal Logistics Corps took over from Royal Navy bomb disposal experts this morning. They used 400 tonnes of sand to create an enclosing "box" before it was "made safe" at around 6.10pm. He added: "Around 400-tonnes of sand was transported to the site of the device, which is at a building site on private land, and walls were erected... to mitigate the impact of the detonation. "Trenches were also dug to prevent ground shock. Despite these mitigation measures, the impact of the blast has been significant and debris has been thrown at least 250-metres away. "The crater is around the size of a double decker bus.

Source:	**UKNIP**
Date:	**04 May 2020**
Description:	Officers from Kent Police are working with Army Bomb Disposal officers after the discovery of two unexploded WW2 bombs were located in Kings Hill, Kent. Police were called just after 4:30pm Monday afternoon to Warwick Way after the discovery of an unexploded ordnance.The Army Bomb disposal service were called in to action to attend the scene to evaluate the discovery and make it safe. Shortly after a second ordnance was found in the adjacent road Gibson Drive. Officers have placed a cordon on the area whist the Army investigate and decide if a controlled explosion is needed.

Source:	**The Bolton News**
Date:	**10 February 2020**
Description:	A worker who found an unexploded bomb in a back garden has spoken about the discovery. Aram Mahmoud found the item while putting fence posts in for a house on Bradford Road, and said he recognised the explosive instantly due to growing up in Iraq. Mr Mahmoud said: "We were putting up concrete posts and we were digging and we found a rocket. "We called the police immediately and they came round. The bomb disposal team told Mr Mahmoud that the device was "very very dangerous". Bradford Road was closed between Green Lane and Bishops Road, and Oakleigh Avenue was also shut off with residents evacuated. Both roads have now reopened and the police have left the scene.

Source:	**Sky News**
Date:	**4 February 2020**
Description:	**London's Soho Evacuated as World War Two Bomb Discovered** A large part of central London's busy Soho area was evacuated after an unexploded Second World War bomb was found at a building site. Police were called at 1.42pm on Monday to Dean Street, connecting Oxford Street to Shaftesbury Avenue, which they cordoned off after the device was discovered near the Soho Hotel. A Royal Engineers bomb disposal unit was called in and removed the half-tonne device. The Metropolitan Police's Soho team said the cordons in Oxford Street, Charing Cross Road, Shaftesbury Avenue, Lexington Street and Poland Street had been lifted shortly after 8:30pm.

Source:	**Express and Star**
Date:	**May 17, 2019**
Description:	

Second World War Bomb Detonated in Bilston

A Second World War bomb was detonated by the army in Bilston last night following a discovery by a workman.

The detonation took place on what appeared to be a building site at around 8.30pm.

A West Midlands Police spokesman said: "We were called to reports of an unexploded World War 2 bomb at a building site on Coseley Road, Bilston, at 3.40pm. A controlled explosion was carried out."

Sip Grenades

Aftermath of Demolition

Source:	**The Beach** https://www.thebeach.co.uk/news/local-news/bomb-squad-called-after-dozens-of-second-world-war-grenades-discovered/
Date:	**28 May 2019**
Description:	Army bomb disposal teams have detonated 24 grenades found in a field in East Suffolk. The 'SIP grenades' - which stands for 'self-igniting phosphorus' - were discovered in the village of Sibton, which is near Yoxford, yesterday. The bombs, which were designed during the 1940s, were glass bottles filled with phoshorus and petrol. Unlike traditional Molotov cocktails, they would ignite spontaneously when the glass shattered, and the phosphorus became exposed to air. The grenades were issued to Home Guard units in the event of a German invasion; as that never happened crates of them have been left buried in unregistered hiding places.

Source:	**BBC News https://www.bbc.com/news/uk-england-hampshire-48327618**
Date:	**19 May 2019**
Description:	A suspected German wartime bomb which was caught in a fishing net off the coast of the Isle of Wight has been detonated. A fishing vessel reported picking up the 7ft-long sea mine, which was “most likely an old German wartime sea mine”, about a mile from the Needles at around 8am on Saturday, the Maritime and Coastguard Agency (MCA) said. Bomb disposal experts from the Royal Navy’s Portsmouth base were called in to detonate the device, while warnings were issued to ships and public in the area. Divers placed the mine back on the sea bed and blew up the bomb – found to contain 2,000lb of explosives – at 10.51am on Sunday, the Ministry of Defence said.

Source:	**Birmingham Live**
Date:	**25th March 2019**
Description:	Stechford Retail Park and homes evacuated after 'unexploded bomb' found Police have cordoned off the area at the Retail Park, off Flaxley Road, following reports an unexploded bomb. The discovery was made Stechford Retail Park just after midday. A number of homes have been evacuated along with part of the retail park. West Midlands Police say they believe it's from World War Two. A section of the A4040 closed, with bus routes also affected.

Source:	**The Guardian**
Date:	**3 March 2017**
Description:	A second world war bomb that forced schools and homes in London to be evacuated has been defused. The device, weighing 500lb (227kg), was found by builders working on a development in Brondesbury Park, north-west London, late on Thursday morning, on The Avenue, near the junction of Willesden Lane. The Metropolitan police, London fire brigade and an army bomb-disposal team were scrambled to the scene, where a cordon was erected and homes were evacuated.

Source:	**BBC**
Date:	**16th May 2017**
Description:	**Bomb disposal experts in Birmingham are taking part in a "major, delicate operation" to make a wartime bomb safe.** A major route into the city remains closed for a second day, rail services are affected and people have been evacuated from their homes. The bomb disposal team said 13 lorry loads of sand had been brought in to create a "sizeable igloo" around the 250kg (551lb) bomb. Junctions four to seven of the M6 have been closed ahead of detonation. West Midlands Police, who has praised the bravery of the team at the scene, said the motorway between junction four near Coleshill and seven at Great Barr will shut in both directions while a controlled explosion is carried out.

Environment Agency Provided Information

Permit with introductory note

Pollution Prevention and Control Regulations 2000
Landfill Regulations 2002

Rectory Farm Quarry
Mick George (Haulage) Limited
Rectory Farm Quarry
Titchmarsh Road
Thrapston
Northamptonshire
NN14 4NJ

Permit Number

BT9879

Contents

Introductory note

This introductory note does not form a part of the Permit

The following Permit is issued under Regulation 6 of the Landfill (England and Wales) Regulations 2002 (S.I.2002 No.1559) ("the Landfill Regulations") and Regulation 10 of the Pollution Prevention and Control (England and Wales) Regulations 2000 (S.I.2000 No.1973), as amended, ("the PPC Regulations") to operate *[part of]* an installation carrying out activities covered by the description in Section 5.2 A(1) (b) Schedule 1 of the PPC Regulations, to the extent authorised by the Permit:

(b) The disposal of waste in any other landfill to which the 2002 Regulations apply.

There may be some activities on the installation to which BAT applies because they are not Landfill activities. Therefore, in some sections of the Permit conditions require the Operator to use Best Available Techniques (BAT), in each of the aspects of the management of the installation, to prevent and where that is not practicable to reduce emissions. The conditions do not explain what is BAT. In determining BAT, the Operator should pay particular attention to the appropriate Horizontal guidance (H1 to H4) and other relevant guidance.

A non-technical description of the installation is given in the Application, but the main features of the installation are as follows:

Rectory Farm Quarry is a sand and gravel pit operated by Mick George (Haulage) Limited located around Grid Reference TL01467834 ,1.3km south-west of Titchmarsh and Polopit villages.The site is classified as a minor aquifer. The sand and gravel pit will be restored by the landfilling of inert waste. The site will be engineered inline with the Landfill Regulations (England and Wales) 2002.It is proposed that the site will be operational for five years with an importation rate of 75,000 tonnes of inert material per year. The total quantity of waste to be deposited in the landfill shall not exceed 303,000 m^3. The site has a Discharge Consent for site drainage.

Note that the Permit requires the submission of certain information to the Agency (see Sections 4 and 5). In addition, the Agency has the power to seek further information at any time under regulation 28 to the PPC Regulations provided that it acts reasonably.

Other PPC Permits /Consents relating to this installation		
Permit holder	Permit Number	Date of Issue
Mick George (Haulage) Ltd	PRNNF/12740 01 (Discharge consent)	8th July 2002

Superseded Licences/Authorisations/Consents relating to this installation			
Holder	Reference Number	Date of Issue	Status
Not applicable			

Other activities may take place on the site of this installation which are not regulated under this Permit or any other PPC Permit referred to in the Table above. These activities include: a discharge consent reference PRNNF/12740 01

Public Registers

Considerable information relating to Permits including the Application is available on public registers in accordance with the requirements of the PPC Regulations. Certain information may be withheld from public registers where it is commercially confidential or contrary to national security.

Variations to the Permit

This Permit may be varied in the future (by the Agency serving a Variation Notice on the Operator). If the Operator itself wants any of the Conditions of the Permit to be changed, it must submit a formal Application. The Status Log within the Introductory Note to any such Variation Notice will include summary details of this Permit, variations issued up to that point in time and state whether a consolidated version of the Permit has been issued.

Surrender of the Permit

Before this Permit can be wholly or partially surrendered, an Application to surrender the Permit has to be made by the Operator. For the application to be successful, the Operator must be able to demonstrate to the Agency that there is no pollution risk and that no further steps are required to return the site to a satisfactory state.

Transfer of the Permit or part of the Permit

Before the Permit can be wholly or partially transferred to another person, an Application to transfer the Permit has to be made jointly by the existing and proposed holders. A transfer will be allowed unless the Agency considers that the proposed holder will not be the person who will have control over the operation of the installation or will not comply with the conditions of the transferred Permit. As the Permit authorises the carrying out of a specified waste management activity, the transfer will only be allowed if the proposed holder is also considered to be “a fit and proper person” as required by the PPC Regulations.

Talking to us

Please quote the Permit Number if you contact the Agency about this Permit.

To give a Notification under condition 5.1.2, the Operator should use the Incident Hotline telephone number (0800 80 70 60) or any other number notified in writing to the Operator by the Agency for that purpose.

Status Log

Detail	Date	Comment
Application BT9879	Received 28/04/03	
Response to request for information	Request dated 29/08/03	Response dated 24/09/03
Letter	Dated 20/10/03	Response dated 23/10/03
		Response dated 27/10/03
		Response dated 31/10/03
		Response dated 21/11/03
Request to extend determination	Request dated 10/10/03	Request accepted 14/10/03
Request to extend determination	Request dated 05/12/03	Request accepted 08/12/03
Request to extend determination	Request dated 06/02/04	Request accepted 09/2/04
Request to extend determination	Request dated 05/03/04	Request accepted 08/03/04

Request to extend determination	Request dated 23/04/04	Request accepted 26/04/04
Request to extend determination	Request dated 13/05/04	Request accepted 20/05/04
Request to extend determination	Request dated 15/06/04	Request accepted 15/06/04
Permit determined	05/07/04	

End of introductory Note.

Permit

Pollution Prevention and Control Regulations 2000
Landfill Regulations 2002

Permit

Permit number

BT9879

The Environment Agency (the Agency) in exercise of its powers under Regulation 10 of the Pollution Prevention and Control (England and Wales) Regulations (SI 2000 No 1973), and Regulation 6 of the Landfill (England and Wales) Regulations (S.I.2002 No.1559) hereby authorises

Mick George (Haulage) Limited- (The Operator)

whose Registered Office is

Second Drove

Meadow Lane

St Ives

Cambridgeshire

PE17 4YQ

Company registration number 2417831

to operate an installation at

Rectory Farm Quarry

Titchmarsh Road

Thrapston

Northamptonshire, NN14 4NJ

to the extent authorised by and subject to the conditions of this Permit.

The landfill authorised by this Permit is for the disposal of inert waste

Signed	Date

[Karen Andrews- Team Leader Regulatory Waste]

Authorised to sign on behalf of the Agency

Conditions

1 General

1.1 Permitted Activities

1.1.1 The Operator is authorised to carry out the activities and/or the associated activities specified in Table 1.1.1.

Table 1.1.1 Permitted activities		
Activity listed in Schedule 1 of the PPC Regulations / Associated Activity	Description of specified activity	Limits of specified activity
Section 5.2 part A(1)(b), The disposal of waste in a landfill.P	Landfill for inert waste (landfill classification under the Landfill Regulations 2002)	eg Receipt, handling, storage and disposal of inert wastes, consisting of the types and quantities specified in condition s 2.1.2, 2.1.3 and 2.1.4 as an integral part of landfilling.
Water discharges to controlled waters	eg Discharge of site drainage from the landfill.	eg From surface water management system to point of entry to controlled waters

1.1.2 Where waste on site is subjected to activities that are exempt from control under the Waste Management Licensing Regulations 1994 then the wastes controlled under condition 1.1.1, above, shall be clearly identified and kept separate from such exempt waste activities and a record shall be kept of where such exempt activities are conducted.

1.2 Site

1.2.1 The activities authorised under condition 1.1.1 shall not extend beyond the Site, being the land shown edged in red on the Site Plan at Schedule 5 to this Permit.

1.3 Overarching Management Condition

1.3.1 Without prejudice to the other conditions of this Permit, the Operator shall implement and maintain a management system, organisational structure and allocate resources that are sufficient to achieve compliance with the limits and conditions of this Permit.

1.4 Improvement Programme

1.4.1 The Operator shall complete the improvements specified in Table 1.4.1 by the date specified in that table, and shall send written notification of the date of completion of each requirement to the Agency within 14 days of the completion of each such requirement.

Table 1.4.1: Improvement programme requirements		
Reference	Requirement	Date
1	A permitted installation closure plan shall be produced in consultation with the Agency and in accordance with council directive 1999/31/EC on the Landfill of Waste(26 April 1999). It shall specify the detailed procedure the operator proposes to implement upon the closure of the permitted landfill. The closure plan will be subject to approval by the Agency in writing and shall not be considered accepted or acceptable until such approval is given.	31st March 2009
2	A permitted installation post-closure aftercare and restoration plan shall be produced in consultation with the Agency in accordance with council directive 1999/31/EC on the landfill of waste (26 April 1999). It shall specify the detailed procedures the operator proposes to implement upon the permitted landfill being considered by the Agency to be in post closure and after care phase of its operations . The plan will be subject to approval by the Agency in writing and shall not be considered accepted or acceptable until such approval is given.	31st March 2009
3	A permitted installation decommissioning plan prior to surrender shall be produced in consultation with the Agency and in accordance with council directive 1999/31/EC on the landfill of waste (26 April 1999). It shall specify the detailed procedures the operator proposes to implement upon the Permitted installation being considered by the Agency to be suitable to decommission prior to surrender. The plan will be subject to approval by the Agency in writing and shall not be considered accepted or acceptable until such approval is given.	31st March 2009
4	Proposals for the location of the additional in waste boreholes for the monitoring of landfill gas to be retrofitted shall be submitted to the Agency and will be subjected to approval by the Agency in writing and shall not be considered accepted or acceptable until such approval is given	1 month after phase completion

1.4.2 Where the Operator fails to comply with any requirement by the date specified in Table 1.4.1 it shall send written notification of such failure to the Agency within 14 days of such date.

1.5 Minor Operational Changes

1.5.1 The Operator shall seek the Agency's written agreement to any minor operational changes under condition 2.1.1 of this Permit by sending to the Agency: written notice of the details of the proposed change including an assessment of its possible effects (including waste production) on risks to the environment from the Permitted Installation; any relevant supporting assessments and drawings; and the proposed implementation date.

1.5.2 Any such change shall not be implemented until agreed in writing by the Agency. As from the agreed implementation date, the Operator shall operate the Permitted Installation in accordance with that change, and relevant provisions in the Application shall be deemed to be amended.

1.5.3 When the qualification “unless otherwise agreed in writing” is used elsewhere in this Permit, the Operator shall seek such agreement by sending to the Agency written notice of the details of the proposed method(s) or techniques.

1.5.4 Any such method(s) or techniques shall not be implemented until agreed in writing by the Agency. As from the agreed implementation date, the Operator shall operate the Permitted Installation using that method or technique, and relevant provisions in the Application shall be deemed to be amended.

1.6 Pre-Operational Conditions

1.6.1 No disposal of wastes shall take place in any proposed new disposal areas of the Permitted Installation where waste deposit commences after the issue of this Permit unless:

1.6.1.1 At least 4 weeks prior to the commencement of construction of that area the Operator has submitted to the Agency in writing the detailed design and the construction quality assurance (CQA) Plan for the pre-operational engineering of the barriers for that area and that it is confirmed in writing by the Agency that these are in conformance with:

1.6.1.1.1 The relevant specifications set out in section 2 of Part B of the Application submitted in response to Question 0.1 of the schedule 4 notice dated 29/08/03; and

1.6.1.1.2 Where a period of 12 months or greater have lapsed since the issue of this permit the operator has also submitted:

- written justification that the relevant specifications set out in section 2 of Part B of the Application submitted in response to Question 0.1 of the schedule 4 notice dated 29/08/03 are still conformant with relevant guidance and any amending legislation; or
- a revised design and CQA Plan for any proposed phase or cell that takes into account subsequent revisions to relevant guidance and any amending legislation; and

1.6.1.2 any and all changes to the Construction Quality Assurance Plan, third party independent quality assurance, and detailed method statements have been notified in writing to the Agency and have not been implemented unless the Agency has given its written consent to those changes; and

1.6.1.3 the pre-operational engineering and infrastructure of the barriers have been completed and validated in accordance with the documented CQA procedures, and

1.6.1.4 the Operator has submitted the validation report in writing to the Agency; and

1.6.1.5 the Agency has inspected the area to ensure that it complies with the relevant conditions of the Permit, and has confirmed in writing that it has no objection to that area becoming operational.

1.7 Off-site Conditions

1.7.1 Surface water monitoring points SW1, SW2, discharge point, SW3 and landfill gas and groundwater monitoring point GW3 shall be maintained and monitored in accordance with condition 2.10.

2 Operating conditions

2.1 Landfilling Controls

2.1.1 The Permitted Installation shall, subject to the conditions of this Permit, be operated using the techniques and in the manner described in the documentation specified in Table 2.1.1A, or as otherwise agreed in writing by the Agency in accordance with conditions 1.5.1 and 1.5.2 of this Permit.

Table 2.1.1A: Operating techniques

Description	Parts	Date Received
Application	The response to questions 1.1-1.3, 2.1-2.12 in part B of the application form version 2 November 2000 and given in Volume I, II III and IV of the application (excluding the response to questions 1.1-1.3, 2.1-2.12 in part B of the application form version 2 November 2000 and given in Volume I,II,III and IV of the application)	28/04/2003
Response to letter dated 29/08/03	The response to letter dated 29/08/03 is given in letter dated 24/09/03 REF: DW-T2/4	24/09/2003
Response to schedule 4 Notice dated 29/08/2003	Response to questions 0.1 , 1.1.1-1.1.5, 1.1.10-1.1.15, 1.1.27-1.1.32, 1.2.28-1.2.29, 2.1.1, 2.2.1, 2.2.6, 2.2.8, 2.3.16, 2.3.34, 2.3.42, 2.3.48, 2.3.63, 2.3.67-2.3.68, 2.3.70-2.3.71, 2.3.85, 2.4.1, 2.4.4, 4.1.1-4.1.2, 4.3.4, of the schedule 4 notice dated 29/08/2003 given in appendices 1-24 and volumes I - V replaces questions1.1- 1.3 and 2.1- 2.12 in part B of the application form version 2 November 2000 and with supporting information given in Volume I , II, III and IV .	24/09/2003
Response to letter dated 20/10/2003	The response to question 1.1.1 of the letter dated 20/10/03 ref: BT9879 given in plan reference number RF/REC/01a dated Oct 2003 replaces plan reference RF/SR/01 given in response to question 1.1.1 of the schedule 4 notice dated Sept 2003	23/10/2003
Response to letter dated 20/10/2003	Response to question 1.1.27 and 1.1.30 of the letter dated 20/10/03 ref:BT9879 given in plans referenced RF/GEO/02c Oct 2003 and RF/SR/06a Oct 2003 replaces Plans reference RF/SR/06 dated Sept 03 and RF/GEO/02a dated Sept 2003 in response to questions 1.1.27 and 1.1.30 of the schedule 4 notice dated 29/08/03	23/10/2003
Response to letter dated 20/10/2003	Response to question 1.1.31 of the letter dated 20/10/2003 ref:BT9879 given in letter dated 23/10/2003 ref:DW/SB-T2/4 supplements the response to question 1.1.31 of the schedule 4 notice dated 29/08/03 given in appendix 12 .	23/10/2003
Response to the letter dated 20/10/2003	Response to question 2.4.1 of the letter dated 20/10/2003 given in amended Appendix F of appendix 23 replaces the response to the schedule 4 notice dated 29/08/03 given in appendix F of appendix 23.	23/10/2003

Response to letter dated 20/10/2003	Response to questions 2.2.1 and 2.2.8 of the letter dated 20/10/2003 given in the document entitled Rectory Farm Waste Acceptance Criteria and Procedures-Rev A dated Oct 2003 replaces the response to questions 2.2.1 and 2.2.8 of the schedule 4 notice dated 29/08/03 given in appendix 14	27/10/2003
Response to letter dated 20/10/2003	Response to question 2.3.34 of the letter dated 20/10/2003 given in the letter dated 27/10/2003 REF: DW/JB-T2/4 supplements the response to question 2.3.34 of the schedule 4 notice dated 29/08/03.	27/10/2003
Response to letter dated 20/10/2003	Response to question 2.3.48 of the letter dated 20/10/2003 given in Gas Monitoring Action Plan Rev A dated Oct 2003 and the amended questions 2.3.48 and 2.3.49 of Part B of the application form replaces the response given to question 2.3.48 of the schedule 4 notice dated 29/08/03 and questions 2.3.48 and 2.3.49 of Part B of the application form submitted in response to question 0.1 of the schedule 4 notice dated 29/08/03	27/10/2003
Response to letter dated 20/10/2003	Response to question 2.4.1 of the letter dated 20/10/2003 given in the letter dated 27/10/03 Ref:DW/JB-T2/4 replaces the response given to question 2.4.1 of the schedule 4 notice dated 29/08/03 in question 2.4.1 of part B of the application form submitted in response to question 0.1 of the schedule 4 notice dated 29/08/03.	27/10/2003
Response to letter dated 20/10/2003	Response to question 1.1.12 of the letter dated 20/10/2003 given in the letter dated 31/10/2003 REF: DW/JB-T2/4 in section 1. Question 2.1.12 supplements the response given to question 1.1.12 of the schedule 4 notice dated 29/08/03 given in appendix 24	31/10/2003
Schedule 4 notice dated 29/08/2003	Response to question 1.1.31 of the schedule 4 notice dated 29/08/2003 given in the letter dated 21/11/03 REF: DW/JB-T2/4 supplements the response given to question 1.1.31 of the schedule 4 notice dated 29/08/03 given in appendix 12	21/11/2003
E-mail from Dan Walker Marwalk Developments Limited dated 01/03/04 ref:DW-T2/4	Information in e-mail supplements information contained in appendix 15 of the schedule 4 notice response dated 29/08/03	01/03/2004
E-mail from Dan Walker Marwalk Developments Limited dated 08/04/04	Information in e-mail on groundwater monitoring suite supplements information contained in the schedule 4 notice response dated 29/08/03	08/04/04

2.1.2 Wastes shall only be accepted for disposal on the site if they are both as described in the application in the document entitled Rectory Farm, Thrapston, Northamptonshire Waste Criteria and Acceptance Procedures (Rev A) Oct 2003 in response to Question 2.2.8 of the letter dated 20/10/03 REF: BT9879 and in accordance with the restrictions in Table 2.1.1B:

Table 2.1..1B : Wastes accepted for disposal	
Waste Category or Type	New Landfill
	Permitted or not Permitted
Hazardous	Not Permitted
Non-hazardous	Not Permitted
Inert	Permitted Excluding top soil and peat waste
Liquid wastes (including waste waters but excluding sludge).	Not permitted
Waste which in the conditions of landfill is explosive, corrosive, oxidising, highly flammable or flammable.	Not permitted
Hospital and other clinical infectious wastes from medical or veterinary establishments.	Not permitted
Chemical substances from research and development or teaching activities, for example laboratory residues, which are unidentified and/or which are new and whose effects on man and/or the environment are unknown.	Not permitted
Whole used tyres (other than tyres used as engineering materials, bicycle tyres and tyres with an outside diameter of more than 1400mm.)	Not permitted
Shredded used tyres (other than bicycle tyres and tyres with an outside diameter of more than 1400mm.)	Not permitted
Any waste which does not fulfil the relevant waste acceptance criteria.	Not permitted
Waste which has been diluted or mixed solely to meet the relevant waste acceptance criteria.	Not permitted

Wastes which have not been treated, except for: inert wastes for which treatment is not technically feasible; or it is waste other than inert waste and treatment would not reduce its quantity or the hazards which it poses to human health or the environment.	Not Permitted

2.1.2.1 the Operator of the landfill shall visually inspect the waste at the entrance to the landfill and at the point of the deposit and shall satisfy himself that it conforms to the description provided in the documentation submitted by the holder; and

2.1.2.2 the Operator shall ensure that if representative samples are taken for analysis, the operator shall reference and retain the samples and results of any analysis for at least one month; and

2.1.2.3 the Operator on accepting each delivery of waste shall provide a written receipt to the person delivering it; and

2.1.2.4 the Operator shall ensure that the landfill is secured to prevent free access to the site and the gates of the landfill must be locked outside operating hours.

2.1.3 The total quantity of waste that shall be deposited in the landfill shall not exceed 303,000 m^3.

2.1.4 The quantity of waste that is deposited in the landfill in any year shall not exceed the limits in Table 2.1.2 below.

Table 2.1.2 : Annual Waste Input Limits

Category	Limit Tonnes/ Year	Comments
Inert Waste	75,000	
Total Quantity per annum	75,000	

2.1.5 The Operator shall maintain and implement a system which ensures that a record is made of the quantity, characteristics, origin, date of delivery, the identity of the producer (or in the case of municipal waste, the collector) of any waste that is received for disposal or recovery at the Permitted Installation.

2.1.6 The Operator shall record the quantity of waste deposited within the landfill.

2.2 Emissions

2.2.1 Emissions to Air (excluding Odour, Noise or Vibration) from specified points

2.2.1.1 This Part 2.2.1 of this Permit shall not apply to releases of odour, noise or vibration.

2.2.1.2 There are no specific controls imposed upon emissions to air in Part 2.2.1 of this Permit. Controls on such emissions are included in Parts 2.2.6 and 2.10.4.

Air (Point Source) Monitoring

2.2.2 No condition applies

2.2.2.1 No condition applies

2.2.3 Emissions to water (other than groundwater), from specified points

2.2.3.1 This Part 2.2.3 of the Permit shall not apply to releases of odour, noise or vibration or to releases to groundwater.

Emissions to Water (other than to Sewer)

2.2.3.2 Condition 2.2.3.2 shall not apply to emissions to sewer.

2.2.3.3 No emission from the Permitted Installation shall be made to water

except via emissions to water from the emission point specified in Table 2.2.2 shall only arise from the source specified in that Table

Table 2.2.2: Emission point to water

Emission Point Reference and/or location description	Source	Receiving Water
Proposed water discharge Point (consent number PRNNF/12740 01) located on drawing number RF/SR/06a as Proposed water discharge point	Site drainage from site	Tributary of Polopit Brook

Emissions to sewer

2.2.3.4 There are no specific controls imposed on emissions to sewer in this Part of the Permit. Controls on such emissions are included in Parts 2.2.9.

Water (emissions to sewer) monitoring

2.2.4 No condition applies.

2.2.4.1 No condition applies.

2.2.4.2 No condition applies.

2.2.4.3 No condition applies

2.2.5 Emissions to groundwater

2.2.5.1 No emission from the Permitted Installation shall give rise to the introduction into groundwater of any substance in List I (as defined in the Groundwater Regulations 1998 (S.I. 1998 No. 2746)).

2.2.5.2 No emission from within the Permitted Installation shall give rise to the introduction into groundwater of any substance in List II (as defined in the Groundwater Regulations 1998 (S.I. 1998 No. 2746)) so as to cause pollution (as defined in the Groundwater Regulations 1998 (S.I. 1998 No. 2746)).

2.2.5.3 For substances other than those in List I or II (as defined in the Groundwater Regulations 1998 (SI 1998 No.2746)), the Operator shall ensure that all appropriate measures are taken to prevent, or where that is not practicable, to reduce, emissions to groundwater from the Permitted Installation provided always that the techniques used by the Operator shall be no less effective than those described in the Application, where relevant.

2.2.5.4 Subject to the terms of this condition, the activities of disposal, or tipping for the purpose of disposal, of waste, that are authorised by this landfill permit shall cease 3½ years from the date of issue of this Permit, unless by that date the operator has submitted to the Agency a written review of the Hydrogeological Risk Assessment submitted as part of the original Application for the permit.

The Risk Assessment review shall include a review of the responses in Section 1.2.1 to 1.2.10 of Part B of the application submitted in response to Question 0.1 of the schedule 4 notice dated 29/08/03. The written review shall show that the specified date, the level of risk to groundwater meets the terms of the Groundwater Regulations 1998.

Within six months of receipt of the written review the Agency shall reply in writing to the operator either confirming that the above requirements have been met and authorising continuation of disposal activities or that activities of disposal or tipping for the purpose of disposal of waste authorised by this permit shall cease until the operator can show that, the level of risk to groundwater meets the terms of the Groundwater Regulations 1998.

In the event that the continuation of activities is authorised in accordance with this condition beyond 4 years following the date of granting of this Permit, they shall cease on every fourth anniversary thereafter, unless, by each of those dates, the operator has submitted to the Agency a further written review of the Hydrogeological Risk Assessment which shows that, at the specified dates, the level of risk to groundwater meets the terms of the Groundwater Regulations .

The reviews submitted to the Agency shall include the results of any investigations and reviews carried out, and, in particular, reviews of the following aspects of the Hydrogeological Risk Assessment.

- Recommendations of the essential technical precautions which must be taken, paying particular attention to the nature and concentration of the substances present in the matter being disposed of or tipped, the characteristics of the receiving environment and the proximity of the water catchment areas, in particular those for drinking, thermal and mineral water;
- Recommendations of the technical precautions necessary:
  - i In the case where groundwater is considered to be permanently unsuitable for other uses, to ensure that no substance in list I can reach other aquatic ecosystems or harm other ecosystems, to ensure that the presence of any list I substance once discharged into the groundwater will not impede exploitation of ground resources and to prevent pollution of groundwater by list II substances; and
  - ii in the case where groundwater is not considered to be permanently unsuitable for other uses, to prevent any discharges into groundwater of substances in list I and to prevent any pollution of groundwater by substances in list II.

2.2.6 Fugitive emissions of substances to air

2.2.6.1 The Operator shall ensure that all appropriate measures are taken to prevent or where that is not practicable to reduce fugitive emissions of substances to air from the Permitted Installation in particular from:

- storage areas
- buildings
- pipes, valves and other transfer systems
- unfilled, operational and filled landfill surfaces;

provided always that the techniques used by the Operator shall be no less effective than those described in the Application, where relevant.

2.2.6.2 The Operator shall use all appropriate measures so as to prevent, or where that is not practicable, to reduce, emissions of litter from the Permitted Installation provided always that the techniques used by the Operator shall be no less effective than those described in the Application, where relevant.

Air (fugitive emissions) Monitoring

2.2.7 No condition applies

2.2.7.1 No condition applies

Aerial emissions of particulate matter

2.2.8 There are no specific controls imposed on fugitive emissions to air in Part 2.2.8 of this Permit. Controls on such emissions are included in Part 2.2.6.

2.2.8.1 No Condition Applies

2.2.9 Fugitive emissions of substances to water and sewer

2.2.9.1 Subject to condition 2.2.9.2 below, the Operator shall ensure that all appropriate measures are taken to prevent or where that is not practicable to reduce fugitive emissions of substances to water (other than Groundwater) and sewer from the Permitted Installation in particular from:

- all structures under or over ground
- surfacing
- bunding
- storage areas

provided always that the techniques used by the Operator shall be no less effective than those described in the Application, where relevant.

2.2.9.2 There shall be no release to water that would cause a breach of an EQS established by the UK Government to implement the Dangerous Substances Directive 76/464/EEC.

2.2.10 Odour

2.2.10.1 The Operator shall ensure that all appropriate measures are taken to prevent, or where that is not practicable, to reduce, odorous emissions from the Permitted Installation, in particular by:

- limiting the deposit and use of odorous materials
- restricting odorous activities (e.g. Excavation of deposited waste)
- controlling the storage conditions of odorous materials (e.g. Sheeting of vehicles, compaction and coverage of waste)
- timely monitoring, inspection and maintenance (e.g. increase planned maintenance, increase routine inspection by operator)
- employing, where appropriate, an approved odour management plan (e.g. Effect repairs, upgrade system, regular reviews of management plan)

provided always that the techniques used by the Operator shall be no less effective than those described in the Application, where relevant.

2.2.10.2 No condition applies

2.2.11 Emissions to Land

2.2.11.1 This Part 2.2.11 of this Permit shall not apply to emissions to groundwater.

2.2.11.2 No emission from the Permitted installation shall be made to land.

2.2.11.3 Subject to the other conditions of this Permit, there shall be no other emissions to land from the Permitted Installation.

2.2.11.4 The Operator shall notify the Agency, as soon as reasonably practicable, of any information concerning the state of the Site which affects or updates that provided to the Agency as part of the Site Report submitted with the application for this Permit.

2.3 Management and Fit and Proper Person for Specified Waste Management Activities (SWMAs).

2.3.1 A copy of this Permit and those parts of the application referred to in this Permit shall be available, at all times, for reference by all staff carrying out work subject to the requirements of the Permit.

Training

2.3.2 The Permitted Installation shall be supervised by staff who are suitably trained and fully conversant with the requirements of this Permit.

2.3.3 All staff shall be fully conversant with those aspects of the Permit conditions that are relevant to their duties and shall be provided with adequate professional technical development and training and written operating instructions to enable them to carry out their duties.

2.3.4 The Operator shall maintain a record of the skills and training requirements for all staff whose tasks in relation to the Permitted Installation may have an impact on the environment and shall keep records of all relevant training.

Maintenance

2.3.5 All plant and equipment used in operating the Permitted Installation, the failure of which could lead to an adverse impact on the environment, shall be maintained in good operating condition.

2.3.6 The Operator shall maintain a record of relevant plant and equipment covered by condition 2.3.5 and for such plant and equipment:

2.3.6.1 a written or electronic maintenance programme; and

2.3.6.2 records of its maintenance.

Incidents and Complaints

2.3.7 The Operator shall maintain and implement written procedures for:

2.3.7.1 taking prompt remedial action, investigating and reporting actual or potential non-compliance with operating procedures or emission limits and if such event occur;

2.3.7.2 investigating incidents, (including any malfunction, breakdown or failure of plant, equipment or techniques, down time, any short term and long term remedial measures and near misses) and prompt implementation of appropriate actions; and

2.3.7.3 ensuring that detailed records are made of all such actions and investigations.

2.3.8 The Operator shall record and investigate complaints concerning the Permitted Installation's effects or alleged effects on the environment. The record shall give the date and nature of complaint, time of complaint, name of complainant (if given), a summary of any investigation and the results of such investigation and any actions taken.

Fit and Proper Person

2.3.9 Where Regulation 4 of the Regulations applies to a relevant activity/associated activity carried on at the Permitted Installation, as authorised under condition 1.1.1:

2.3.9.1 any changes in technically competent management and the name of any incoming person together with evidence that such person has the required technical competence shall be submitted to the Agency in writing within 5 working days of the change in management. Technically competent management and technical competence shall be as prescribed under Section 74 of the Environmental Protection Act 1990;

2.3.9.2 in the event of the Operator and/or any relevant person being convicted of any relevant offence and which is in addition to any already notified to the Agency, then full details shall be provided to the Agency within 14 days of conviction, whether or not the conviction is subsequently appealed. Such details shall include , in respect of each relevant person (as defined in section 74(7) of the Environmental Protection Act 1990 or any subsequent amendments to that section), the nature of the offence, the place and date of conviction, any sentence, and any fine or other penalty imposed;

2.3.9.3 in the event that the Operator and/or any relevant person lodges an appeal against any such conviction, the Operator shall notify the Agency of this within 14 days of the lodging. The Operator shall notify the Agency of the results of that appeal, within 14 days of the appeal being decided; and

2.3.9.4 the financial provision for meeting the obligations under this Permit set out in the Agreement made between the Operator and the Agency dated 5th July 2004 shall be maintained by the Operator throughout the subsistence of this Permit and the Operator shall produce evidence of such provision whenever required by the Agency.

2.3.10 The operator shall ensure that the charges it makes for the disposal of waste in the landfill covers all of the following:

i) the costs of setting up and operating the landfill;
ii) the costs of the financial provision required by condition 2.3.9.4; and
iii) the estimated costs for the closure and after-care of the landfill site for a period of at least 30 years from its closure.

2.4 Efficient use of raw materials

2.4.1 The Operator shall:

2.4.1.1 maintain the raw materials table or description submitted in response to Section 2.4 of Part B of the Application form submitted in response to Question 0.1 of the schedule 4 notice dated 29/08/03 and in particular consider on a periodic basis whether there are suitable alternative materials to reduce environmental impact;

2.4.1.2 carry out periodic waste minimisation audits and water use efficiency audits. If such an audit has not been carried out in the 2 years prior to the issue of this Permit, then the first such audit shall take place within 2 years of its issue. The methodology used and an action plan for increasing the efficiency of the use of raw materials or water shall be submitted to the Agency within 2 months of completion of each such audit and a review of the audit and a description of progress made against the action plan shall be submitted to the Agency at least every 4 years thereafter; and

2.4.1.3 ensure that incoming water use is directly measured and recorded.

2.5 Waste Storage and Handling

2.5.1 No condition applies except as covered by the requirements in 2.1.1

2.6 Waste recovery or disposal

2.6.1 Waste produced at the Permitted Installation shall be recycled or recovered unless technically and/or economically impossible.

2.6.2 The Operator shall maintain and implement a system which ensures that a record is made of the quantity, composition, origin, destination (including whether this is a recovery or disposal operation) and where relevant removal date of any waste that is produced at the Permitted Installation.

2.7 Energy Efficiency

2.7.1 No condition applies

2.7.2 No condition applies

2.7.3 No condition applies

2.8 Accident prevention and control

2.8.1 The Operator shall maintain and implement when necessary the accident management plan submitted or described in response to Section 2.4.4 of Part B of the Application Form submitted in response to Question 0.1 of the schedule 4 notice dated 29/08/03. The plan shall be reviewed at least every 2 years or as soon as practicable after an accident, whichever is the earlier, and the Agency notified of the results of the review within 2 months of its completion.

2.9 Noise and Vibration

2.9.1 The Permitted Installation shall be designed, operated and maintained so as to avoid reasonable cause for annoyance from noise or vibration, in particular by:

- equipment maintenance e.g. fans, pumps, generators and mobile plant;
- use and maintenance of appropriate attenuation e.g. silencers, barriers, enclosures;
- timing and location of noisy activities and vehicle movements;
- periodic checking of noise emissions, either qualitatively or quantitatively; and
- maintenance of roads and building fabric.

Provided always that the techniques used by the operator shall be no less effective than those described in the application, where relevant

2.9.2 No condition applies

2.9.3 No Condition applies.

2.10 On Site Monitoring

2.10.1 The Operator shall maintain and implement an emissions monitoring programme which ensures that emissions are monitored from the specified points, for the parameters listed in and to the frequencies and methods described in Tables 2.10.2A, 2.10.2B, 2.10.3A, 2.10.3B, 2.10.4A, 2.10.4B, unless otherwise agreed in writing, and that the results of such monitoring are assessed. The programme shall ensure that monitoring is carried out under an appropriate range of operating conditions.

Water (other than to sewer) monitoring

2.10.2 The Operator shall carry out surface water monitoring of the parameters listed in Appendix A and Table 2.10.2A, at the specified monitoring points and at least at the frequencies specified in that Table.

2.10.2.1 The compliance limit for emissions to water for the parameter(s) and monitoring point(s) set out in Table 2.10.2A shall not be exceeded.

Table 2.10.2A : Assessment criterion for surface water quality				
	Parameters (Locations of monitoring points located on Site Surface Water Management Plan Ref:RF/SR/06a)	SW1	SW2	SW3
Measurement:				
Ammoniacal nitrogen (amm-N)	mg/l N	Quarterly	Quarterly	Quarterly
Ph	Ph	Quarterly	Quarterly	Quarterly
Suspended solids	mg/l	Quarterly	Quarterly	Quarterly
Visible Oil	Visual check	Monthly	Monthly	Monthly
Frequency:	Monthly(Visible Oil), Quarterly (the rest)			
Monitoring points:	Discharge point	SW1	SW2	SW3
Compliance limit:	Amm-N : < 1 mg/l	None set	<1mg/l	None set
	Ph : <9 and > 6	None set	<9 and >6	None set
	Suspended solids : < 40 mg/l	None set	<40mg/l	None Set
	Visible Oil : None visible and see table 2.10.2B below	None set	None visible	None set
Assessment limit:	Amm-N : <1mg/l	None set	<1mg/l	None set
	Ph : <9 and >6	None set	<9 and >6	None set
	Suspended Solids: <40 mg/l	None set	<40mg/l	None set
	Visible Oil: None visible	None set	None Visible	None set
Assessment test:	Amm-N concentration exceeds assessment limit on any three occasions in a 6 month period	None set	Amm-N concentration exceeds assessment limit on any three occasions in a 6 month period	None set
	Ph assessment limit is exceeded on any three occasions in a 6 month period	None set	Ph assessment limit is exceeded on any three occasions in a 6 month period	None set
	Suspended Solids assessment limit is exceeded on any three occasions in a 6 month period	None set	Suspended Solids assessment limit is exceeded on any three occasions in a 6 month period	None set
	Visible Oil assessment limit is exceeded on any three occasions in a 6 month period	None set	Visible Oil assessment limit is exceeded on any three occasions in a 6 month period	None set

2.10.2.2 The compliance limits for the emissions to water for the parameter(s) and emission point(s) set out in Table 2.10.2B shall not be exceeded.

Table 2.10. 2B : Emission limits to water and monitoring			
Emission point	Parameter	Limit (including Reference Period)	Monitoring frequency
Proposed discharge point	Ph	< 9 and > 6	Quarterly
	Suspended solids	< 40mg/l	Quarterly
	Visible Oil	None visible	Monthly
	Ammonia	< 1mg/l	Quarterly
SW1	Ph	None set	Quarterly
	Suspended solids	None set	Quarterly
	Visible Oil	None set	Monthly
	Ammonia	None set	Quarterly
SW2	Ph	< 9 and > 6	Quarterly
	Suspended solids	< 40mg/l	Quarterly
	Visible Oil	None visible	Monthly
	Ammonia	< 1mg/l	Quarterly
SW3	Ph	None Set	Quarterly
	Suspended Solids	None Set	Quarterly
	Visible Oil	None set	Monthly
	Ammonia	None set	Quarterly
Lagoons	Ph	None Set	Annually
	Suspended Solids	None Set	Annually
	Visible Oil	None set	Annually
	Ammonia	None set	Annually
Water Storage area	Ph	None Set	Annually
	Suspended Solids	None Set	Annually
	Visible Oil	None set	Annually
	Ammonia	None set	Annually

2.10.2.3 Where a substance is specified in Table 2.10.2A and 2.10.2B but no limit is set for it, the concentration of such substance in emissions to water from the relevant emission point shall be no greater than the background concentration

Groundwater monitoring

2.10.3 The Operator shall carry out groundwater monitoring of the parameters listed in Appendix A and Table 2.10.3A at the specified monitoring points and at least at the frequencies specified in that Table.

Table 2.10.3 A: Emissions into groundwater				
Parameters	Frequency	Monitoring Points (located on drawing number RF/GEO/02c dated Oct 2003)		
		GW1	GW2	GW3
Cadmium (ug/l)	Quarterly	None set	0.1	0.1
Chloride (mg/l)	Quarterly	None Set	250	250
Ammonia (mg/l)	Quarterly	None Set	1	1
Nickel(ug/l)	Quarterly	None Set	20	20

2.10.3.1 The compliance limit for emissions to land for the parameter(s) and monitoring point(s) set out in Table 2.10.3 B shall not be exceeded.

Table 2.10.3B : Assessment criterion for groundwater quality	
	Parameters
Measurement: Cadmium (ug/l) Chloride (mg/l) Ammonia (mg/l) Nickel (mg/l)	
Frequency:	Quarterly
Monitoring points:	Boreholes GW2 and GW3
Trigger level:	Cadmium 0.1 ug/l Chloride 250 mg/l Ammonia 1mg/l Nickel 20ug/l
Control level:	Cadmium N/A Chloride 200 mg/l Ammonia 1mg/l Nickel 20 ug/l
Assessment test:	Concentration exceeds control limit on three consecutive routine surveys actions specified in the monitoring plan .

Landfill Gas Monitoring

2.10.4 The Operator shall carry out monitoring of the parameters listed in Table 2.10.4A, from the monitoring points and at least at the frequencies specified in that Table.

Table 2.10.4A : Landfill Gas Monitoring			
Parameters	Monitoring equipment type	Frequency of monitoring Monitoring Points	
		GW1, GW2 and GW3 as located on drawing number RF/GEO/02C dated Oct 2003. Additional monitoring boreholes to be agreed with the Agency as per improvement condition 4	
Oxygen	Infra red Analyser		Quarterly
Carbon Dioxide	Infra Red Analyser		Quarterly
Methane	Infra Red Analyser		*Quarterly
Atmospheric pressure	Barometer		Quarterly
Temperature	Thermometer		Quarterly
Weather Conditions			Quarterly

***** Monitoring shall only take place under calm conditions (< Beaufort force 3). Monitoring equipment can be changed with agreement of the Environment Agency

2.10.4.1 The trigger levels limits for landfill gas monitoring for the parameter(s)[1] and monitoring point(s) set out in Table 2.10.4B shall not be exceeded.

Table 2.10.4B : Trigger Levels for Landfill Gas Monitoring			
Monitoring points	Parameters	Units/Accuracy	Trigger Level
External gas monitoring boreholes GW1, GW2 and GW3 located on drawing number RF/GEO/02C dated Oct 2003	Methane	% v/v, 0.1%	> 1.0%
	Carbon Dioxide	% v/v, 0.1%	> 1.5%
	Oxygen	% v/v, 0.1%	< 18.0%
Additional monitoring points to be agreed by the Agency see improvement condition 4			

[1] The environmental trigger levels for other chemicals are listed in EA guidance document H1 shall be not be exceeded at the site boundary.

Leachate Monitoring

2.10.5 There are no specific controls imposed on leachate in Part 2.10.5 of this Permit

2.10.5.1 No condition applies

2.10.5.2 No condition applies

2.10.5.3 No condition applies

Noise Monitoring

2.10.6 No condition applies

General

2.10.7 The Operator shall notify the Agency at least 14 days in advance of undertaking monitoring and/ or spot sampling, where such notification has been requested in writing by the Agency.

2.10.8 The Operator shall maintain records of all monitoring taken or carried out (this includes records of the taking and analysis of samples instrument measurements (periodic and continual), calibrations, examinations, tests and surveys) and any assessment or evaluation made on the basis of such data.

2.10.9 There shall be provided:

2.10.9.1 safe and permanent means of access to enable sampling/monitoring to be carried out in relation to the emission points specified in Schedule 2 to this Permit, unless otherwise specified in that Schedule; and

2.10.9.2 safe means of access to other sampling/monitoring points when required by the Agency.

2.11 Closure, Aftercare and Decommissioning

2.11.1 The Permitted Installation shall, subject to the conditions of this Permit, be managed and controlled as described in the documentation specified in Table 2.11.1, or as otherwise agreed in writing by the Agency.

Table 2.11.1: Closure, Aftercare and Decommissioning techniques

Description	Parts	Date Received
Application	The response to questions 2.11 In Part B of the application form version 2 November 2000 and given in volume III and volume IV of the supporting information (excluding the response given to question 2.11 in part B of the application form version 2 November 2000 and given in volume III and IV of the supporting information.)	28/04/2003
Response to schedule 4 Notice Dated 29/08/2003	Response to question 0.1 of the schedule 4 notice dated 29/08/2003 given in appendix 2 in question 2.5 of the application form dated December 2002, restoration concept plan reference RF/WP/03a within appendix 3 and improvement conditions 1, 2 and 3 replaces the response given to questions 2.11 in part B of the application form version 2 November 2000 and given in Volume III and volume IV of the supporting information .	24/09/2003

2.11.2 Where the above Table refers to the whole or parts of different documents, in the event of any conflict between the wording of such documents, the wording of the later document(s) shall prevail to the extent of such conflict.

2.11.3 No condition applies

2.11.4 Notwithstanding condition 2.11.1 of this Permit, the Operator shall carry out a full review of the Site Closure Plan at least every 4 years.

2.11.5 The site closure plan shall be implemented on final cessation or decommissioning of the Permitted activities or part thereof.

2.11.6 The Operator shall give at least 30 days written notice to the Agency before implementing the site closure plan.

2.12 Multiple Operator installations

2.12.1 This is not a multi-Operator installation.

2.13 Transfer to effluent treatment plant

2.13.1 No transfer from the Permitted Installation shall be made to effluent treatment plant .

2.13.2 No condition applies

3 Records

3.1.1 The Operator shall ensure that all records required to be made by this Permit and any other records made by it in relation to the operation of the Permitted Installation shall:-

3.1.1.1 be made available for inspection by the Agency at any reasonable time

3.1.1.2 be supplied to the Agency on demand and without charge

3.1.1.3 be legible

3.1.1.4 be made as soon as reasonably practicable

3.1.1.5 indicate any amendments which have been made and shall include the original record wherever possible; and

3.1.1.6 be retained at the Permitted Installation, or other location agreed by the Agency in writing, for a minimum period of 4 years from the date when the records were made, unless otherwise agreed in writing.

4 Reporting

4.1.1 All reports and written and or oral notifications required by this Permit and notifications required by Regulation 16 of the PPC Regulations shall be made or sent to the Agency using the contact details notified in writing to the Operator by the Agency.

4.1.2 The Operator shall, unless otherwise agreed in writing, submit reports of the monitoring and assessment carried out under condition 2.10, as follows:

4.1.2.1 in respect of the parameters and emission points specified in Table S2 to Schedule 2.

4.1.2.2 for the reporting periods specified in Table S2 to Schedule 2 and using the forms specified in Table S3 to Schedule 3 or other agreed method of reporting;

4.1.2.3 giving the information from such results and assessments as may be required by the forms specified in those Tables; and

4.1.2.4 to the Agency within 28 days of the end of the reporting period.

4.1.3 The Operator shall submit to the Agency a report on the performance of the Permitted Installation over the previous year, by 31 January each year, providing the information listed in Tables S4.2-3 of Schedule 4, assessed at any frequency specified therein.

4.1.4 The Operator shall review fugitive emissions, having regard to the application of the most appropriate measures to prevent pollution, on an annual basis, or such other period as shall be agreed in writing by the Agency, and a summary report on this review shall be sent to the Agency detailing such releases and the measures taken to reduce them within 3 months of the end of such period.

4.1.5 The Operator shall submit an interpretative report of the monitoring results for landfill gas, surface and groundwater against the specified relevant emission limits, assessment limits, control and trigger levels permit on an 12 monthly basis and shall submit a summary report to the Agency to within three months of the end of each period.

4.1.6 Where the Operator has a formal environmental management system applying to the Permitted Installation which encompasses annual improvement targets the Operator shall, not later than 31 January in each year, provide a summary report of the previous year's progress against such targets.

4.1.7 The Operator shall, within 6 months of receipt of written notice from the Agency, submit to the Agency a report assessing whether all appropriate preventive measures continue to be taken against pollution at the installation. The report shall consider any relevant published technical guidance current at the time of the notice which is either supplied with or referred to in the notice, and shall assess the costs and benefits of applying techniques described in that guidance, or otherwise identified by the Operator, that may provide environmental improvement

4.1.8 The Operator shall review all monitoring data required by this permit on an annual basis and shall submit a summary report to the Agency to the agency within three months of the end of each year.

5 Notifications

5.1.1 The Operator shall notify the Agency **without delay** of:

5.1.1.1 the detection of an emission of any substance which exceeds any limit or criterion in this Permit specified in relation to the substance;

5.1.1.2 the detection of any fugitive emission which has caused, is causing or may cause significant adverse environmental effect; unless the quantity emitted is so trivial that it would be incapable of causing significant adverse environmental effect;

5.1.1.3 the detection of any malfunction, breakdown or failure of plant or techniques which has caused, is causing or has the potential to cause significant pollution;

5.1.1.4 any accident which has caused, is causing or has the potential to cause significant pollution; and

5.1.1.5 the refusal or rejection of incoming waste.

5.1.2 The Operator shall submit written confirmation to the Agency of any notification under condition 5.1.1, by sending:

5.1.2.1 the information listed in Part A of Schedule 1 to this Permit within 24 hours of such notification; and

5.1.2.2 the more detailed information listed in Part B of that Schedule as soon as practicable thereafter;

and such information shall be in accordance with that Schedule.

5.1.3 The Operator shall give prior written notification to the Agency of the following events and in the specified timescales:

5.1.3.1 As soon as practicable prior to the permanent cessation of the landfill disposal operations;

5.1.3.2 as soon as practicable prior to the cessation of the operation of the landfill disposal operations, for a period likely to exceed 1 month ;

5.1.3.3 at least 14 days prior to the resumption of the landfill disposal operations after a cessation.

5.1.4 The Operator shall notify the Agency, as soon as practicable, of any information concerning the state of the site which affects or updates that provided to the Agency as part of the Site Report submitted with the application for this Permit.

5.1.5 Operator shall notify the following matters to the Agency in writing within 14 days of their occurrence:

5.1.5.1 where the Operator is a registered company:

a. any change in the Operator's trading name, registered name or registered office address;

b. any change to particulars of the Operator's ultimate holding company (including details of an ultimate holding company where an Operator has become a subsidiary);

c. any steps taken with a view to the Operator going into administration, entering into a company voluntary arrangement or being wound up.

5.1.5.2 where the Operator is a corporate body other than a registered company:

a. any change in the Operator's name or address;

b. any steps taken with a view to the dissolution of the Operator.

5.1.5.3 in any other case:

a. the death of any of the named Operators (where the Operator consists of more than one named individual);

b. any change in the Operator's name(s) or address(es);

c. any steps taken with a view to the Operator, or any one of them, going into bankruptcy, entering into a composition or arrangement with creditors, or, in the case them being in a partnership, dissolving the partnership.

5.1.6 No condition applies

5.1.6.1 No condition applies;

5.1.6.2 No condition applies;

5.1.6.3 No condition applies.

5.1.7 No Condition applies:

5.1.7.1 No Condition Applies;

5.1.7.2 No Condition applies.

6 Interpretation

In this Permit, the following expressions shall have the following meanings:

"*Application*" means the application for this Permit, together with any response to a notice served under Schedule 4 to the PPC Regulations and any operational change agreed under the conditions of this Permit.
"*Authorised Officer*" means any person authorised by the Agency under section 108(1) of The Environment Act 1995 to exercise, in accordance with the terms of any such authorisation, any power specified in Section 108(4) of that Act.
"*background concentration*" means such concentration of that substance as is present in:

- water supplied to the site; or
- where more than 50% of the water used at the site is directly abstracted from ground or surface water on site, the abstracted water; or
- where the Permitted Installation uses no significant amount of supplied or abstracted water, the precipitation onto the site.

"BAT" means best available techniques means the most effective and advanced stage of development of activities and their methods of operation which indicates the practical suitability of particular techniques to prevent and where that is not practicable to reduce emissions and the impact on the environment as a whole. For these purposes: "available techniques" means "those techniques which have been developed on a scale which allows implementation in the relevant industrial sector, under economically and technically viable conditions, taking into consideration the cost and advantages, whether or not the techniques are used or produced inside the United Kingdom, as long as they are reasonably accessible to the operator"; "best" means "in relation to techniques, the most effective in achieving a high general level of protection of the environment as a whole" and "techniques" "includes both the technology used and the way in which the installation is designed, built, maintained, operated and decommissioned." . In addition, Schedule 2 of the PPC Regulations has effect in relation to the determination of BAT. Note again, the possibility of excluding references to BAT.

"Fugitive emission" means an emission to air or water (including sewer) from the Permitted Installation which is not controlled by an emission or background concentration limit under conditions 2.10 of this permit"

"Groundwater" means all water which is below the surface of the ground in the saturation zone and in direct contact with the ground or subsoil.

"The Landfill Regulations" means the Landfill (England and Wales) Regulations SI 2002 No. 1559 and words and expressions defined in the Landfill Regulations shall have the same meanings when used in this Permit, save to the extent that they are specifically defined in this Permit.

"Monitoring" includes the taking and analysis of samples, instrumental measurements (periodic and continual), calibrations, examinations, tests and surveys.

"Permitted Installation" means the activities and the limits to those activities described in Table 1.1.1 of this Permit.

"PPC Regulations" means the Pollution, Prevention and Control (England and Wales) Regulations SI 2000 No.1973 (as amended) and words and expressions defined in the PPC Regulations shall have the same meanings when used in this Permit save to the extent they are specifically defined in this Permit

"Sewer" means sewer within the meaning of section 219(1) of the Water Industry Act 1991.

"*Staff*" includes employees, directors or other officers of the Operator, and any other person under the Operator's direct or indirect control, including contractors.

"*Year*" means calendar year ending 31 December.

6.1.2 Where a minimum limit is set for any emission parameter, for example pH, reference to exceeding the limit shall mean that the parameter shall not be less than that limit.

6.1.3 Unless otherwise stated, any references in this Permit to concentrations of substances in emissions into air means;

6.1.3.1 in relation to gases from combustion processes, the concentration in dry air at a temperature of 273K, at a pressure of 101.3 kPa and with an oxygen content of 3% dry for liquid and gaseous fuels, 6% dry for solid fuels; and/or

6.1.3.2 in relation to gases from non-combustion sources, the concentration at a temperature of 273K and at a pressure of 101.3 kPa, with no correction for water vapour content.

6.1.4 Where any condition of this Permit refers to the whole or parts of different documents, in the event of any conflict between the wording of such documents, the wording of the document(s) with the most recent date shall prevail to the extent of such conflict.

Schedule 1 - Notification of abnormal emissions

This page outlines the information that the Operator must provide to satisfy conditions 5.1.1 and 5.1.2 of this Permit.

Units of measurement used in information supplied under Part A and B requirements shall be appropriate to the circumstances of the emission. Where appropriate, a comparison should be made of actual emissions and authorised emission limits.

If any information is considered commercially confidential, it should be separated from non-confidential information, supplied on a separate sheet and accompanied by an application for commercial confidentiality under the provisions of the PPC Regulations.

Part A

Permit Number	
Name of Operator	
Location of Installation	
Location of the emission	
Time and date of the emission	

Substance[s] emitted	Media	Best estimate of the quantity or the rate of emission	time during which the emission took place
	eg air		
	eg groundwater		

Measures taken, or intended to be taken, to stop the emission	

Part B

Any more accurate information on the matters for notification under Part A.	
Measures taken, or intended to be taken, to prevent a recurrence of the incident	
Measures taken, or intended to be taken, to rectify, limit or prevent any pollution of the environment or harm which has been or may be caused by the emission	
The dates of any unauthorised emissions from the installation in the preceding 24 months.	

Name*	
Post	
Signature	
Date	

* authorised to sign on behalf of *[Mick George (Haulage) Ltd)*

Schedule 2 - Reporting of monitoring data

Parameters for which reports shall be made, in accordance with Part 4 of this Permit, are listed below.

Table S2: Reporting of monitoring data

Parameter	Emission point	Reporting period	Period begins
Surface Water Point of entry of surface water management system to controlled waters	*SW1, SW2, SW3 and Proposed discharge point*	Every 3 months	*From the date of issue of permit*
Groundwater and Landfill Gas (external Boreholes)	*Duelled Boreholes GW1, GW2 and GW3*	Every 3 months	*From date of issue of permit*
Landfill Gas (internal boreholes)	*Points to be agreed with the Environment Agency see improvement condition 4*	Every 3 months	*From the date of installation of borehole*
Waste		Every 3 months	*From the date of issue of the permit*
Interpretative report of the monitoring results for landfill gas, surface and groundwater against the specified relevant emission limits, assessment limits, control and trigger levels.		Every 12 months	*From date of issue of the permit*
Assessment of environmental impact of emissions		Every 12 months	*From the date of issue of the permit*
Assessment of environmental impact on Polopit Brook		Every 12 Months	*From the date of issue of the permit*

Schedule 3 - Forms to be used

Table S3:Reporting Forms		
Media/parameter	Form Number	Date of Form
Surface Water	*None Provided. Reporting format to be agreed in writing with the Agency*	
Groundwater Water	*None Provided. Reporting format to be agreed in writing with the Agency*	
Landfill Gas	*None Provided . Reporting format to be agreed in writing with the Agency*	
Assessment	*None Provided. Reporting format to be agreed in writing with the Agency*	
Waste Return	*None Provided. Reporting format to be agreed in writing with the Agency*	
Minor Operational Changes	*None provided . Reporting format to be agreed in writing with the Agency*	

Schedule 4 - Reporting of performance data

Data required to be recorded and reported by Condition 4.1.3. The data should be assessed on the frequency given and reported annually to the Agency.

Table S4.2: Annual Production/Treatment	
	Tonnes/year
Surface water: Disposed of off site;	
Groundwater: Disposed of off site;	

Table S4.3: Performance parameters			
	Frequency of assessment	Annual average	Units per tonne of waste disposed of
Potable water use	Annual		Cu m/tonne of waste disposed
Non potable water use	Annual		Cu m/tonne of waste disposed

Appendix A

Groundwater and Surface Water monitoring suites

Measurement	Groundwater	Surface Water
Water level (metres to MAOD)	Quarterly/Annually	
Mon. point base		
Visible Oil / grease(Present/Present)		Monthly
Suspended Solids (mg/l)		Quarterly
Temp DO(•)(•)••		
Eh(•)(•)		
PH (Ph units to 0.1)	Quarterly/Annually	Quarterly
EC(uS/cm)	Annually	
NH4-N (mg/l)	Quarterly/Annually	Quarterly
TON (oxidised-N) (mg/l)	Annually	
TOC (mg/l)	Annually	Annually

Se (ug/l)		Annually
Sb(ug/l)		Annually
Hg(ug/l)		Annually
Al(ug/l)		Annually
Ca (mg/l)	Annually	
Mg (mg/l)	Annually	Annually
Na (mg/l)	Annually	
K (mg/l)	Annually	
Alk (mg/l total alkalinity as CaCO3 at pH4.5)	Annually	
SO4 (mg/l)	Annually	Annually
Cl (mg/l)	Quarterly/ Annually	Annually
Fe (mg/l)	Annually	Annually
Mn (ug/l)	Annually	
Cd (ug/l)	Quarterly/ Annually	Annually
Cr (ug/l)	Annually	Annually
Cu (ug/l)	Annually	Annually
Ni(ug/l)	Quarterly/Annually	Annually
Pb (ug/l)	Annually	Annually
Zn (ug/l)	Annually	Annually
Fluorides		Annually
Btex		Annually
PCBs		Annually
PAHs		Annually
TDS		Annually
DOC		Annually

Variation of a PPC Landfill Permit under the Pollution Prevention and Control (England and Wales) Regulations 2000 (SI 2000 No.1973) and the Landfill (England and Wales) Regulations 2002 (SI 2002 No. 1559)

Amended Decision Document recording the decision-making process

Administrative details

Permit number (the "Permit")	**BT9879IY (EP3837LU)**
Applicant (the "Applicant")	**Mick George (Haulage) Limited**
Address/location of Installation (the "Installation")	**Rectory Farm Quarry, Titchmarsh Road, Thrapston, Northamptonshire, NN14 4 NJ**
Name of Account Officer	
Signature of Account Officer:	
Name of Authorising Officer	Tom Ruffell
Signature of Authorising Officer:	
Variation issue date	17/10/06

All relevant documents have been sent to the IPPC Public Registers.

The above permit has been varied by the Environment Agency. The original technical decisions summarised in the body of this document have been revisited.

The varied permit is based on our standard Landfill PPC Permit template (version 3). We developed these conditions in consultation with the waste management industry having regard to the legal requirements of the PPC Regulations, the Landfill Regulations and other relevant legislation.

Annex 1 details any changes to the original decisions made. It does not include an explanation for the standard conditions. These have been imposed on the basis that we have considered the application and accepted the details are sufficient and satisfactory to control that aspect of the operation.

The structure of the varied permit is slightly different than the original permit issued. The revised format has been developed on the basis of experience gained since 2000 of permitting landfills under the PPC regime, discussion with industry and the outcome of appeals against permit conditions.

Certain conditions that were included in the original permit are considered to be unnecessary and these no longer appear in the varied permit. The Table in Annex 2 summarises the changes between permit template version 1.1 and version 3.

Annex 1 – Permit Variation

No changes made to the original decisions.

Annex 2 - Map of template version 1.1 conditions to version 3 conditions

Condition	Version 1.1 Template	Condition	Version 3 Template
	Contents page		**Removed as unnecessary**
	Introductory Note		Introductory Note
	General Information		**Removed as unnecessary**
	Permit		Permit
1.1.1	**Permitted activities**	2.1.1	Reference to Schedule 1, Table S1.1
1.1.2	**Exempt activities**	-	No equivalent condition
1.2	**The site**	2.2	The site
1.3	**Overarching Management Condition**	1.1.1	General management
1.4	**Improvement Programme**	2.5	Improvement Programme
1.5	**Minor Operational Changes**	2.3.1	No directly equivalent condition, partly covered by Operating techniques.
1.6	**Pre-operational conditions**	2.6	Pre-operational conditions + Engineering
		2.7	
1.7	**Off-site conditions**	2.4	Off-site conditions
2.1.1	**Landfilling controls**	2.3	Reference to Schedule 1, Table S1.2
2.1.2	**Waste acceptance**	2.8.1	Waste acceptance
2.1.2.1	**Waste inspection**	2.8.5	Waste inspection
2.1.2.2	**Waste samples**	2.8.6	Waste samples
2.1.2.3	**Waste receipt**	2.8.7	Waste receipt
2.1.2.4	**Site security**	1.4.1	Site security
2.1.3	***Total site capacity***	2.8.8	*Total site capacity*
2.1.4	**Annual quantity**	2.8.9	Reference to Schedule 1, Table S5.1
2.1.5 - 2.1.6	**Record of waste accepted**	2.8.10	Record of waste accepted
2.2.1	**Emissions to air (excluding odour noise and vibration) from specified points**	3.1	Emission to air, water or land (refer to Schedule 4)
2.2.3	**Emissions to water (other than groundwater) from specified points**	3.1	Emission to air, water or land (refer to Schedule 4)
	Emission to water	3.1	Emission to air, water or land (refer to Schedule 4)
	Emission to sewer	3.1	Emission to air, water or land (refer to Schedule 4)
2.2.5	**Emission to groundwater**	3.2	Emission to groundwater + Schedule 4, Table S4.2 and S4.6
2.2.5.1	**List I prohibition**	3.2.1	**List I prohibition**
2.2.5.2	***List II prohibition***	3.2.2	**List II prohibition**
2.2.5.3	**Non-listed substance control**	-	**No equivalent condition**
2.10.1	**Trigger levels**	2.3.3	**Reference to Schedule 4, Table S4.2**
2.2.5.4	**HRA review**	3.2.4	**HRA review**
2.2.6.1	**Fugitive emissions of substances to air**	3.3	Fugitive emissions of substances
2.2.6.2	**Fugitive - gas, litter, particulates**	3.3.2	*Litter and mud*
2.2.8	***Particulate emission limits***	3.3.5	**Reference to Schedule 4**
2.2.9	**Fugitive - to water and sewer**	3.3.1	**Fugitive emissions of substances**
2.2.10	**Odour**	3.4	Odour
2.2.11	**Emissions to land**	3.3.1	**Fugitive emissions of substances**
2.3	**Management of FAPPs**	-	**No equivalent condition**
2.3.1	Copy of permit etc…	1.1.3	**Access to copy of permit etc…**
2.3.2 – 2.3.4	**Training**	1.1.1(b)	*competent persons*
2.3.5 –	**Maintenance**	1.1.1	**General management**

2.3.6			
2.3.7 – 2.3.8	**Incidents and complaints**	1.1.1	**General management**
2.3.9 – 2.3.10	**FAPP**	1.3	Finance
2.4	**Efficient use of raw materials**	-	**No equivalent condition**
2.5	**Waste storage and handling**	-	**No equivalent condition**
2.6	**Waste recovery or disposal**	-	**No equivalent condition**
2.7	**Energy efficiency**	1.4	Energy efficiency
2.8	**Accident prevention and control**	1.2	Accidents that may cause pollution
2.9	**Noise and vibration**	3.5	Noise and vibration
2.10	**On site monitoring**	3.6	Monitoring
2.10.1	***…points, parameters and frequencies***	3.6.1	Reference to Schedule 4 Tables S4.1 – 4.6
2.10.6	**Noise monitoring**	-	**No equivalent condition**
2.10.7	***14 days notice of monitoring***	4.3.5	**Notifications**
2.10.8	Maintain records	3.6.2	*Maintain records*
2.10.9.1 + 2.10.9.2	Safe access…	-	**No equivalent condition**
2.10.4	**Landfill Gas**	3.6.1(d)	Reference to Tables S4.3 and S4.4
2.10.5	**Leachate**	2.9 + 3.6.1(a)	Leachate levels + Reference to Tables S4.1
2.11	**Closure, aftercare and decommissioning**	2.10	Closure, aftercare and decommissioning
2.12	**Multiple operator installations**	1.6	Multiple operator installations
2.13	**Transfer to effluent treatment plant**	-	**No equivalent condition (see schedule 4)**
3	**Records**	4	Information
3.1.1	Records	4.1	Records
4	**Reporting**	4.2	Reporting
5	**Notifications**	4.3	Notifications
6	**Interpretation**	4.4	Interpretation, Reference to Schedule 7
Sch. 1	**Notifications**	Sch. 6	Notifications
Sch. 2	**Reporting monitoring data**	Sch. 4	Emissions and Monitoring
Sch. 3	**Forms to be used**	Sch. 5	Reporting
Sch. 4	**Reporting of performance data**	Sch. 5	Reporting
Sch. 5	**Site Plan**	Sch. 2	Site Plan
Sch. 6	**List of permitted wastes**	Sch. 3	List of permitted wastes

Variation Notice with introductory note

Pollution Prevention and Control (England & Wales) Regulations 2000

Rectory Farm Quarry

Mick George (Haulage) Limited
Rectory Farm Quarry
Titchmarsh Road
Thrapston
Northamptonshire
NN14 4NJ

Variation Notice Number
EP3837LU

Permit number

BT9879IY

Rectory Farm Quarry
Permit Number BT9879IY

Introductory note

This introductory note does not form a part of the permit

The following notice is issued under regulation 17 of The Pollution Prevention and Control (England and Wales) Regulations 2000 (S.I.2000 No. 1973 (as amended) (the Regulations) to vary the conditions of a permit issued under the Regulations to operate an installation. The notice comprises schedule 1 containing conditions to be deleted, schedule 2 conditions to be amended and schedule 3 conditions to be added.

The main features of the installation are as follows.

Rectory Farm Quarry is a sand and gravel pit operated by Mick George (Haulage) Limited located around Grid Reference TL01467834 ,1.3km south-west of Titchmarsh and Polopit villages. The site is classified as a minor aquifer. The sand and gravel pit will be restored by the landfilling of inert waste. The site will be engineered inline with the Landfill Regulations (England and Wales) 2002.It is proposed that the site will be operational for five years with an importation rate of 75,000 tonnes of inert material per year.

Status Log of the permit		
Detail	Date	Response Date
Application BT9879IY	Duly made 28/04/03	
Additional Information received	Request dated 29/08/03	Response dated 24/09/03
	Request dated 20/10/03	Response dated 23/10/03
		Response dated 27/10/03
		Response dated 31/10/03
		Response dated 21/11/03
Permit determined	05/07/04	
Variation notice EP3837LU issued	17/10/06	

Other existing Licences/Authorisations/Registrations relating to this site		
Holder	Reference Number	Date of issue
Mick George (Haulage)Ltd	PRNNF/12740 01 (Discharge consent)	08/07/02

End of Introductory Note

Variation Notice

Permit number
BT9879IY
Variation number
EP3837LU

The Environment Agency (the Agency) in exercise of its powers under Regulation 17 of the Pollution Prevention and Control (England and Wales) Regulations 2000 (SI 2000 No 1973) hereby varies the permit held by you

Mick George (Haulage) Limited ("the Operator"),

whose registered office is
Second Drove
Meadow Lane
St Ives
Cambridgeshire
PE17 4YQ

Company registration number 2417831

to operate an installation at
Rectory Farm Quarry
Tichmarsh Road
Thrapston
Northamptonshire
NN14 4NJ

to the extent set out in schedules 1 to 3 of this variation notice.

The notice shall take effect from 18 October 2006 at 00.01 hours.

Signed	Date
	17/10/2006

Tom Ruffell

Waste Permitting Team Leader

Authorised to sign on behalf of the Agency

SCHEDULE 1 – CONDITIONS TO BE DELETED

1. All conditions and schedules are deleted

SCHEDULE 2 – CONDITIONS TO BE AMENDED

2. None

SCHEDULE 3 – CONDITIONS TO BE ADDED

3. The following conditions are added to the permit

Conditions

1. Management

1.1 General management

1.1.1 The Activities shall be managed and operated:

(a) in accordance with a management system, which identifies and minimises risks of pollution, including those arising from operations, maintenance, accidents, incidents and non-conformances and those drawn to the attention of the operator as a result of complaints; and

(b) by sufficient persons who are competent in respect of the responsibilities to be undertaken by them in connection with the operation of the Activities.

1.1.2 Records demonstrating compliance with condition 1.1.1 shall be maintained.

1.1.3 Any person having duties that are or may be affected by the matters set out in this permit shall have convenient access to a copy of it kept at or near the place where those duties are carried out.

1.2 Accidents that may cause pollution

1.2.1 The operator shall:

(a) maintain and implement an accident management plan;

(b) review and record at least every 4 years or as soon as practicable after an accident, (whichever is the earlier) whether changes to the plan should be made;

(c) make any appropriate changes to the plan identified by a review.

1.3 Finance

1.3.1 The financial provision for meeting the obligations under this permit set out in the agreement made between the operator and the Agency dated 5th July 2004 shall be maintained by the operator throughout the subsistence of this permit and the operator shall produce evidence of such provision whenever required by the Agency.

1.3.2 The operator shall ensure that the charges it makes for the disposal of waste in the landfill cover the cost of operating the landfill, as far as possible the cost of the financial provision required by condition 1.3.1 and thus the estimated costs for the closure and aftercare of the landfill.

1.4 Site security

1.4.1 Site security measures shall prevent unauthorised access to the site, as far as practicable.

2. Operations

2.1 Permitted activities

2.1.1 The operator is authorised to carry out the activities specified in schedule 1 table S1.1 (the "Activities").

2.2 The site

2.2.1 The Activities shall not extend beyond the Site, being the land shown edged in red on the site plan at schedule 2 to this permit.

2.3 Operating techniques

2.3.1 The Activities shall, subject to the conditions of this permit, be operated using the techniques and in the manner described in the documentation specified in schedule 1 table S1.2, unless otherwise agreed in writing by the Agency.

2.4 Off-site conditions

2.4.1 The operator shall, unless otherwise agreed in writing by the Agency, undertake monitoring for the parameters, at the locations and at not less than the frequencies specified, in the following tables in schedule 4 to this permit

(a) surface water specified in table S4.5

(b) groundwater specified in table S4.2 and S4.6

(c) landfill gas specified in table S4.3

2.5 Improvement programme

2.5.1 The operator shall complete the improvements specified in schedule 1 table S1.3 by the date specified in that table unless otherwise agreed in writing by the Agency.

2.6 Pre-operational conditions

There are no pre-operational conditions in this permit.

2.7 Engineering

2.7.1 No construction of any new cell shall commence until the operator has submitted construction proposals and the Agency has confirmed that it is satisfied with the construction proposals.

2.7.2 The construction of a new cell shall take place only in accordance with the approved construction proposals unless:

(a) any change to the approved construction proposals would have no impact on the performance of any element of the design; or

(b) a change has otherwise been agreed in writing by the Agency.

2.7.3 No disposal of waste shall take place in a new cell until the operator has submitted a CQA Validation Report and the Agency has confirmed that it is satisfied with the CQA Validation Report.

2.7.4 No construction of landfill Infrastructure shall commence until the operator has submitted relevant construction proposals or a written request to use previous construction proposals and the Agency has confirmed that it is satisfied with the construction proposals.

2.7.5 The construction of the Landfill Infrastructure shall take place only in accordance with the approved construction proposals unless:

(a) any change to the approved construction proposals would have no impact on the performance of any element of the design; or

(b) a change has otherwise been agreed in writing by the Agency.

2.7.6 The operator shall submit a CQA Validation Report as soon as practicable following the construction of the relevant Landfill Infrastructure.

2.7.7 Where pollution controls are immediately necessary to prevent an incident or accident, then conditions 2.7.4 and 2.7.5 do not apply and the relevant Landfill Infrastructure may be constructed, provided that the construction proposals are submitted to the Agency as soon as practicable.

2.7.8 For the purposes of conditions 2.7.1, 2.7.3 and 2.7.4, the Agency shall be deemed to be satisfied where it has not, within the period of 4 weeks from the date of receipt of the relevant construction proposals or CQA Validation Report, either:

(a) confirmed whether or not it is satisfied; or

(b) informed the operator that it requires further information.

2.8 Waste acceptance

2.8.1 Wastes shall only be accepted for disposal if:

(a) they are listed in schedule 3, and

(b) they are inert waste, and

(c) they are not liquid waste (including waste waters but excluding sludge), and

(d) all the relevant waste acceptance procedures set out in schedule 1 of the Landfill Regulations have been completed, and

(e) they fulfil the relevant waste acceptance criteria, and

(f) they have not been diluted or mixed solely to meet the relevant waste acceptance criteria, and

(g) they are wastes which have been treated, except for wastes for which treatment is not technically feasible.

2.8.2 The operator shall visually inspect:

(a) without unloading it, waste that is not in an enclosed container or enclosed vehicle on arrival at the landfill; and

(b) waste at the point of deposit;

and shall satisfy itself that it conforms to the basic characterisation documentation submitted by the holder.

2.8.3 Where the operator has taken samples to establish that the waste is in conformity with the documentation submitted by the holder then the samples taken shall be retained for at least one month and results of any analysis for at least two years.

2.8.4 The operator on accepting each delivery of waste shall provide a receipt to the person delivering it.

2.8.5 The total quantity of waste that shall be deposited in the landfill shall be limited by the pre-settlement levels shown on drawing submitted in the Improvement Programme Condition 5.

2.8.6 The quantity of waste that is deposited in the landfill in any year shall not exceed the limits in schedule 1 table S1.5.

2.8.7 The operator shall maintain and implement a system which ensures that a record is made of the quantity, characteristics, date of delivery and, where practicable, origin of any waste that is received for disposal or recovery and of the identity of the producer, or in the case of multiple collection vehicles, of the collector of such waste. Any information regarded by the operator as commercially confidential shall be clearly identified in the record.

2.9 Closure, aftercare and decommissioning

2.9.1 The operator shall maintain and operate the Activities so as to prevent or where that is not practicable, to minimise, any pollution risk on closure and decommissioning.

3. Emissions and monitoring

3.1 Emissions to water, air or land

3.1.1 There shall be no point source emissions to water, air or land except from the sources and emission points listed in schedule 4 tables S4.1 .

3.2 Emissions to groundwater

3.2.1 There shall be no emission from the activities into groundwater of any substance in List I (as defined by the Groundwater Regulations) contrary to those Regulations.

3.2.2 There shall be no emission from the activities into groundwater of any substance in List II (as defined in the Groundwater Regulations) so as to cause pollution (as defined in those Regulations).

3.2.3 The trigger levels for emissions into groundwater for the parameter(s) and monitoring point(s) set out in schedule 4 table S4.2 of shall not be exceeded.

3.2.4 The operator shall submit to the Agency a review of the Hydrogeological Risk Assessment:

(a) between 9 and 6 months prior to the fourth anniversary of the granting of the permit, and

(b) between 9 and 6 months prior to every subsequent 4 years after the fourth anniversary of the granting of the permit.

3.3 Fugitive emissions of substances

3.3.1 Fugitive emissions of substances (excluding odour, noise and vibration) shall not cause pollution. The operator shall not be taken to have breached this condition if appropriate measures have been taken to prevent or where that is not practicable, to minimise, those emissions.

3.3.2 Litter or mud arising from the activities shall not cause pollution. The operator shall not be taken to have breached this condition if appropriate measures have been used to prevent or where that is not practicable to minimise, the litter and mud.

3.3.3 Litter or mud arising from the activities shall be cleared from affected areas outside the Site as soon as practicable.

3.3.4 All liquids, whose emission to water or land could cause pollution, shall be provided with secondary containment, unless the operator has used other appropriate measures to prevent or where that is not practicable, to minimise, leakage and spillage from the primary container.

3.3.5 The limits for landfill gas set out in schedule 4, table S4.3, shall not be exceeded.

3.4 Odour

3.4.1 Emissions from the activities shall be free from odour at levels likely to cause annoyance outside the Site, as perceived by an authorised officer of the Agency, unless the operator has used appropriate measures to prevent or where that is not practicable to minimise the odour.

3.5 Noise and vibration

3.5.1 Emissions from the Activities shall be free from noise and vibration at levels likely to cause annoyance outside the site, as perceived by an authorised officer of the Agency, unless the operator has used appropriate measures to prevent or where that is not practicable to minimise the noise and vibration.

3.6 Monitoring

3.6.1 The operator shall, unless otherwise agreed in writing by the Agency, undertake the monitoring for the parameters, specified in the following tables in schedule 4 to this permit:

(a) Point source emissions specified in tables S4.1;

(b) Groundwater specified in tables S4.2 and S4.6;

(c) Landfill gas specified in tables S4.3 and S4.4;

(d) Surface water specified in table S4.5

3.6.2 The operator shall maintain records of all monitoring required by this permit including records of the taking and analysis of samples, instrument measurements (periodic and continual), calibrations, examinations, tests and surveys and any assessment or evaluation made on the basis of such data.

3.6.3 A topographical survey of the site referenced to Ordnance Datum shall be carried out:

(a) annually, and

(b) prior to the disposal of waste in any new cell or new development area of the landfill, and

(c) following closure of the landfill or part of the landfill.

The topographical survey shall be used to produce a plan of a scale adequate to show the surveyed features of the site.

3.7 Transfers off-site

3.7.1 Records of all the wastes sent off site from the activities, for either disposal or recovery, shall be maintained.

4. Information

4.1 Records

4.1.1 All records required to be made by this permit shall:

(a) be legible;

(b) be made as soon as reasonably practicable;

(c) if amended, be amended in such a way that the original and any subsequent amendments remain legible, or are capable of retrieval; and

(d) be retained, unless otherwise agreed in writing by the Agency, for at least 6 years from the date when the records were made, or in the case of the following records until permit surrender:

(i) the results of groundwater monitoring;

(ii) sub-surface landfill gas monitoring;

(iii) waste types and quantities;

(iv) topographical surveys; and

(v) the specification and as built drawings of the basal, sidewall and capping engineering systems

4.1.2. Any records required to be made by this permit shall be supplied to the Agency within 14 days where the records have been requested in writing by the Agency.

4.1.3. All records required to be held by this permit shall be held on the site and shall be available for inspection by the Agency at any reasonable time.

4.2 Reporting

4.2.1 A report or reports on the performance of the activities over the previous year shall be submitted to the Agency by 31 January (or other date agreed in writing by the Agency) each year. The report(s) shall include as a minimum:

(a) a review of the results of the monitoring and assessment carried out in accordance with this permit against the relevant assumptions, parameters and results in the risk assessments submitted with the Application;

(b) where the operator's management system encompasses annual improvement targets, a summary report of the previous year's progress against such targets;

(c) the annual production/treatment set out in schedule 5 table S5.2.

(d) details of any contamination or decontamination of the site which has occurred;

(e) the topographical surveys required by condition 3.6.3 other than those submitted as part of a CQA validation report;

(f) the volumetric difference (reported in cubic metres) between the most recent topographical survey and the previous annual topographical survey i.e. the additional volume of the landfill void that is occupied by waste;

(g) an assessment of the settlement behavior of the landfill body based on the difference between the most recent topographical survey and previous annual topographical survey for the areas of the landfill which did not receive waste between the surveys;

(h) a calculation of the remaining capacity (reported in cubic metres) derived from the pre-settlement contours and the most recent topographical survey;

(i) the compliance testing undertaken in the period;

4.2.2 Within 28 days of the end of the reporting period the operator shall, unless otherwise agreed in writing by the Agency, submit reports of the monitoring and assessment carried out in accordance with the conditions of this permit, as follows:

(a) in respect of the parameters and emission points specified in schedule 5 table S5.1;

(b) for the reporting periods specified in schedule 5 table S5.1 and using the forms specified in schedule 5 table S5.3; and

(c) giving the information from such results and assessments as may be required by the forms specified in those tables.

4.2.3 A summary report of the waste types and quantities accepted and removed from the site shall be made for each quarter. It shall be submitted to the Agency within one month of the end of the quarter and shall be in the format required by the Agency.

4.2.4 The operator shall, unless notice under this condition has been served within the preceding 4 years, submit to the Agency, within 6 months of receipt of a written notice, a report assessing whether there are other appropriate measures that could be taken to prevent, or where that is not practicable, to minimise pollution.

4.2.5 All reports and notifications required by the permit shall be sent to the Agency using the contact details supplied in writing by the Agency

4.3 Notifications

4.3.1 The Agency shall be notified without delay following the detection of:

(a) any malfunction, breakdown or failure of equipment or techniques, accident, or fugitive emission which has caused, is causing or may cause significant pollution;

(b) the breach of a limit specified in the permit;

(c) any significant adverse environmental effects.

4.3.2 Any information provided under condition 4.3.1 shall be confirmed by sending the information listed in schedule 6 to this permit within the time period specified in that schedule.

4.3.3. Prior written notification shall be given to the Agency of the following events and in the specified timescales:

(a) as soon as practicable prior to the permanent cessation of any of the permitted activities;

(b) as soon as practicable prior to the cessation of the landfill disposal activities, for a period likely to exceed 1 month; and

(c) at least 7 days prior to the resumption of the landfill disposal activities after a cessation notified under (b) above.

4.3.5 Where the Agency has requested in writing that it shall be notified when the operator is to undertake monitoring and/or spot sampling, the operator shall inform the Agency when the relevant monitoring is to take place. The operator shall provide this information to the Agency at least 14 days before the date the monitoring is to be undertaken.

4.3.6 The Agency shall be notified within 7 days of any changes in technically competent management and the name of any incoming person together with evidence that such person has the required technical competence.

4.3.7 The Agency shall be provided, within 14 days of the operator or any relevant person being convicted of a relevant offence, (unless such information has already been notified to the Agency), with details of the nature of the offence, the place and date of conviction, and the sentence imposed.

4.3.8 The Agency shall be notified within 14 days of the operator and/or any relevant person lodging an appeal against a conviction for any relevant offence and of the outcome when the appeal is decided.

4.3.9 The Agency shall be notified within 14 days of the occurrence of the following matters, except where such disclosure is prohibited by Stock Exchange rules:

(a) any change in the operator's trading name, registered name or registered office address;

(b) any change to particulars of the operator's ultimate holding company (including details of an ultimate holding company where an operator has become a subsidiary); and

(c) any steps taken with a view to the operator going into administration, entering into a company voluntary arrangement or being wound up.

4.4 Interpretation

4.4.1 In this permit the expressions listed in schedule 7 shall have the meaning given in that schedule.

Schedule 1 - Operations

Table S1.1 Activities		
Activity listed in schedule 1 of the PPC Regulations	Description of specified activity	Limits of specified activity
Section 5.2 Part A(1) (b), The disposal of waste in a landfill.	Landfill for inert waste (landfill classification under the Landfill Regulations 2002)	Receipt, handling, storage and disposal of wastes, consisting of the types and quantities specified in conditions 2.8, as an integral part of landfilling.
Directly Associated Activity		
Water discharges to controlled waters.	Discharges of site drainage from the landfill.	From surface water management system to point of entry to controlled waters.

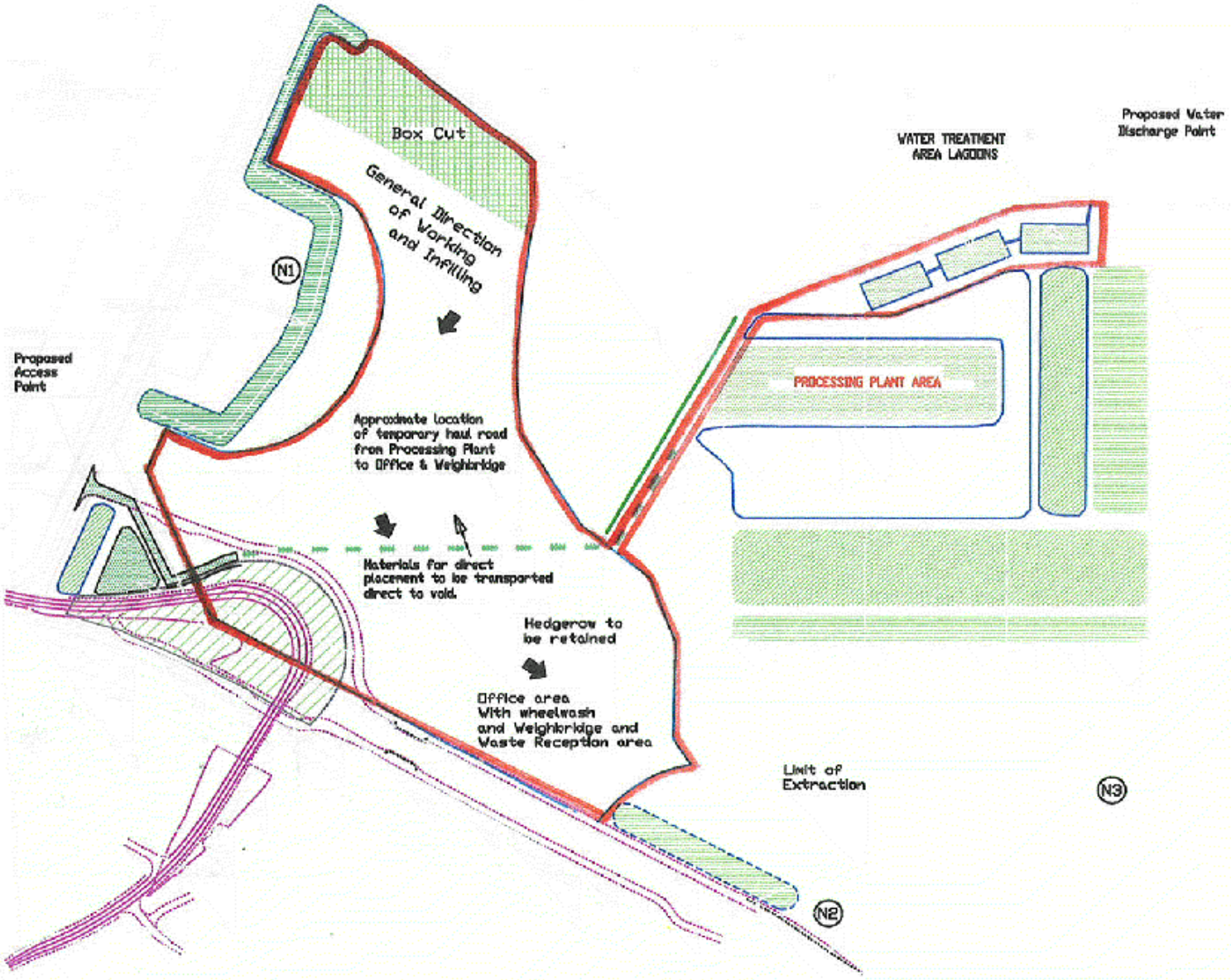
Table S1.2: Operating techniques		
Description	Parts	Date Received
Application	The response to questions 1.1-1.3, 2.1-2.12 in part B of the application form version 2 November 2000 and given in Volume I, II III and IV of the application (excluding the response to questions 1.1-1.3, 2.1-2.12 in part B of the application form version 2 November 2000 and given in Volume I,II,III and IV of the application)	28/04/2003
Response to letter dated 29/08/03	The response to letter dated 29/08/03 is given in letter dated 24/09/03 REF: DW-T2/4	24/09/2003
Response to schedule 4 Notice dated 29/08/2003	Response to questions 0.1 , 1.1.1-1.1.5, 1.1.10-1.1.15, 1.1.27-1.1.32, 1.2.28-1.2.29, 2.1.1, 2.2.1, 2.2.6, 2.2.8, 2.3.16, 2.3.34, 2.3.42, 2.3.48, 2.3.63, 2.3.67-2.3.68, 2.3.70-2.3.71, 2.3.85, 2.4.1, 2.4.4, 4.1.1-4.1.2, 4.3.4, of the schedule 4 notice dated 29/08/2003 given in appendices 1- 24 and volumes I - V replaces questions1.1- 1.3 and 2.1- 2.12 in part B of the application form version 2 November 2000 and with supporting information given in Volume I , II, III and IV .	24/09/2003
Response to letter dated 20/10/2003	The response to question 1.1.1 of the letter dated 20/10/03 ref: BT9879 given in plan reference number RF/REC/01a dated Oct 2003 replaces plan reference RF/SR/01 given in response to question 1.1.1 of the schedule 4 notice dated Sept 2003	23/10/2003
Response to letter dated 20/10/2003	Response to question 1.1.27 and 1.1.30 of the letter dated 20/10/03 ref:BT9879 given in plans referenced RF/GEO/02c Oct 2003 and RF/SR/06a Oct 2003 replaces Plans reference RF/SR/06 dated Sept 03 and RF/GEO/02a dated Sept 2003 in response to questions 1.1.27 and 1.1.30 of the schedule 4 notice dated 29/08/03	23/10/2003
Response to letter dated 20/10/2003	Response to question 1.1.31 of the letter dated 20/10/2003 ref:BT9879 given in letter dated 23/10/2003 ref:DW/SB-T2/4 supplements the response to question 1.1.31 of the schedule 4 notice dated 29/08/03 given in appendix 12 .	23/10/2003
Response to the letter dated 20/10/2003	Response to question 2.4.1 of the letter dated 20/10/2003 given in amended Appendix F of appendix 23 replaces the response to the schedule 4 notice dated 29/08/03 given in appendix F of appendix 23.	23/10/2003
Response to letter dated 20/10/2003	Response to questions 2.2.1 and 2.2.8 of the letter dated 20/10/2003 given in the document entitled Rectory Farm Waste Acceptance Criteria and Procedures-Rev A dated Oct 2003 replaces the response to questions 2.2.1 and 2.2.8 of the schedule 4 notice dated 29/08/03 given in appendix 14	27/10/2003
Response to letter dated 20/10/2003	Response to question 2.3.34 of the letter dated 20/10/2003 given in the letter dated 27/10/2003 REF: DW/JB-T2/4 supplements the response to question 2.3.34 of the schedule 4 notice dated 29/08/03.	27/10/2003

Response to letter dated 20/10/2003	Response to question 2.3.48 of the letter dated 20/10/2003 given in Gas Monitoring Action Plan Rev A dated Oct 2003 and the amended questions 2.3.48 and 2.3.49 of Part B of the application form replaces the response given to question 2.3.48 of the schedule 4 notice dated 29/08/03 and questions 2.3.48 and 2.3.49 of Part B of the application form submitted in response to question 0.1 of the schedule 4 notice dated 29/08/03	27/10/2003
Response to letter dated 20/10/2003	Response to question 2.4.1 of the letter dated 20/10/2003 given in the letter dated 27/10/03 Ref:DW/JB-T2/4 replaces the response given to question 2.4.1 of the schedule 4 notice dated 29/08/03 in question 2.4.1 of part B of the application form submitted in response to question 0.1 of the schedule 4 notice dated 29/08/03.	27/10/2003
Response to letter dated 20/10/2003	Response to question 1.1.12 of the letter dated 20/10/2003 given in the letter dated 31/10/2003 REF: DW/JB-T2/4 in section 1. Question 2.1.12 supplements the response given to question 1.1.12 of the schedule 4 notice dated 29/08/03 given in appendix 24	31/10/2003
Schedule 4 notice dated 29/08/2003	Response to question 1.1.31 of the schedule 4 notice dated 29/08/2003 given in the letter dated 21/11/03 REF: DW/JB-T2/4 supplements the response given to question 1.1.31 of the schedule 4 notice dated 29/08/03 given in appendix 12	21/11/2003
E-mail from Dan Walker Marwalk Developments Limited dated 01/03/04 ref:DW-T2/4	Information in e-mail supplements information contained in appendix 15 of the schedule 4 notice response dated 29/08/03	01/03/2004
E-mail from Dan Walker Marwalk Developments Limited dated 08/04/04	Information in e-mail on groundwater monitoring suite supplements information contained in the schedule 4 notice response dated 29/08/03	08/04/04
Application	The response to questions 2.11 In Part B of the application form version 2 November 2000 and given in volume III and volume IV of the supporting information (excluding the response given to question 2.11 in part B of the application form version 2 November 2000 and given in volume III and IV of the supporting information.)	28/04/2003
Response to Schedule 4 Notice Dated 29/08/2003	Response to question 0.1 of the schedule 4 notice dated 29/08/2003 given in appendix 2 in question 2.5 of the application form dated December 2002, restoration concept plan reference RF/WP/03a within appendix 3 and improvement conditions 1, 2 and 3 replaces the response given to questions 2.11 in part B of the application form version 2 November 2000 and given in Volume III and volume IV of the supporting information.	24/09/2003

Table S1.3 Improvement programme requirements		
Reference	Requirement	Date
IC 1	A permitted installation closure plan shall be produced in consultation with the Agency and in accordance with council directive 1999/31/EC on the Landfill of Waste(26 April 1999). It shall specify the detailed procedure the operator proposes to implement upon the closure of the permitted landfill. The closure plan will be subject to approval by the Agency in writing and shall not be considered accepted or acceptable until such approval is given.	31/03/09
IC 2	A permitted installation post-closure aftercare and restoration plan shall be produced in consultation with the Agency in accordance with council directive 1999/31/EC on the landfill of waste (26 April 1999). It shall specify the detailed procedures the operator proposes to implement upon the permitted landfill being considered by the Agency to be in post closure and after care phase of its operations. The plan will be subject to approval by the Agency in writing and shall not be considered accepted or acceptable until such approval is given.	31/03/09
IC 3	A permitted installation decommissioning plan prior to surrender shall be produced in consultation with the Agency and in accordance with council directive 1999/31/EC on the landfill of waste (26 April 1999). It shall specify the detailed procedures the operator proposes to implement upon the Permitted installation being considered by the Agency to be suitable to decommission prior to surrender. The plan will be subject to approval by the Agency in writing and shall not be considered accepted or acceptable until such approval is given.	31/03/09
IC 4	Proposals for the location of the additional in waste boreholes for the monitoring of landfill gas to be retrofitted shall be submitted to the Agency and will be subjected to approval by the Agency in writing and shall not be considered accepted or acceptable until such approval is given.	1 month after each phase completion
IC 5	A drawing showing the pre-settlement levels of the landfill shall be submitted to the Agency for approval. The total quantity of waste that shall be deposited in the landfill shall be limited by the pre-settlement levels shown in the drawing as required in Condition 2.8.5.	31/12/06

Table S1.5 Annual Waste Input Limits	
Category	Limit Tonnes/ Year
Inert Waste	75 000

Schedule 2 - Site plan



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Schedule 3 - List of permitted wastes

Wastes that may be accepted without testing at a landfill for inert waste

EWC Code	Description	Restrictions
17 01 01	Concrete	Selected C&D waste only[(a)]
17 01 02	Bricks	Selected C&D waste only[(a)]
17 01 03	Tiles and ceramics	Selected C&D waste only[(a)]
17 01 07	Mixtures of concrete, bricks, tiles and ceramics	Selected C&D waste only[(a)]
17 05 04	Soil and stones	Excluding topsoil, peat; excluding soil and stones from contaminated sites

(a) Selected construction and demolition waste (C & D waste): with low contents of other types of materials (like metals, plastic, organics, wood, rubber, etc). The origin of the waste must be known.

No C & D waste from constructions, polluted with inorganic or organic dangerous substances, e.g. because of production processes in the construction, soil pollution, storage and usage of pesticides or other dangerous substances, etc., unless it is made clear that the demolished construction was not significantly polluted.

No C & D waste from constructions, treated, covered or painted with materials, containing dangerous substances in significant amounts.

Schedule 4 – Emissions and monitoring

Table S4.1 Point source emissions to water (other than sewer) – emission limits and monitoring requirements						
Emission point Ref. & Location	Parameter	Source	Limit (incl unit)	Reference Period	Monitoring Frequency	Monitoring Standard or Method
Proposed water discharge Point (consent number PRNNF/12740 01) located on drawing number RF/SR/06a as Proposed water discharge point.	pH	Surface water	6-9		Quarterly	In accordance with Agency Guidance LFTGN02 - 'Monitoring of Landfill Leachate, Groundwater and Surface Water'
	Suspended Solids		40 mg/l		Quarterly	
	Visible Oils		None visible		Monthly	
	Ammonium N		1 mg/l		Quarterly	

Table S4.2 Trigger levels for emissions into groundwater and monitoring requirements					
Monitoring point reference(1)	Parameter	Limit (including unit)	Reference Period	Monitoring frequency	Monitoring standard or method
GW2	Cadmium	0.1 ug/l		Quarterly	In accordance with Agency Guidance LFTGN02 - 'Monitoring of Landfill Leachate, Groundwater and Surface Water'
GW3(2)	Chloride	250 mg/l			
	Ammonium N	1 mg/l			
	Nickel	20 ug/l			
(1) Identified on drawing number RF/Geo/02c dated Oct 2003					
(2) Off-site monitoring point					

Table S4.3 Landfill gas in external monitoring boreholes – limits and monitoring requirements				
Monitoring point Ref. /description(1)	Parameter	Limit (including units)	Monitoring frequency	Monitoring standard or method
GW1	Methane	1 %v/v	Quarterly	In accordance with Agency Guidance LFTGN03 – 'Guidance on the Management of Landfill Gas'
GW2	Carbon Dioxide	1.5 %v/v		
GW3(2)	Oxygen	no limit		
	Atmospheric pressure	no limit		
	Temperature	no limit		
	Meteorological data	no limit		
(1) Identified on drawing number RF/Geo/02c dated Oct 2003				
(2) Off-site monitoring point				

Table S4.4 Landfill gas – other monitoring requirements				
Emission point reference or source or description of point of measurement	Parameter	Monitoring frequency	Monitoring standard or method	Other specifications
In waste monitoring borehole GAS1	Methane Carbon Dioxide Oxygen Atmospheric pressure Differential pressure Temperature Meteorological Data	Quarterly	In accordance with Agency Guidance LFTGN03 – 'Guidance on the Management of Landfill Gas'	

Table S4.5 Surface water – other monitoring requirements				
Emission point reference or source or description of point of measurement	Parameter	Monitoring frequency	Monitoring standard or method	Other specifications
SW1 SW2(1) SW3(1)	pH Suspended solids Ammonium N	Quarterly	In accordance with Agency Guidance LFTGN02 - 'Monitoring of Landfill Leachate, Groundwater and Surface Water'	
	Visible oil/grease	Monthly		
	TOC	Annually		
	Se			
	Sb			
	Hg			
	Al			
	Mg			
	SO4			
	Cl			
	Fe			
	Cd			
	Cr			
	Cu			
	Ni			
	Pb			
	Zn			
	Fluorides			
	BTEX			
	PCBs			
	PAHs			
	TDS			
	DOC			
Lagoons Water storage area	pH Suspended solids Visible oil/grease Ammonium N	Annually	In accordance with Agency Guidance LFTGN02 - 'Monitoring of Landfill Leachate, Groundwater and Surface Water'	

(1) Off-site monitoring point

Table S4.6 Groundwater – other monitoring requirements				
Emission point reference or source or description of point of measurement	Parameter	Monitoring frequency	Monitoring standard or method	Other specifications
GW1	Water level PH Ammonium N Cl Cd Ni	Quarterly	In accordance with Agency Guidance LFTGN02 - 'Monitoring of Landfill Leachate, Groundwater and Surface Water'	
	Electrical Conductivity TON TOC Ca Mg Na K Total alkalinity SO4 Fe Mn Cr Cu Pb Zn	Annually		
GW2 GW3(1)	Water level pH	Quarterly	In accordance with Agency Guidance LFTGN02 - 'Monitoring of Landfill Leachate, Groundwater and Surface Water'	
	Electrical Conductivity TON TOC Ca Mg Na K Total alkalinity SO4 Fe Mn Cr Cu Pb Zn	Annually		
(1) Off-site monitoring point				

Schedule 5 - Reporting

Parameters, for which reports shall be made, in accordance with conditions of this permit, are listed below.

Table S5.1 Reporting of monitoring data			
Parameter	Emission or monitoring point/reference	Reporting period	Period begins
Emissions to water Parameters as required by condition 3.6.1	Proposed water discharge Point (consent number PRNNF/1274001) located on drawing number RF/SR/06a as Proposed water discharge point.	Every 3 months	05/07/04
Groundwater Parameters as required by condition 3.6.1	GW1, GW2, GW3	Every 3 Months	05/07/04
Landfill gas lateral migration Parameters as required by condition 3.6.1	GW1, GW2, GW3	Every 3 months	05/07/04
Other Landfill gas monitoring Parameters as required by condition 3.6.1	In waste monitoring borehole GAS1	Every 3 months	1 month after each phase completion
Other surface water monitoring Parameters as required by condition 3.6.1	SW1, SW2, SW3, lagoons, water storage area	Every 3 months	05/07/04

Table S5.2: Annual production/treatment	
Surface water and/ or groundwater: Disposed of off site; Disposed of to any onsite effluent treatment plant.	Cubic metres/year

Table S5.3 Reporting forms		
Media/parameter	Reporting Format	Date of Form
Controlled water	Form water 1 or other reporting format to be agreed in writing with the Agency	
Groundwater	Form groundwater 1 or other reporting format to be agreed in writing with the Agency	
Landfill gas	Form Gas 1 or other reporting format to be agreed in writing with the Agency	
Waste Return	Waste Return Form RATS2E	
Landfill topographical surveys and interpretation	Reporting format to be agreed in writing with the Agency	

Schedule 6 - Notification

This page outlines the information that the operator must provide.

Units of measurement used in information supplied under Part A and B requirements shall be appropriate to the circumstances of the emission. Where appropriate, a comparison should be made of actual emissions and authorised emission limits.

If any information is considered commercially confidential, it should be separated from non-confidential information, supplied on a separate sheet and accompanied by an application for commercial confidentiality under the provisions of the PPC Regulations.

Part A

Permit Number	
Name of operator	
Location of Installation	
Time and date of the detection	

(a) Notification requirements for any malfunction, breakdown or failure of equipment or techniques, accident, or fugitive emission which has caused, is causing or may cause significant pollution	
To be notified within 24 hours of detection	
Date and Time of the event	
Reference or description of the location of the event	
Description of where any release into the environment took place	
Substances(s) potentially released	
Best estimate of the quantity or rate of release of substances	
Measures taken, or intended to be taken, to stop any emission	
Description of the failure or accident.	

(b) Notification requirements for the breach of a limit	
To be notified within 24 hours of detection unless otherwise specified below	
Emission point reference/ source	
Parameter(s)	
Limit	
Measured value and uncertainty	
Date and time of monitoring	
Measures taken, or intended to be taken, to stop the emission	

Time periods for notification following detection of a breach of a limit	
Parameter	**Notification period**

(c) Notification requirements for the detection of any significant adverse environmental effect	
To be notified within 24 hours of detection	
Description of where the effect on the environment was detected	
Substances(s) detected	
Concentrations of substances detected	
Date of monitoring/sampling	

Part B to be supplied as soon as practicable

Any more accurate information on the matters for notification under Part A.	
Measures taken, or intended to be taken, to prevent a recurrence of the incident	
Measures taken, or intended to be taken, to rectify, limit or prevent any pollution of the environment which has been or may be caused by the emission	
The dates of any unauthorised emissions from the installation in the preceding 24 months.	

Name*	
Post	
Signature	
Date	

* authorised to sign on behalf of Mick George (Haulage) Limited

Schedule 7 - Interpretation

"*Accident*" means an accident that may result in pollution.

"*Annually*" means once every Year.

"*Application*" means the application for this permit, together with any additional information supplied by the operator as part of the application and any response to a notice served under schedule 4 to the PPC Regulations

"Authorised Officer" means any person authorised by the Agency under section 108(1) of The Environment Act 1995 to exercise, in accordance with the terms of any such authorisation, any power specified in Section 108(4) of that Act.

"*Background concentration*" means such concentration of that substance as is present in:

- For emissions to surface water, the surface water quality up-gradient of the site; or
- For emissions to sewer, the surface water quality up-gradient of the sewage treatment works discharge.
- For emissions of landfill gas, the ground or air outside the site and not attributable to the site

"*Construction Proposals*" means written information, at a level of detail appropriate to the complexity and pollution risk, on the design, specifications of materials selected, stability assessment (where relevant) and the construction quality assurance (CQA) programme in relation to the new cell or Landfill Infrastructure.

"*CQA Validation Report*" means the final "as built" construction and engineering details of the new cell or of the Landfill Infrastructure. It must provide a comprehensive record of the construction and must include, where relevant:

- The results of all testing required by the CQA programme - this must include the records of any failed tests with a written explanation, details of the remedial action taken, referenced to the appropriate secondary testing;
- Plans showing the location of all tests;
- "As-built" plans and sections of the works;
- Copies of the site engineer's daily records;
- Records of any problems or non-compliances and the solution applied;
- Any other site specific information considered relevant to proving the integrity of the new cell or Landfill Infrastructure;
- Validation by a qualified person that all of the construction has been carried out in accordance with the construction proposals.

"*Fugitive emission*" means an emission to air, water or land from the Activities which is not controlled by an emission or background concentration limit.

"*Groundwater Regulations*" means the Groundwater Regulations SI 1998 No. 2746, and words and expressions used in this permit which are also used in the Regulations shall have the same meanings as in those Regulations.

"*Landfill Infrastructure*" means any specified element of the:

- permanent capping;
- temporary capping (i.e. engineered temporary caps not cover materials);
- leachate abstraction systems;
- leachate transfer, treatment and storage systems;
- surface water drainage systems;
- leachate monitoring wells;
- groundwater monitoring boreholes;
- landfill gas monitoring boreholes;
- landfill gas management systems;

within the Site.

"*Landfill Regulations*" means the Landfill (England and Wales) Regulations SI 2002 No. 1559, and words and expressions used in this permit which are also used in the Regulations shall have the same meanings as in those Regulations.

"*Land Protection Guidance*" means Agency guidance "H7 - Guidance on the protection of land under the PPC Regime: Application site report and site protection monitoring programme".

"*Liquids*" means any liquid other than leachate within the engineered landfill containment system.

"*LFTGN 05*" means Environment Agency Guidance for monitoring enclosed landfill gas flares, September 2004.

"*LFTGN 08*" means Environment Agency Guidance for monitoring landfill gas engines, September 2004.

"*New Cell*" means any new cell, part of a cell or other similar new area of the Site where waste deposit is to commence after issue of this permit and can comprise:

- groundwater under-drainage system;
- permanent geophysical leak location system;
- leak detection layer;
- sub-grade;
- barriers;

- liners;
- leachate collection system;
- leachate abstraction system;
- separation bund/layer;
- cell or area surface water drainage system;
- side wall subgrade and containment systems;

for the new cell.

"*No impact*" means that the change made to the construction process will not alter the agreed design criteria, specification or performance.

"notify without delay" or "notified without delay" means that a telephone call can be used, whereas all other reports and notifications must be supplied in writing, either electronically or on paper.

"*PPC Regulations*" means the Pollution, Prevention and Control (England and Wales) Regulations SI 2000 No.1973 and words and expressions used in this permit which are also used in the Regulations have the same meanings as in those Regulations.

"*Quarter*" means a calendar year quarter commencing on 1 January, 1 April, 1 July or 1 October.

"*Relevant person*" and "*relevant conviction*" shall have the meanings given to them in the Environmental Protection Act 1990

"*Review of the Hydrogeological Risk Assessment*" means a written review of the hydrogeological risk assessment included in the Application, together with any other parts of the Application that addressed the requirements of the Groundwater Regulations. The review shall assess whether the activities of disposal or tipping for the purpose of disposal of waste authorised by the permit continue to meet the requirements of the Groundwater Regulations

"*Site Protection and Monitoring Programme*" means a document which meets the requirements for Site Protection and Monitoring Programmes described in the Land Protection Guidance.

"*Technically competent management*" and "*technical competence*" shall have the meanings given to them in the Environmental Protection Act 1990.

"Waste code" means the six digit code referable to a type of waste in accordance with the List of Wastes (England) Regulations 2005, or List of Wastes (Wales) Regulations 2005, as appropriate, and in relation to hazardous waste, includes the asterisk.

"*Year*" means calendar year ending 31 December.

Where a minimum limit is set for any emission parameter, for example pH, reference to exceeding the limit shall mean that the parameter shall not be less than that limit.

Unless otherwise stated, any references in this permit to concentrations of substances in emissions into air means the standards included in Environment Agency Guidance for Monitoring Enclosed Landfill Gas Flares LFTGN 05 or Guidance for Monitoring Landfill Gas Engine Emissions LFTGN 08.

END OF PERMIT

Variation Notice with introductory note

Pollution Prevention and Control (England & Wales) Regulations 2000

Rectory Farm Quarry

Mick George (Haulage) Limited
Rectory Farm Quarry
Titchmarsh Road
Thrapston
Northamptonshire
NN14 4NJ

Variation Notice Number

PP3233XK

Permit number

EP3837LU

Rectory Farm Quarry

Permit Number PP3233SK

Introductory note

This introductory note does not form a part of the permit

The following notice is issued under regulation 17 of The Pollution Prevention and Control (England and Wales) Regulations 2000 (S.I.2000 No. 1973 (as amended) (the Regulations) to vary the conditions of a permit issued under the Regulations to operate an installation. The notice comprises schedule 1 containing conditions to be deleted, schedule 2 conditions to be amended and schedule 3 conditions to be added.

The variation has been initiated at the request of the operator. The effect of this variation is to increase the annual tonnage of waste to be accepted at the installation. There are no substantial changes to the Permit as a result of this variation.

Status Log of the permit		
Detail	Date	Response Date
Application BT9879IY	Duly made 28/04/03	
Additional Information received	Request dated 29/08/03	Response dated 24/09/03
	Request dated 20/10/03	Response dated 23/10/03
		Response dated 27/10/03
		Response dated 31/10/03
		Response dated 21/11/03
Permit determined	05/07/04	
Variation notice EP3837LU issued	17/10/06	
Variation notice PP3233XK issued	11/01/08	

Other existing Licences/Authorisations/Registrations relating to this site		
Holder	Reference Number	Date of issue
Mick George (Haulage)Ltd	PRNNF/12740 01 (Discharge consent)	08/07/02

End of Introductory Note

Variation Notice

Permit number

BT9879IY

Variation number

PP3233XK

The Environment Agency (the Agency) in exercise of its powers under Regulation 17 of the Pollution Prevention and Control (England and Wales) Regulations 2000 (SI 2000 No 1973) hereby varies the permit held by you

Mick George (Haulage) Limited ("the operator"),

whose registered office is
Second Drove
Meadow Lane
St Ives
Cambridgeshire PE17 4YQ

company registration number 2417831

to operate an installation at
Rectory Farm Quarry
Titchmarsh Road
Thrapston
Northamptonshire NN14 4NJ

to the extent set out in schedules 1 to 3 of this variation notice.

The notice shall take effect from 11 January 2008

Signed	Date
	11/01/2008

Andy Baxendale Area Manager (Northern)

Authorised to sign on behalf of the Agency

SCHEDULE 1 – CONDITIONS TO BE DELETED

1. All conditions and schedules are deleted

SCHEDULE 2 – CONDITIONS TO BE AMENDED

2. None

SCHEDULE 3 – CONDITIONS TO BE ADDED

3. The following conditions are added to the permit

Conditions

1. Management

1.1 General management

1.1.1 The Activities shall be managed and operated:

(a) in accordance with a management system, which identifies and minimises risks of pollution, including those arising from operations, maintenance, accidents, incidents and non-conformances and those drawn to the attention of the operator as a result of complaints; and

(b) by sufficient persons who are competent in respect of the responsibilities to be undertaken by them in connection with the operation of the Activities.

1.1.2 Records demonstrating compliance with condition 1.1.1 shall be maintained.

1.1.3 Any person having duties that are or may be affected by the matters set out in this permit shall have convenient access to a copy of it kept at or near the place where those duties are carried out.

1.2 Accidents that may cause pollution

1.2.1 The operator shall:

(a) maintain and implement an accident management plan;

(b) review and record at least every 4 years or as soon as practicable after an accident, (whichever is the earlier) whether changes to the plan should be made;

(c) make any appropriate changes to the plan identified by a review.

1.3 Finance

1.3.1 The financial provision for meeting the obligations under this permit set out in the agreement made between the operator and the Agency dated 5th July 2004 shall be maintained by the operator throughout the subsistence of this permit and the operator shall produce evidence of such provision whenever required by the Agency.

1.3.2 The operator shall ensure that the charges it makes for the disposal of waste in the landfill cover the cost of operating the landfill, as far as possible the cost of the financial provision required by condition 1.3.1 and thus the estimated costs for the closure and aftercare of the landfill.

1.4 Site security

1.4.1 Site security measures shall prevent unauthorised access to the site, as far as practicable.

2. Operations

Permitted activities

2.1.1 The operator is authorised to carry out the activities specified in schedule 1 table S1.1 (the "Activities").

2.2 The site

2.2.1 The Activities shall not extend beyond the Site, being the land shown edged in red on the site plan at schedule 2 to this permit.

2.3 Operating techniques

2.3.1 The Activities shall, subject to the conditions of this permit, be operated using the techniques and in the manner described in the documentation specified in schedule 1 table S1.2, unless otherwise agreed in writing by the Agency.

2.4 Off-site conditions

2.4.1 The operator shall, unless otherwise agreed in writing by the Agency, undertake monitoring for the parameters, at the locations and at not less than the frequencies specified, in the following tables in schedule 4 to this permit

(a) surface water specified in table S4.5

(b) groundwater specified in table S4.2 and S4.6

(c) landfill gas specified in table S4.3

2.5 Improvement programme

2.5.1 The operator shall complete the improvements specified in schedule 1 table S1.3 by the date specified in that table unless otherwise agreed in writing by the Agency.

2.6 Pre-operational conditions

There are no pre-operational conditions in this permit.

2.7 Engineering

2.7.1 No construction of any new cell shall commence until the operator has submitted construction proposals and the Agency has confirmed that it is satisfied with the construction proposals.

2.7.2 The construction of a new cell shall take place only in accordance with the approved construction proposals unless:

(a) any change to the approved construction proposals would have no impact on the performance of any element of the design; or

(b) a change has otherwise been agreed in writing by the Agency.

2.7.3 No disposal of waste shall take place in a new cell until the operator has submitted a CQA Validation Report and the Agency has confirmed that it is satisfied with the CQA Validation Report.

2.7.4 No construction of landfill Infrastructure shall commence until the operator has submitted relevant construction proposals or a written request to use previous construction proposals and the Agency has confirmed that it is satisfied with the construction proposals.

2.7.5 The construction of the Landfill Infrastructure shall take place only in accordance with the approved construction proposals unless:

(a) any change to the approved construction proposals would have no impact on the performance of any element of the design; or

(b) a change has otherwise been agreed in writing by the Agency.

2.7.6 The operator shall submit a CQA Validation Report as soon as practicable following the construction of the relevant Landfill Infrastructure.

2.7.7 Where pollution controls are immediately necessary to prevent an incident or accident, then conditions 2.7.4 and 2.7.5 do not apply and the relevant Landfill Infrastructure may be constructed, provided that the construction proposals are submitted to the Agency as soon as practicable.

2.7.8 For the purposes of conditions 2.7.1, 2.7.3 and 2.7.4, the Agency shall be deemed to be satisfied where it has not, within the period of 4 weeks from the date of receipt of the relevant construction proposals or CQA Validation Report, either:

(a) confirmed whether or not it is satisfied; or

(b) informed the operator that it requires further information.

2.8 Waste acceptance

2.8.1 Wastes shall only be accepted for disposal if:

(a) they are listed in schedule 3, and

(b) they are inert waste, and

(c) they are not liquid waste (including waste waters but excluding sludge), and

(d) all the relevant waste acceptance procedures set out in schedule 1 of the Landfill Regulations have been completed, and

(e) they fulfil the relevant waste acceptance criteria, and

(f) they have not been diluted or mixed solely to meet the relevant waste acceptance criteria, and

(g) they are wastes which have been treated, except for wastes for which treatment is not technically feasible.

2.8.2 The operator shall visually inspect:

(a) without unloading it, waste that is not in an enclosed container or enclosed vehicle on arrival at the landfill; and

(b) waste at the point of deposit;

and shall satisfy itself that it conforms to the basic characterisation documentation submitted by the holder.

2.8.3 Where the operator has taken samples to establish that the waste is in conformity with the documentation submitted by the holder then the samples taken shall be retained for at least one month and results of any analysis for at least two years.

2.8.4 The operator on accepting each delivery of waste shall provide a receipt to the person delivering it.

2.8.5 The total quantity of waste that shall be deposited in the landfill shall be limited by the pre-settlement levels shown on drawing submitted in the Improvement Programme Condition 5.

2.8.6 The quantity of waste that is deposited in the landfill in any year shall not exceed the limits in schedule 1 table S1.5.

2.8.7 The operator shall maintain and implement a system which ensures that a record is made of the quantity, characteristics, date of delivery and, where practicable, origin of any waste that is received for disposal or recovery and of the identity of the producer, or in the case of multiple collection vehicles, of the collector of such waste. Any information regarded by the operator as commercially confidential shall be clearly identified in the record.

2.9 Closure, aftercare and decommissioning

2.9.1 The operator shall maintain and operate the Activities so as to prevent or where that is not practicable, to minimise, any pollution risk on closure and decommissioning.

3. Emissions and monitoring

3.1 Emissions to water, air or land

3.1.1 There shall be no point source emissions to water, air or land except from the sources and emission points listed in schedule 4 tables S4.1 .

3.2 Emissions to groundwater

3.2.1 There shall be no emission from the activities into groundwater of any substance in List I (as defined by the Groundwater Regulations) contrary to those Regulations.

3.2.2 There shall be no emission from the activities into groundwater of any substance in List II (as defined in the Groundwater Regulations) so as to cause pollution (as defined in those Regulations).

3.2.3 The trigger levels for emissions into groundwater for the parameter(s) and monitoring point(s) set out in schedule 4 table S4.2 of shall not be exceeded.

3.2.4 The operator shall submit to the Agency a review of the Hydrogeological Risk Assessment:

(a) between 9 and 6 months prior to the fourth anniversary of the granting of the permit, and

(b) between 9 and 6 months prior to every subsequent 4 years after the fourth anniversary of the granting of the permit.

3.3 Fugitive emissions of substances

3.3.1 Fugitive emissions of substances (excluding odour, noise and vibration) shall not cause pollution. The operator shall not be taken to have breached this condition if appropriate measures have been taken to prevent or where that is not practicable, to minimise, those emissions.

3.3.2 Litter or mud arising from the activities shall not cause pollution. The operator shall not be taken to have breached this condition if appropriate measures have been used to prevent or where that is not practicable to minimise, the litter and mud.

3.3.3 Litter or mud arising from the activities shall be cleared from affected areas outside the Site as soon as practicable.

3.3.4 All liquids, whose emission to water or land could cause pollution, shall be provided with secondary containment, unless the operator has used other appropriate measures to prevent or where that is not practicable, to minimise, leakage and spillage from the primary container.

3.3.5 The limits for landfill gas set out in schedule 4, table S4.3, shall not be exceeded.

3.4 Odour

3.4.1 Emissions from the activities shall be free from odour at levels likely to cause annoyance outside the Site, as perceived by an authorised officer of the Agency, unless the operator has used appropriate measures to prevent or where that is not practicable to minimise the odour.

3.5 Noise and vibration

3.5.1 Emissions from the Activities shall be free from noise and vibration at levels likely to cause annoyance outside the site, as perceived by an authorised officer of the Agency, unless the operator has used appropriate measures to prevent or where that is not practicable to minimise the noise and vibration.

3.6 Monitoring

3.6.1 The operator shall, unless otherwise agreed in writing by the Agency, undertake the monitoring for the parameters, specified in the following tables in schedule 4 to this permit:

(a) Point source emissions specified in tables S4.1;

(b) Groundwater specified in tables S4.2 and S4.6;

(c) Landfill gas specified in tables S4.3 and S4.4;

(d) Surface water specified in table S4.5

3.6.2 The operator shall maintain records of all monitoring required by this permit including records of the taking and analysis of samples, instrument measurements (periodic and continual), calibrations, examinations, tests and surveys and any assessment or evaluation made on the basis of such data.

3.6.3 A topographical survey of the site referenced to Ordnance Datum shall be carried out:

(a) annually, and

(b) prior to the disposal of waste in any new cell or new development area of the landfill, and

(c) following closure of the landfill or part of the landfill.

The topographical survey shall be used to produce a plan of a scale adequate to show the surveyed features of the site.

3.7 Transfers off-site

3.7.1 Records of all the wastes sent off site from the activities, for either disposal or recovery, shall be maintained.

4. Information

4.1 Records

4.1.1 All records required to be made by this permit shall:

(a) be legible;

(b) be made as soon as reasonably practicable;

(c) if amended, be amended in such a way that the original and any subsequent amendments remain legible, or are capable of retrieval; and

(d) be retained, unless otherwise agreed in writing by the Agency, for at least 6 years from the date when the records were made, or in the case of the following records until permit surrender:

(i) the results of groundwater monitoring;

(ii) sub-surface landfill gas monitoring;

(iii) waste types and quantities;

(iv) topographical surveys; and

(v) the specification and as built drawings of the basal, sidewall and capping engineering systems

4.1.2. Any records required to be made by this permit shall be supplied to the Agency within 14 days where the records have been requested in writing by the Agency.

4.1.3. All records required to be held by this permit shall be held on the site and shall be available for inspection by the Agency at any reasonable time.

4.2 Reporting

4.2.1 A report or reports on the performance of the activities over the previous year shall be submitted to the Agency by 31 January (or other date agreed in writing by the Agency) each year. The report(s) shall include as a minimum:

(a) a review of the results of the monitoring and assessment carried out in accordance with this permit against the relevant assumptions, parameters and results in the risk assessments submitted with the Application;

(b) where the operator's management system encompasses annual improvement targets, a summary report of the previous year's progress against such targets;

(c) the annual production/treatment set out in schedule 5 table S5.2.

(d) details of any contamination or decontamination of the site which has occurred;

(e) the topographical surveys required by condition 3.6.3 other than those submitted as part of a CQA validation report;

(f) the volumetric difference (reported in cubic metres) between the most recent topographical survey and the previous annual topographical survey i.e. the additional volume of the landfill void that is occupied by waste;

(g) an assessment of the settlement behavior of the landfill body based on the difference between the most recent topographical survey and previous annual topographical survey for the areas of the landfill which did not receive waste between the surveys;

(h) a calculation of the remaining capacity (reported in cubic metres) derived from the pre-settlement contours and the most recent topographical survey;

(i) the compliance testing undertaken in the period;

4.2.2 Within 28 days of the end of the reporting period the operator shall, unless otherwise agreed in writing by the Agency, submit reports of the monitoring and assessment carried out in accordance with the conditions of this permit, as follows:

(a) in respect of the parameters and emission points specified in schedule 5 table S5.1;

(b) for the reporting periods specified in schedule 5 table S5.1 and using the forms specified in schedule 5 table S5.3; and

(c) giving the information from such results and assessments as may be required by the forms specified in those tables.

4.2.3 A summary report of the waste types and quantities accepted and removed from the site shall be made for each quarter. It shall be submitted to the Agency within one month of the end of the quarter and shall be in the format required by the Agency.

4.2.4 The operator shall, unless notice under this condition has been served within the preceding 4 years, submit to the Agency, within 6 months of receipt of a written notice, a report assessing whether there are other appropriate measures that could be taken to prevent, or where that is not practicable, to minimise pollution.

4.2.5 All reports and notifications required by the permit shall be sent to the Agency using the contact details supplied in writing by the Agency

4.3 Notifications

4.3.1 The Agency shall be notified without delay following the detection of:

(a) any malfunction, breakdown or failure of equipment or techniques, accident, or fugitive emission which has caused, is causing or may cause significant pollution;

(b) the breach of a limit specified in the permit;

(c) any significant adverse environmental effects.

4.3.2 Any information provided under condition 4.3.1 shall be confirmed by sending the information listed in schedule 6 to this permit within the time period specified in that schedule.

4.3.3. Prior written notification shall be given to the Agency of the following events and in the specified timescales:

(a) as soon as practicable prior to the permanent cessation of any of the permitted activities;

(b) as soon as practicable prior to the cessation of the landfill disposal activities, for a period likely to exceed 1 month; and

(c) at least 7 days prior to the resumption of the landfill disposal activities after a cessation notified under (b) above.

4.3.5 Where the Agency has requested in writing that it shall be notified when the operator is to undertake monitoring and/or spot sampling, the operator shall inform the Agency when the relevant monitoring is to take place. The operator shall provide this information to the Agency at least 14 days before the date the monitoring is to be undertaken.

4.3.6 The Agency shall be notified within 7 days of any changes in technically competent management and the name of any incoming person together with evidence that such person has the required technical competence.

4.3.7 The Agency shall be provided, within 14 days of the operator or any relevant person being convicted of a relevant offence, (unless such information has already been notified to the Agency), with details of the nature of the offence, the place and date of conviction, and the sentence imposed.

4.3.8 The Agency shall be notified within 14 days of the operator and/or any relevant person lodging an appeal against a conviction for any relevant offence and of the outcome when the appeal is decided.

4.3.9 The Agency shall be notified within 14 days of the occurrence of the following matters, except where such disclosure is prohibited by Stock Exchange rules:

(a) any change in the operator's trading name, registered name or registered office address;

(b) any change to particulars of the operator's ultimate holding company (including details of an ultimate holding company where an operator has become a subsidiary); and

(c) any steps taken with a view to the operator going into administration, entering into a company voluntary arrangement or being wound up.

4.4 Interpretation

4.4.1 In this permit the expressions listed in schedule 7 shall have the meaning given in that schedule.

Schedule 1 - Operations

Table S1.1 Activities		
Activity listed in schedule 1 of the PPC Regulations	Description of specified activity	Limits of specified activity
Section 5.2 Part A (1) (b), The disposal of waste in a landfill.	Landfill for inert waste (landfill classification under the Landfill Regulations 2002)	Receipt, handling, storage and disposal of wastes, consisting of the types and quantities specified in conditions 2.8, as an integral part of landfilling.
Directly Associated Activity		
Water discharges to controlled waters.	Discharges of site drainage from the landfill.	From surface water management system to point of entry to controlled waters.

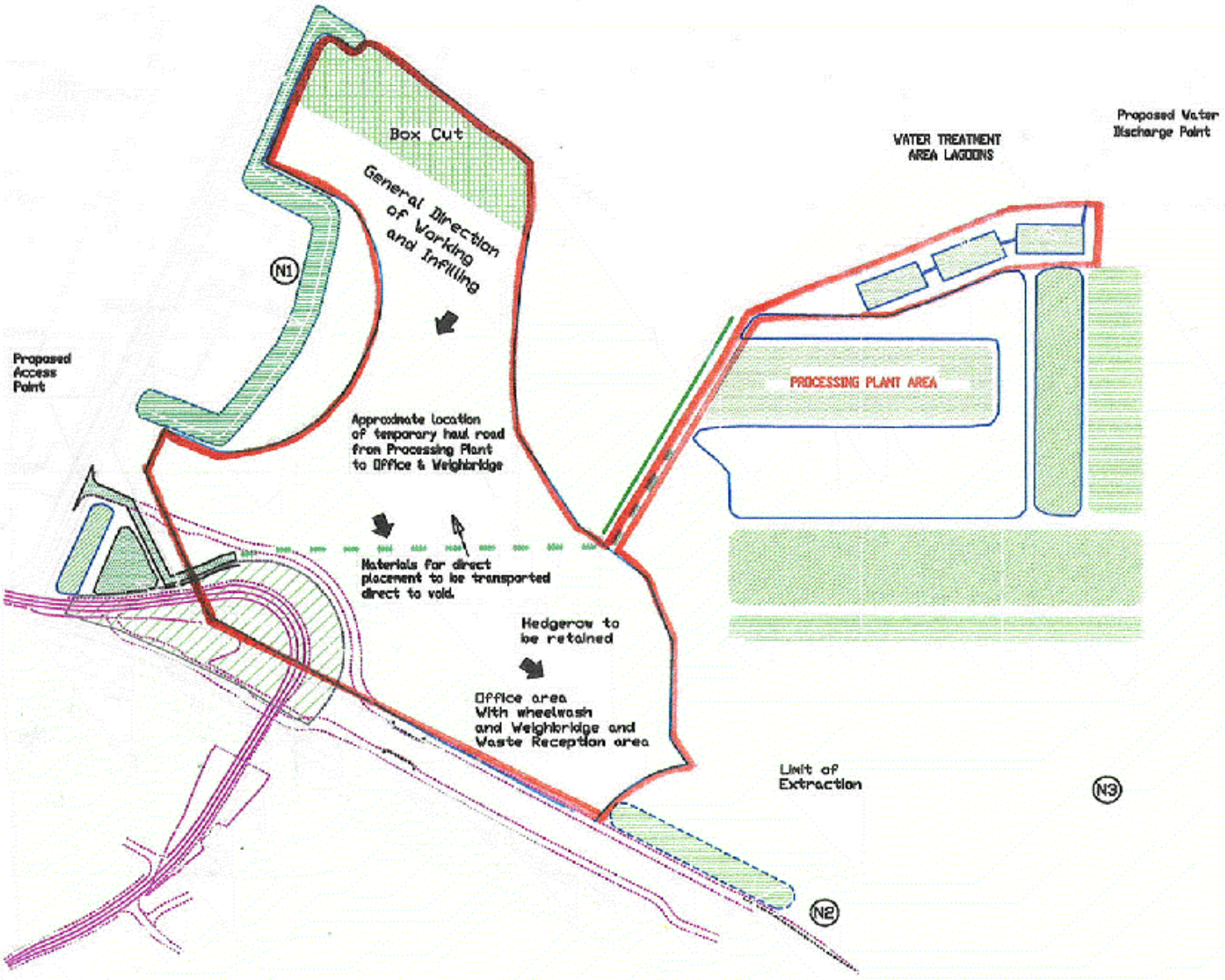
Table S1.2: Operating techniques		
Description	Parts	Date Received
Application	The response to questions 1.1-1.3, 2.1-2.12 in part B of the application form version 2 November 2000 and given in Volume I, II III and IV of the application (excluding the response to questions 1.1-1.3, 2.1-2.12 in part B of the application form version 2 November 2000 and given in Volume I,II,III and IV of the application)	28/04/2003
Response to letter dated 29/08/03	The response to letter dated 29/08/03 is given in letter dated 24/09/03 REF: DW-T2/4	24/09/2003
Response to schedule 4 Notice dated 29/08/2003	Response to questions 0.1 , 1.1.1-1.1.5, 1.1.10-1.1.15, 1.1.27-1.1.32, 1.2.28-1.2.29, 2.1.1, 2.2.1, 2.2.6, 2.2.8, 2.3.16, 2.3.34, 2.3.42, 2.3.48, 2.3.63, 2.3.67-2.3.68, 2.3.70-2.3.71, 2.3.85, 2.4.1, 2.4.4, 4.1.1-4.1.2, 4.3.4, of the schedule 4 notice dated 29/08/2003 given in appendices 1- 24 and volumes I - V replaces questions1.1- 1.3 and 2.1- 2.12 in part B of the application form version 2 November 2000 and with supporting information given in Volume I , II, III and IV .	24/09/2003
Response to letter dated 20/10/2003	The response to question 1.1.1 of the letter dated 20/10/03 ref: BT9879 given in plan reference number RF/REC/01a dated Oct 2003 replaces plan reference RF/SR/01 given in response to question 1.1.1 of the schedule 4 notice dated Sept 2003	23/10/2003
Response to letter dated 20/10/2003	Response to question 1.1.27 and 1.1.30 of the letter dated 20/10/03 ref:BT9879 given in plans referenced RF/GEO/02c Oct 2003 and RF/SR/06a Oct 2003 replaces Plans reference RF/SR/06 dated Sept 03 and RF/GEO/02a dated Sept 2003 in response to questions 1.1.27 and 1.1.30 of the schedule 4 notice dated 29/08/03	23/10/2003
Response to letter dated 20/10/2003	Response to question 1.1.31 of the letter dated 20/10/2003 ref:BT9879 given in letter dated 23/10/2003 ref:DW/SB-T2/4 supplements the response to question 1.1.31 of the schedule 4 notice dated 29/08/03 given in appendix 12 .	23/10/2003
Response to the letter dated 20/10/2003	Response to question 2.4.1 of the letter dated 20/10/2003 given in amended Appendix F of appendix 23 replaces the response to the schedule 4 notice dated 29/08/03 given in appendix F of appendix 23.	23/10/2003
Response to letter dated 20/10/2003	Response to questions 2.2.1 and 2.2.8 of the letter dated 20/10/2003 given in the document entitled Rectory Farm Waste Acceptance Criteria and Procedures-Rev A dated Oct 2003 replaces the response to questions 2.2.1 and 2.2.8 of the schedule 4 notice dated 29/08/03 given in appendix 14	27/10/2003
Response to letter dated 20/10/2003	Response to question 2.3.34 of the letter dated 20/10/2003 given in the letter dated 27/10/2003 REF: DW/JB-T2/4 supplements the response to question 2.3.34 of the schedule 4 notice dated 29/08/03.	27/10/2003

Table S1.2: Operating techniques		
Description	Parts	Date Received
Response to letter dated 20/10/2003	Response to question 2.3.48 of the letter dated 20/10/2003 given in Gas Monitoring Action Plan Rev A dated Oct 2003 and the amended questions 2.3.48 and 2.3.49 of Part B of the application form replaces the response given to question 2.3.48 of the schedule 4 notice dated 29/08/03 and questions 2.3.48 and 2.3.49 of Part B of the application form submitted in response to question 0.1 of the schedule 4 notice dated 29/08/03	27/10/2003
Response to letter dated 20/10/2003	Response to question 2.4.1 of the letter dated 20/10/2003 given in the letter dated 27/10/03 Ref:DW/JB-T2/4 replaces the response given to question 2.4.1 of the schedule 4 notice dated 29/08/03 in question 2.4.1 of part B of the application form submitted in response to question 0.1 of the schedule 4 notice dated 29/08/03.	27/10/2003
Response to letter dated 20/10/2003	Response to question 1.1.12 of the letter dated 20/10/2003 given in the letter dated 31/10/2003 REF: DW/JB-T2/4 in section 1. Question 2.1.12 supplements the response given to question 1.1.12 of the schedule 4 notice dated 29/08/03 given in appendix 24	31/10/2003
Schedule 4 notice dated 29/08/2003	Response to question 1.1.31 of the schedule 4 notice dated 29/08/2003 given in the letter dated 21/11/03 REF: DW/JB-T2/4 supplements the response given to question 1.1.31 of the schedule 4 notice dated 29/08/03 given in appendix 12	21/11/2003
E-mail from Dan Walker Marwalk Developments Limited dated 01/03/04 ref:DW-T2/4	Information in e-mail supplements information contained in appendix 15 of the schedule 4 notice response dated 29/08/03	01/03/2004
E-mail from Dan Walker Marwalk Developments Limited dated 08/04/04	Information in e-mail on groundwater monitoring suite supplements information contained in the schedule 4 notice response dated 29/08/03	08/04/04
Application	The response to questions 2.11 In Part B of the application form version 2 November 2000 and given in volume III and volume IV of the supporting information (excluding the response given to question 2.11 in part B of the application form version 2 November 2000 and given in volume III and IV of the supporting information.)	28/04/2003
Response to Schedule 4 Notice Dated 29/08/2003	Response to question 0.1 of the schedule 4 notice dated 29/08/2003 given in appendix 2 in question 2.5 of the application form dated December 2002, restoration concept plan reference RF/WP/03a within appendix 3 and improvement conditions 1, 2 and 3 replaces the response given to questions 2.11 in part B of the application form version 2 November 2000 and given in Volume III and volume IV of the supporting information.	24/09/2003

Table S1.3 Improvement programme requirements		
Reference	Requirement	Date
IC 1	A permitted installation closure plan shall be produced in consultation with the Agency and in accordance with council directive 1999/31/EC on the Landfill of Waste (26 April 1999). It shall specify the detailed procedure the operator proposes to implement upon the closure of the permitted landfill. The closure plan will be subject to approval by the Agency in writing and shall not be considered accepted or acceptable until such approval is given.	31/03/09
IC 2	A permitted installation post-closure aftercare and restoration plan shall be produced in consultation with the Agency in accordance with council directive 1999/31/EC on the landfill of waste (26 April 1999). It shall specify the detailed procedures the operator proposes to implement upon the permitted landfill being considered by the Agency to be in post closure and after care phase of its operations. The plan will be subject to approval by the Agency in writing and shall not be considered accepted or acceptable until such approval is given.	31/03/09
IC 3	A permitted installation decommissioning plan prior to surrender shall be produced in consultation with the Agency and in accordance with council directive 1999/31/EC on the landfill of waste (26 April 1999). It shall specify the detailed procedures the operator proposes to implement upon the Permitted installation being considered by the Agency to be suitable to decommission prior to surrender. The plan will be subject to approval by the Agency in writing and shall not be considered accepted or acceptable until such approval is given.	31/03/09
IC 4	Proposals for the location of the additional in waste boreholes for the monitoring of landfill gas to be retrofitted shall be submitted to the Agency and will be subjected to approval by the Agency in writing and shall not be considered accepted or acceptable until such approval is given.	1 month after each phase completion
IC 5	A drawing showing the pre-settlement levels of the landfill shall be submitted to the Agency for approval. The total quantity of waste that shall be deposited in the landfill shall be limited by the pre-settlement levels shown in the drawing as required in Condition 2.8.5.	31/12/06

Table S1.5 Annual Waste Input Limits	
Category	Limit Tonnes/ Year
Inert Waste	300 000

Schedule 2 - Site plan



Schedule 3 - List of permitted wastes

Wastes that may be accepted without testing at a landfill for inert waste

EWC Code	Description	Restrictions
17 01 01	Concrete	Selected C&D waste only[(a)]
17 01 02	Bricks	Selected C&D waste only[(a)]
17 01 03	Tiles and ceramics	Selected C&D waste only[(a)]
17 01 07	Mixtures of concrete, bricks, tiles and ceramics	Selected C&D waste only[(a)]
17 05 04	Soil and stones	Excluding topsoil, peat; excluding soil and stones from contaminated sites

(a) Selected construction and demolition waste (C & D waste): with low contents of other types of materials (like metals, plastic, organics, wood, rubber, etc). The origin of the waste must be known.

No C & D waste from constructions, polluted with inorganic or organic dangerous substances, e.g. because of production processes in the construction, soil pollution, storage and usage of pesticides or other dangerous substances, etc., unless it is made clear that the demolished construction was not significantly polluted.

No C & D waste from constructions, treated, covered or painted with materials, containing dangerous substances in significant amounts.

Schedule 4 – Emissions and monitoring

Table S4.1 Point source emissions to water (other than sewer) – emission limits and monitoring requirements						
Emission point Ref. & Location	Parameter	Source	Limit (incl unit)	Reference Period	Monitoring Frequency	Monitoring Standard or Method
Proposed water discharge Point (consent number PRNNF/12740 01) located on drawing number RF/SR/06a as Proposed water discharge point.	pH	Surface water	6-9		Quarterly	In accordance with Agency Guidance LFTGN02 - 'Monitoring of Landfill Leachate, Groundwater and Surface Water'
	Suspended Solids		40 mg/l		Quarterly	
	Visible Oils		None visible		Monthly	
	Ammonium N		1 mg/l		Quarterly	

Table S4.2 Trigger levels for emissions into groundwater and monitoring requirements					
Monitoring point reference(1)	Parameter	Limit (including unit)	Reference Period	Monitoring frequency	Monitoring standard or method
GW2 GW3(2)	Cadmium	0.1 ug/l		Quarterly	In accordance with Agency Guidance LFTGN02 - 'Monitoring of Landfill Leachate, Groundwater and Surface Water'
	Chloride	250 mg/l			
	Ammonium N	1 mg/l			
	Nickel	20 ug/l			

(1) Identified on drawing number RF/Geo/02c dated Oct 2003

(2) Off-site monitoring point

Table S4.3 Landfill gas in external monitoring boreholes – limits and monitoring requirements				
Monitoring point Ref. /description(1)	Parameter	Limit (including units)	Monitoring frequency	Monitoring standard or method
GW1 GW2 GW3(2)	Methane	1 %v/v	Quarterly	In accordance with Agency Guidance LFTGN03 – 'Guidance on the Management of Landfill Gas'
	Carbon Dioxide	1.5 %v/v		
	Oxygen	no limit		
	Atmospheric pressure	no limit		
	Temperature	no limit		
	Meteorological data	no limit		

(1) Identified on drawing number RF/Geo/02c dated Oct 2003

(2) Off-site monitoring point

Table S4.4 Landfill gas – other monitoring requirements				
Emission point reference or source or description of point of measurement	Parameter	Monitoring frequency	Monitoring standard or method	Other specifications
In waste monitoring borehole GAS1	Methane Carbon Dioxide Oxygen Atmospheric pressure Differential pressure (Note 1) Temperature Meteorological Data.	Quarterly	In accordance with Agency Guidance LFTGN03 – 'Guidance on the Management of Landfill Gas'	

Note 1 Differential pressure monitoring only to be undertaken in the event of methane and/or carbon dioxide trigger level breaches.

Table S4.5 Surface water – other monitoring requirements				
Emission point reference or source or description of point of measurement	Parameter	Monitoring frequency	Monitoring standard or method	Other specifications

Table S4.5 Surface water – other monitoring requirements				
Emission point reference or source or description of point of measurement	Parameter	Monitoring frequency	Monitoring standard or method	Other specifications
SW1 SW2(1) SW3(1)	pH Suspended solids Ammonium N	Quarterly	In accordance with Agency Guidance LFTGN02 - 'Monitoring of Landfill Leachate, Groundwater and Surface Water'	
	Visible oil/grease	Monthly		
	TOC	Annually		
	Se			
	Sb			
	Hg			
	Al			
	Mg			
	SO4			
	Cl			
	Fe			
	Cd			
	Cr			
	Cu			
	Ni			
	Pb			
	Zn			
	Fluorides			
	BTEX			
	PCBs			
	PAHs			
	TDS			
	DOC			
Lagoons Water storage area	pH Suspended solids Visible oil/grease Ammonium N	Annually	In accordance with Agency Guidance LFTGN02 - 'Monitoring of Landfill Leachate, Groundwater and Surface Water'	
(1) Off-site monitoring point				

Table S4.6 Groundwater – other monitoring requirements				
Emission point reference or source or description of point of measurement	Parameter	Monitoring frequency	Monitoring standard or method	Other specifications
GW1	Water level pH Ammonium N Cl Cd Ni	Quarterly	In accordance with Agency Guidance LFTGN02 - 'Monitoring of Landfill Leachate, Groundwater and Surface Water'	
	Electrical Conductivity TON TOC Ca Mg Na K Total alkalinity SO4 Fe Mn Cr Cu Pb Zn	Annually		
GW2 GW3(1)	Water level pH	Quarterly	In accordance with Agency Guidance LFTGN02 - 'Monitoring of Landfill Leachate, Groundwater and Surface Water'	
	Electrical Conductivity TON TOC Ca Mg Na K Total alkalinity SO4 Fe Mn Cr Cu Pb Zn	Annually		
(1) Off-site monitoring point				

Schedule 5 - Reporting

Parameters, for which reports shall be made, in accordance with conditions of this permit, are listed below.

Table S5.1 Reporting of monitoring data			
Parameter	Emission or monitoring point/reference	Reporting period	Period begins
Emissions to water Parameters as required by condition 3.6.1	Proposed water discharge Point (consent number PRNNF/12740 01) located on drawing number RF/SR/06a as Proposed water discharge point.	Every 3 months	05/07/04
Groundwater Parameters as required by condition 3.6.1	GW1, GW2, GW3	Every 3 Months	05/07/04
Landfill gas lateral migration Parameters as required by condition 3.6.1	GW1, GW2, GW3	Every 3 months	05/07/04
Other Landfill gas monitoring Parameters as required by condition 3.6.1	In waste monitoring borehole GAS1	Every 3 months	1 month after each phase completion
Other surface water monitoring Parameters as required by condition 3.6.1	SW1, SW2, SW3, lagoons, water storage area	Every 3 months	05/07/04

Table S5.2: Annual production/treatment	
Surface water and/ or groundwater: Disposed of off site; Disposed of to any onsite effluent treatment plant.	Cubic metres/year

Table S5.3 Reporting forms		
Media/parameter	Reporting Format	Date of Form
Controlled water	Form water 1 or other reporting format to be agreed in writing with the Agency	
Groundwater	Form groundwater 1 or other reporting format to be agreed in writing with the Agency	
Landfill gas	Form Gas 1 or other reporting format to be agreed in writing with the Agency	
Waste Return	Waste Return Form RATS2E	
Landfill topographical surveys and interpretation	Reporting format to be agreed in writing with the Agency	

Schedule 6 - Notification

This page outlines the information that the operator must provide.

Units of measurement used in information supplied under Part A and B requirements shall be appropriate to the circumstances of the emission. Where appropriate, a comparison should be made of actual emissions and authorised emission limits.

If any information is considered commercially confidential, it should be separated from non-confidential information, supplied on a separate sheet and accompanied by an application for commercial confidentiality under the provisions of the PPC Regulations.

Part A

Permit Number	
Name of operator	
Location of Installation	
Time and date of the detection	

(a) Notification requirements for any malfunction, breakdown or failure of equipment or techniques, accident, or fugitive emission which has caused, is causing or may cause significant pollution	
To be notified within 24 hours of detection	
Date and Time of the event	
Reference or description of the location of the event	
Description of where any release into the environment took place	
Substances(s) potentially released	
Best estimate of the quantity or rate of release of substances	
Measures taken, or intended to be taken, to stop any emission	
Description of the failure or accident.	

(b) Notification requirements for the breach of a limit	
To be notified within 24 hours of detection unless otherwise specified below	
Emission point reference/ source	
Parameter(s)	
Limit	
Measured value and uncertainty	
Date and time of monitoring	
Measures taken, or intended to be taken, to stop the emission	

Time periods for notification following detection of a breach of a limit	
Parameter	**Notification period**

(c) Notification requirements for the detection of any significant adverse environmental effect	
To be notified within 24 hours of detection	
Description of where the effect on the environment was detected	
Substances(s) detected	
Concentrations of substances detected	
Date of monitoring/sampling	

Part B to be supplied as soon as practicable

Any more accurate information on the matters for notification under Part A.	
Measures taken, or intended to be taken, to prevent a recurrence of the incident	
Measures taken, or intended to be taken, to rectify, limit or prevent any pollution of the environment which has been or may be caused by the emission	
The dates of any unauthorised emissions from the installation in the preceding 24 months.	

Name*	
Post	
Signature	
Date	

* authorised to sign on behalf of Mick George (Haulage) Limited

Schedule 7 - Interpretation

"*Accident*" means an accident that may result in pollution.
"*Annually*" means once every Year.
"*Application*" means the application for this permit, together with any additional information supplied by the operator as part of the application and any response to a notice served under schedule 4 to the PPC Regulations
"Authorised Officer" means any person authorised by the Agency under section 108(1) of The Environment Act 1995 to exercise, in accordance with the terms of any such authorisation, any power specified in Section 108(4) of that Act.
"*Background concentration*" means such concentration of that substance as is present in:

- For emissions to surface water, the surface water quality up-gradient of the site; or
- For emissions to sewer, the surface water quality up-gradient of the sewage treatment works discharge.
- For emissions of landfill gas, the ground or air outside the site and not attributable to the site

"*Construction Proposals*" means written information, at a level of detail appropriate to the complexity and pollution risk, on the design, specifications of materials selected, stability assessment (where relevant) and the construction quality assurance (CQA) programme in relation to the new cell or Landfill Infrastructure.
"*CQA Validation Report*" means the final "as built" construction and engineering details of the new cell or of the Landfill Infrastructure. It must provide a comprehensive record of the construction and must include, where relevant:

- The results of all testing required by the CQA programme - this must include the records of any failed tests with a written explanation, details of the remedial action taken, referenced to the appropriate secondary testing;
- Plans showing the location of all tests;
- "As-built" plans and sections of the works;
- Copies of the site engineer's daily records;
- Records of any problems or non-compliances and the solution applied;
- Any other site specific information considered relevant to proving the integrity of the new cell or Landfill Infrastructure;
- Validation by a qualified person that all of the construction has been carried out in accordance with the construction proposals.

"*Fugitive emission*" means an emission to air, water or land from the Activities which is not controlled by an emission or background concentration limit.
"*Groundwater Regulations*" means the Groundwater Regulations SI 1998 No. 2746, and words and expressions used in this permit which are also used in the Regulations shall have the same meanings as in those Regulations.

"*Landfill Infrastructure*" means any specified element of the:

- permanent capping;
- temporary capping (i.e. engineered temporary caps not cover materials);
- leachate abstraction systems;
- leachate transfer, treatment and storage systems;
- surface water drainage systems;
- leachate monitoring wells;
- groundwater monitoring boreholes;
- landfill gas monitoring boreholes;
- landfill gas management systems;

within the Site.
"*Landfill Regulations*" means the Landfill (England and Wales) Regulations SI 2002 No. 1559, and words and expressions used in this permit which are also used in the Regulations shall have the same meanings as in those Regulations.
"*Land Protection Guidance*" means Agency guidance "H7 - Guidance on the protection of land under the PPC Regime: Application site report and site protection monitoring programme".
"*Liquids*" means any liquid other than leachate within the engineered landfill containment system.
"*LFTGN 05*" means Environment Agency Guidance for monitoring enclosed landfill gas flares, September 2004.
"*LFTGN 08*" means Environment Agency Guidance for monitoring landfill gas engines, September 2004.
"*New Cell*" means any new cell, part of a cell or other similar new area of the Site where waste

deposit is to commence after issue of this permit and can comprise:

- groundwater under-drainage system;
- permanent geophysical leak location system;
- leak detection layer;
- sub-grade;
- barriers;
- liners;
- leachate collection system;
- leachate abstraction system;
- separation bund/layer;
- cell or area surface water drainage system;
- side wall subgrade and containment systems;

for the new cell.

"*No impact*" means that the change made to the construction process will not alter the agreed design criteria, specification or performance.

"notify without delay" or "notified without delay" means that a telephone call can be used, whereas all other reports and notifications must be supplied in writing, either electronically or on paper.

"*PPC Regulations*" means the Pollution, Prevention and Control (England and Wales) Regulations SI 2000 No.1973 and words and expressions used in this permit which are also used in the Regulations have the same meanings as in those Regulations.

"*Quarter*" means a calendar year quarter commencing on 1 January, 1 April, 1 July or 1 October.

"*Relevant person*" and "*relevant conviction*" shall have the meanings given to them in the Environmental Protection Act 1990

"*Review of the Hydrogeological Risk Assessment*" means a written review of the hydrogeological risk assessment included in the Application, together with any other parts of the Application that addressed the requirements of the Groundwater Regulations. The review shall assess whether the activities of disposal or tipping for the purpose of disposal of waste authorised by the permit continue to meet the requirements of the Groundwater Regulations

"*Site Protection and Monitoring Programme*" means a document which meets the requirements for Site Protection and Monitoring Programmes described in the Land Protection Guidance.

"*Technically competent management*" and "*technical competence*" shall have the meanings given to them in the Environmental Protection Act 1990.

"Waste code" means the six digit code referable to a type of waste in accordance with the List of Wastes (England) Regulations 2005, or List of Wastes (Wales) Regulations 2005, as appropriate, and in relation to hazardous waste, includes the asterisk.

"*Year*" means calendar year ending 31 December.

Where a minimum limit is set for any emission parameter, for example pH, reference to exceeding the limit shall mean that the parameter shall not be less than that limit.

Unless otherwise stated, any references in this permit to concentrations of substances in emissions into air means the standards included in Environment Agency Guidance for Monitoring Enclosed Landfill Gas Flares LFTGN 05 or Guidance for Monitoring Landfill Gas Engine Emissions LFTGN 08.

END OF PERMIT

Hydrock Summary Table of Information Provided - Ground Gas Monitoring

Date	Sample Point	Temperature	Pressure	Water level	Water Level (m bgl)	CH4	CO2	O2
05/07/2009	GW1	28	1014	54.26		0	1.2	18.2
05/07/2009	GW2	28	1014	39.29		0	1.2	15.6
05/07/2009	GW3	28	1014	39.94		0	1.9	0.3
05/07/2009	Gas1	28	1014	-		0	0.7	20.6
05/11/2021	GW1	-	-		9.86	0.2	0.3	20.3
05/11/2021	GW2	-	-		21.01	0.1	1.4	12.9
05/11/2021	GW3	-	-		8.75	0.1	1.8	2.1
05/11/2021	Gas1	-	-		3.75	8	1	10.5
21/11/2009	GW1	-	-		3.51	0.1	0.2	20.1
21/11/2009	GW2	-	-		9.87	0.2	1.4	12.2
21/11/2009	GW3	-	-		21.18	0.2	2.1	0.1
21/11/2009	Gas1	-	-		8.91	9.8	3.3	9.1
15/09/2009	GW1	-	-	54.71		0	0.3	20.7
15/09/2009	GW2	-	-	39.44		0	0.2	20.7
15/09/2009	GW3	-	-	39.7		0.1	0.4	20.5
01/01/2010	GW1	1	1016		9.77	0	0.3	20.2
01/01/2010	GW2	1	1016		9.1	0	0	21.2
01/01/2010	GW3	1	1016		8.66	0	0.2	21.9
01/01/2010	Gas1	1	1016		-	0	0.2	21.5
31/03/2010	GW1	4	982	-	-	0	0.9	20.1
31/03/2010	GW2	4	983	-	-	0.2	1.1	19.7
31/03/2010	GW3	4	984	-	-	0	0.6	20.2
31/03/2010	Gas1	4	985	-	-	0.5	0.6	19.7
02/06/2010	GW1	22	1023		9.51	0	0.5	19.3
02/06/2010	GW2	22	1023		21.57	0	0.5	19.2
02/06/2010	GW3	22	1023		8.74	0	1.4	0.8
02/06/2010	Gas1	22	1023		-	0	0	20.9
19/09/2010	GW1	15	1012		9.65	0	0.4	20
19/09/2010	GW2	15	1012		21.16	0	1.1	17
19/09/2010	GW3	15	1012		8.73	0	1	2
19/09/2010	Gas1	15	1012			0.8	1	18.2
24/03/2011	GW1	15	1029		9.49	0	0.3	19.6
24/03/2011	GW2	15	1029		21.3	0	0	20.4
24/03/2011	GW3	15	1029		8.75	0	1.2	0.3
24/03/2011	Gas1	15	1029		-	0	0.1	20.6
29/06/2011	GW1	18	1022		10	0	0	21
29/06/2011	GW2	18	1022		21	0	1	17
29/06/2011	GW3	18	1022		9	0	0.9	1
29/06/2011	Gas1	18	1022		-	0	0	20.9
23/09/2011	GW1	11	1018		9.75	0	0	21
23/09/2011	GW2	11	1018		21.34	0	0.8	17
23/09/2011	GW3	11	1018		9.12	0	1.1	2
23/09/2011	Gas1	11	1018		-	0	1.1	19.5
08/12/2011	GW1	11	1004		-	0	0.1	21
08/12/2011	GW2	11	1004		-	0	0.3	20
08/12/2011	GW3	11	1004		-	0	0.8	3
08/12/2011	Gas1	11	1004		-	0	0.5	20.6
15/03/2012	GW1	14	1025		9.68	0	0.7	18.7
15/03/2012	GW2	14	1025		21.25	0	0.1	19.9
15/03/2012	GW3	14	1025		8.87	0	1.2	0.5
15/03/2012	Gas1	14	1025		-	0	0.9	18

06/06/2012	GW1	16	1001		9.43	0.3	0.8	19.1
19/06/2012	GW2	21	1019		21.02	0	0.1	20.8
06/06/2012	GW3	16	1001		8.73	0	0.3	20.4
06/06/2012	Gas1	16	1001		-	0	0.3	20.5
04/09/2012	GW1	25	1028		9.19	0	0.3	20.1
04/09/2012	GW2	25	1028		21.1	0	0.2	20.2
04/09/2012	GW3	25	1028		8.62	0.1	1.4	7.1
04/09/2012	Gas1	25	1028		-	0	0.3	20.3
05/03/2013	GW1	11	1004		8.66	0	1.6	17.2
05/03/2013	GW2	11	1004		21.22	0	0.1	17
05/03/2013	GW3	11	1004		8.42	0	1.4	7.6
05/03/2013	Gas1	11	1004		-	0	0.1	19.4
11/06/2013	GW1	17	1015		9.06	0	0.2	19.3
11/06/2013	GW2	17	1015		21.24	0.1	0.4	18.6
11/06/2013	GW3	17	1015		8.73	0	1.4	3.6
11/06/2013	Gas1	17	1015		-	0	0.8	19.3
04/03/2014	GW1	9	1000		8.67	0	0.1	21
04/03/2014	GW2	9	1000		21.18	0	1	15.3
04/03/2014	GW3	9	1000		8.78	0	0.7	0.1
04/03/2014	Gas1	9	1000		-	0	0	21.3
04/06/2014	GW1	12	1004		8.8	0	0.6	18.7
04/06/2014	GW2	12	1004		21.06	0.1	1.1	16.3
04/06/2014	GW3	12	1004		8.76	0.1	0.4	20.3
04/06/2014	Gas1	12	1004		-	0.1	0.1	20.6
03/09/2014	GW1	12	1026		9.06	0	0.2	20.2
03/09/2014	GW2	12	1026		21.24	0	1.3	16
03/09/2014	GW3	12	1026		8.89	0	0.6	19.1
03/09/2014	Gas1	12	1026		-	0	0.9	20
02/12/2014	GW1	6	1018		-	0	0	20.5
02/12/2014	GW2	6	1018		-	0	1.3	14.1
02/12/2014	GW3	6	1018		-	0	0.9	19.6
02/12/2014	Gas1	6	1018		-	0	0.3	21
30/03/2016	GW1	7	1009		9.12	0	0.4	18.7
30/03/2016	GW2	7	1009		2.07	0	1.14	15.3
30/03/2016	GW3	7	1009		8.54	0	1.2	3.5
30/03/2016	Gas1	7	1009		-	0	0.2	21.1
22/02/2016	GW1	13	1014		9.17	0	1.1	19
22/02/2016	GW2	13	1014		2.88	0	1.2	78.2
22/02/2016	GW3	13	1014		8.76	0	0.9	20.5
22/02/2016	Gas1	13	1014		-	0	0.8	20.9
05/09/2016	GW1	17	1020		9.24	0	0.1	19.7
05/09/2016	GW2	17	1020		2.91	0	0.3	20
05/09/2016	GW3	17	1020		-	0	1	19.5
05/09/2016	Gas1	17	1020		-	0	0.8	19.3
15/12/2016	GW1	12	1018					
15/12/2016	GW2	12	1018			0	1.2	15.8
15/12/2016	GW3	12	1018					
15/12/2016	Gas1	12	1018			0	0.4	20.8
21/03/2018	GW1	10	1012		0	0	0.2	19.5
21/03/2018	GW2	10	1012		1.22	0	0.8	17.7
21/03/2018	GW3	10	1012		Destroyed	-	-	-
21/03/2018	Gas1	10	1012		-	0	0.1	20.8

18/03/2020	GW1	11	1023		0.26	0	0.1	20.5
18/03/2020	GW2	11	1023		0.74	0	0.1	20.6
18/03/2020	GW3	11	1023		Destroyed	-	-	-
18/03/2020	Gas1	11	1023		-	-	-	-
04/05/2020	GW1	12	1009		9.02	0	0.3	20.3
04/05/2020	GW2	12	1009		1.54	0	0.1	20.5
04/05/2020	GW3	12	1009		Destroyed	-	-	-
04/05/2020	Gas1	12	1009		-	-	-	-
15/09/2020	GW1	24	1018	65.02		0	0.1	20.4
15/09/2020	GW2	24	1018	60.64		0	0.2	20.4
15/09/2020	GW3	24	1018		Destroyed	-	-	-
15/09/2020	Gas1	24	1018		-	-	-	-
02/12/2020	GW1	4	1020		9.08	0	0.1	20.5
02/12/2020	GW2	4	1020		0.5	0	0.1	20.6
02/12/2020	GW3	4	1020		Destroyed	-	-	-
02/12/2020	Gas1	4	1020		-	-	-	-
09/03/2021	GW1	11	1017			0	0.1	20.6
09/03/2021	GW2	11	1017			0	0.1	20.5
09/03/2021	GW3	11	1017		Destroyed	-	-	-
09/03/2021	Gas1	11	1017		-	-	-	-
31/03/2021	BH1	11	1017			0	1.3	19.1
31/03/2021	BH2	11	1017			0	0.7	19.5
31/03/2021	BH3	11	1017			0	0.5	20.1
31/03/2021	BH4	11	1017			0	1.3	19.1
31/03/2021	BH5	11	1017			0.1	0.2	21
31/03/2021	BH6	11	1017			0	0.9	18.4
31/03/2021	BH7	11	1017			0	0.5	19.1
31/03/2021	BH8	11	1017			0	1.6	17.5
31/03/2021	BH9	11	1017			0.1	1.1	18.4
31/03/2021	BH10	11	1017			0	0.9	19.4
31/03/2021	BH11	11	1017			0	2.7	11.5
31/03/2021	BH12	11	1017			0	1.3	17.5
31/03/2021	BH13	11	1017			0	0.7	18.6
31/03/2021	BH14	11	1017			0	0.3	20.4

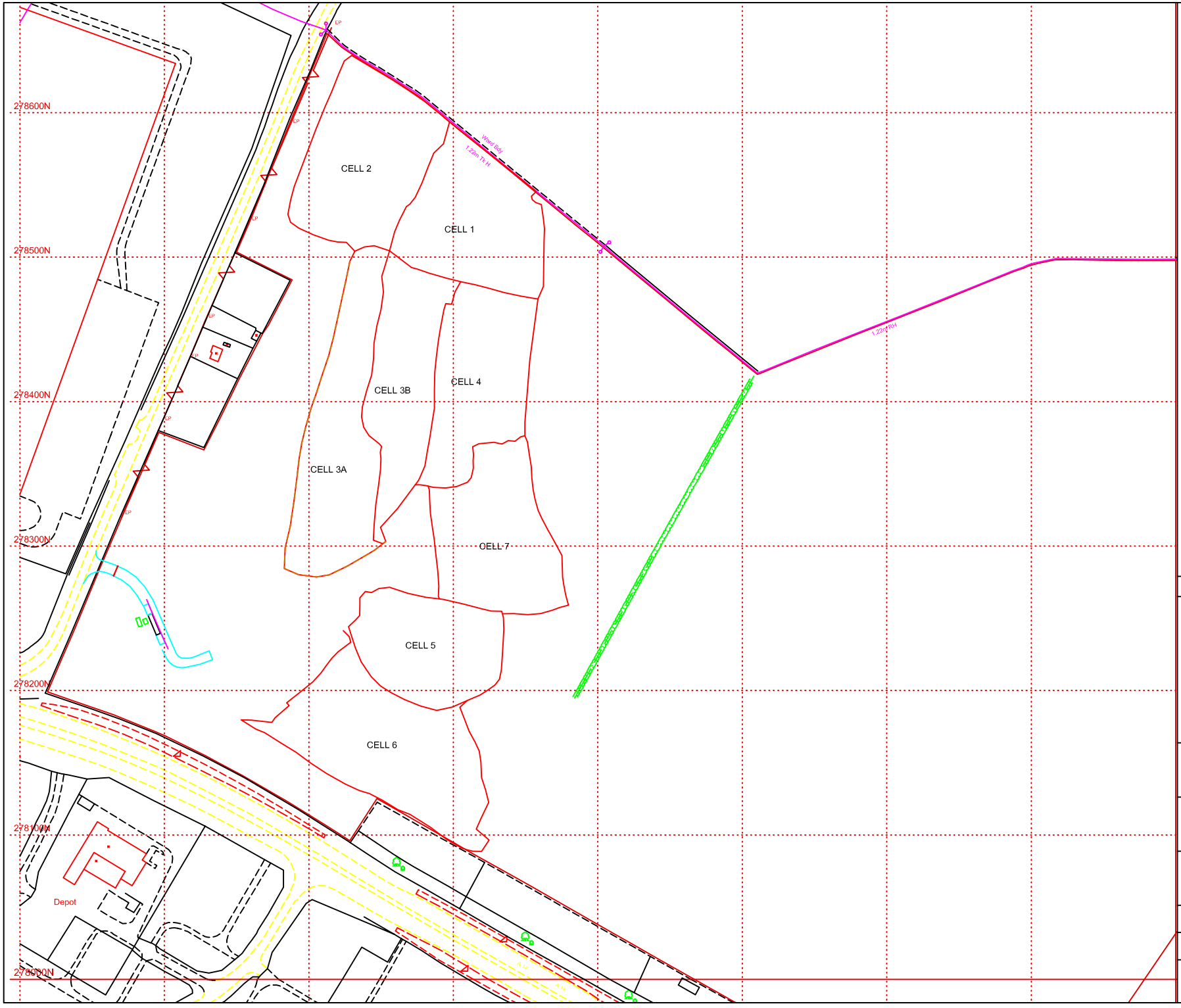
Hydrock Summary Table of Information Provided - Groundwater Testing

Date	Sample Po	Sample Ty	Temperat	Dissolved oxygen	COD	Cadmium	Chloride	Ammonium N	Nickel	Water leve	pH	Electrical C	TON	TOC	Calcium	Magnesiur	Sodium	Potassium	Total Alkal	Sulphate	Iron	Manganese	Chromium	Copper	Lead	Zinc
31/07/2007	GW1	G	8.6	15.4	13.2	<0.3	67.4	0.95	<0.7		8.2	765.0	7.38	2.03	140	6.59	34.6	5.33	210	110	0.02	0.009	<0.8	13.2	1.3	6.7
31/07/2007	GW2	G	8.1	13.5	13.9	<0.3	69	0.03	<0.7		8.2	771	7.43	2.37	141	6.55	35.9	5.21	209	111	0.23	0.009	<0.8	2	<0.6	2.9
31/07/2007	GW3	G	7.7	10.5	20.9	<0.3	58.2	0.04	<0.7		8.1	531	<0.1	4.74	79.9	6.26	31.2	6.25	115	95.5	0.038	<0.003	<0.8	19.7	0.8	4.7
07/12/2010	GW1	G	-4				68	0.07	44		7.0	1300	3	4	240	21	37	<0.5	360	340	<20	5	10	1	<1	16
07/12/2010	GW2	G	-4				17	0.35	7		7.0	760	<0.2	4	120	9	23	4	370	110	<20	5	13	1	<1	7
07/12/2010	GW3	G	-4				69	1	11		7.0	1200	<0.2	4	220	11	19	9	240	270	<20	38	25	2	<1	20
08/12/2011	GW1	G	11			<0.08	64	0.51	11		7.8	1300	2.8	14	230	29	42	<0.5	390	480	60	9.5	9	31	<1	20
08/12/2011	GW2	G	11			<0.08	17	0.53	21		7.6	700	<0.2	11	130	11	34	3.3	430	120	20	4.4	7.4	26	<1	5.7
08/12/2011	GW3	G	11			<0.08	45	0.58	13		7.5	980	<0.2	6.2	180	12	18	3	390	260	<20	25	5.2	16	<1	9.1
04/12/2012	GW1	G	2			<0.08	0.03	63	<1	9.7	7.7	1600	2.8	18	120	17	22	<0.5	250	730	270	42	1.9	<1	<1	26
04/12/2012	GW2	G	2			<0.08	0.05	30	<1	20.15	8.0	670	0.63	15	81	10	22	4	220	120	<20	2.4	<1	<1	<1	2.3
04/12/2012	GW3	G	2			<0.08	0.07	110	<1	8.67	7.3	710	0.2	8.4	220	16	26	4.4	170	440	<20	12	<1	<1	<1	4
02/12/2014	GW1	G	6			<0.08	41	0.039	<1		7.9	1300	0.75	4	310	24	30	1.8	170	570	<20	1.1	<1	<1	<1	14
02/12/2014	GW2	G	6			<0.08	17	0.24	2.7		8.0	680	<0.2	32	110	11	26	5.5	650	110	<20	22	<1	<1	<1	4.5
02/12/2014	GW3	G				<0.08	41	0.093	1.4		8.0	910	<0.2	3.6	190	13	18	5	330	250	<20	18	1.5	<1	<1	8.3
15/12/2016	GW1	G	12			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15/12/2016	GW2	G	12			<0.08	74	0.93	1.7		8.1	2100	<0.2	12	440	42	45	3.6	380	960	260	260	8.6	1.2	<1	38
15/12/2016	GW3	G	12			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
02/12/2020	GW1	G	4			<0.08	37	0.14	3.8	9.08	6.8	1000	<0.2	10	170	9.7	18	1.3	530	73	440	340	3.6	1.3	<1	10
02/12/2020	GW2	G	4			<0.08	57	0.19	2.4	0.5	6.8	1800	1.5	7.4	380	31	42	2.5	370	700	940	470	1.6	1.6	<1	25
02/12/2020	GW3	G	4			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Hydrock Summary Table of Information Provided - Groundwater Monitoring

Date	Sample Point	Sample Type	Sample Depth (AOD m)	Sample Depth (m Bgl)	Dry (Y/N)	pH	Ammonia mg/l as N	Nickel ug/L	Cadmium ug/L	Chloride mg/l as N	EC	Fats oil & Grease	Suspended solids	COD	DO
05/07/2009	GW1	G	54.26		N	7.41	1.99	4.7	<0.07	53.2					
05/07/2009	GW2	G	39		N	7.41	0.06	4.8	<0.07	23.3					
05/07/2009	GW3	G	39		N	7.31	0.07	4.3	<0.07	43.7					
12/08/2009	GW1	G	54.27		N	7.4	< 0.01	4.4	< 0.08	47					
12/08/2009	GW2	G	39.4		N	7.2	< 0.01	24	< 0.08	19					
12/08/2009	GW3	G	39.8		N	7.2	< 0.01	12	< 0.08	40					
05/11/2009	GW1	G		9.86	N	7.4	< 0.01	7.6	< 0.08	47					
05/11/2009	GW2	G		21.01	N	7.1	< 0.01	8.4	< 0.08	21					
05/11/2009	GW3	G		8.75	N	7	< 0.01	10	< 0.08	42					
21/11/2009	GW1	G		9.87	N	7.6	0.04	-	< 0.08	62					
21/11/2009	GW2	G		21.18	N	7.4	0.03	-	< 0.08	22					
21/11/2009	GW3	G		8.91	N	7.3	< 0.01	-	< 0.08	47					
15/09/2009	GW1	G	54.71		N	7.2	< 0.01	1.8	< 0.08	55					
15/09/2009	GW2	G	39.44		N	7.2	0.09	3.6	< 0.08	21					
15/09/2009	GW3	G	39.7		N	7.1	0.13	-	-	44	2000	<10	18000	<10	8.3
01/01/2010	GW1	G		9.77	N	7.5	<0.1	4	<0.08	180					
01/01/2010	GW2	G		9.1	N	7.3	-	-	-	-					
01/01/2010	GW3	G		8.66	N	7.2	-	-	-	-					
31/03/2010	GW1	G	-	-	N	7	< 0.01	10	<0.08	61					
31/03/2010	GW2	G			Y	7.2	0.08	2.9	<0.08	41					
31/03/2010	GW3	G			Y	7.3	0.07	2.5	<0.08	18					
28/04/2010	GW1	G	-	-	N		-	-	-	-					
28/04/2010	GW2	G		21.16	N	7.2	0.08	2.9	<0.08	41					
28/04/2010	GW3	G		8.7	Y	7.3	0.07	2.5	<0.08	18					
02/06/2010	GW1	G		9.51	N	7.4	0.05	3	<0.08	71					
02/06/2010	GW2	G		21.57	N	7.3	0.06	3.6	<0.08	18					
02/06/2010	GW3	G		8.74	N	7.2	0.09	2.7	<0.08	41					
16/09/2010	GW1	G		9.65	N	7.2	0.54	4.3	<0.08	73					
16/09/2010	GW2	G		21.16	N	7.2	0.16	4.5	<0.08	18					
16/09/2010	GW3	G		8.73	Y	7.2	0.09	7	<0.08	55					
07/12/2010	GW1	G		-	N	7	0.07	4	<0.08	68					
07/12/2010	GW2	G		-	N	7	0.35	7	<0.08	17					
07/12/2010	GW3	G		-	N	7	1	11	<0.08	69					
24/03/2011	GW1	G		9.49	N	7.1	0.04	2.9	<0.08	75					
24/03/2011	GW2	G		21.3	N	7.1	0.15	3.8	<0.08	17					
24/03/2011	GW3	G		8.75	N	7	0.07	2.5	<0.08	60					
29/06/2011	GW1	G		10	N	7.7	<0.01	<1	<0.08	77					
29/06/2011	GW2	G		21	N	7.6	<0.01	<1	<0.08	80					
29/06/2011	GW3	G		9	N	7.4	0.14	<1	<0.08	76					
23/09/2011	GW1	G		9.75	N	7.6	0.11	<1	0.15	70					
23/09/2011	GW2	G		21.34	N	7.4	0.11	<1	<0.08	20					
23/09/2011	GW3	G		9.12	N	7.3	0.18	<1	<0.08	57					
08/12/2011	GW1	G		-	N	7.8	0.51	11	<0.08	64					
08/12/2011	GW2	G		-	N	7.6	0.53	21	<0.08	17					
08/12/2011	GW3	G		-	N	7.5	0.58	13	<0.08	45					
15/03/2012	GW1	G		9.68	N	7.6	<0.01	<1	<0.08	65					
15/03/2012	GW2	G		21.25	N	7.6	<0.01	<1	<0.08	18					
15/03/2012	GW3	G		8.87	N	7.5	0.09	<1	<0.08	80					
06/06/2012	GW1	G		9.43	N	7.46	0.18	1.4	<0.08	69					
19/06/2012	GW2	G		21.02	N	7	1.9	1.5	<0.08	20					
06/06/2012	GW3	G		8.73	N	7.41	0.19	3	<0.08	110					
04/09/2012	GW1	G		9.2	N	7.2	0.19	<1	<0.08	110					
04/09/2012	GW2	G		21.1	N	7.3	0.26	1.8	<0.08	21					
04/09/2012	GW3	G		8.62	N	7.1	0.3	2.1	<0.08	110					
04/12/2012	GW1	G		9.7	N	7.7	0.03	<1	<0.08	63					
04/12/2012	GW2	G		20.15	N	8	0.05	<1	<0.08	30					
04/12/2012	GW3	G		8.67	N	7.3	0.07	<1	<0.08	110					
05/03/2013	GW1	G		8.66	N	7.6	0.19	<1	<0.08	51					
05/03/2013	GW2	G		21.22	N	7.4	0.37	<1	<0.08	21					
05/03/2013	GW3	G		8.42	N	7.4	0.3	<1	<0.08	60					
11/06/2013	GW1	G		9.06	N	7.2	0.71	<1	<0.08	48					
11/06/2013	GW2	G		21.24	N	7.2	0.38	1.9	<0.08	18					
11/06/2013	GW3	G		8.73	N	7.1	0.51	1.5	<0.08	52					
04/03/2014	GW1	G		8.67	N	7.7	0.65	<1	<0.08	45					
04/03/2014	GW2	G		21.18	N	7.7	0.75	<1	<0.08	18					
04/03/2014	GW3	G		8.78	N	7.6	0.56	<1	<0.08	47					
04/06/2014	GW1	G		8.8	N	8.1	0.41	5	<0.08	42					
04/06/2014	GW2	G		21.06	N	7.9	0.33	2.7	<0.08	18					
04/06/2014	GW3	G		8.76	N	7.7	0.25	5.7	<0.08	44					
03/09/2014	GW1			9.06	N	8.2	0.1	<1	<0.08	38					
03/09/2014	GW2			21.24	N	8.2	0.27	1.1	<0.08	17					
03/09/2014	GW3			8.89	N	8.1	0.12	<1	<0.08	40					
30/03/2016	GW1	G		9.12	N	8.3	0.1	1.8	<0.08	39					
30/03/2016	GW2	G		2.07	N	8	2.9	2.9	0.084	24					
30/03/2016	GW3	G		8.54	N	7.9	3.5	3.5	<0.08	44					
22/06/2016	GW1	G		9.17	N	7.7	0.16	1.1	<0.08	37					
22/06/2016	GW2	G		2.88	N	7.1	0.71	5.7	<0.08	95					
22/06/2016	GW3	G		8.76	N	7.7	0.18	<1	<0.08	38					
05/09/2016	GW1	G		9.24	N	7.6	0.31	4.2	<0.08	38					
05/09/2016	GW2	G		2.91	N	7.6	0.26	<0.08	<0.08	38					
05/09/2016	GW3	G		Destroyed	Y	-	-	-	-	-					
21/03/2018	GW1	G		Flooded	N	-	-	-	-	-					
21/03/2018	GW2	G		1.22	N	8.1	0.3	<1	<0.08	31					
21/03/2018	GW3	G		Destroyed	N	-	-	-	-	-					
18/03/2020	GW1	G		0.26	N	4.8	0.16	4.8	<0.08	42					
18/03/2020	GW2	G		0.74	N	4.9	0.19	4.9	<0.08	33					
18/03/2020	GW3	G		Destroyed	Y	-	-	-	-	-					
04/05/2020	GW1	G		9.02	N	8.1	0.086	2.3	<0.08	74					
04/05/2020	GW2	G		1.54	N	8	0.51	5.9	<0.08	75					
04/05/2020	GW3	G		Destroyed	Y	-	-	-	-	-					
15/09/2020	GW1	G	65.02		N	8	<0.050	<1	<0.08	66					
15/09/2020	GW2	G	60.64		N	7.8	1.1	2	<0.08	88					
15/09/2020	GW3	G		Destroyed	Y	-	-	-	-	-					
09/03/2021	GW1	G		0.45	N	7.8	0.054	1.6	<0.12	44					
09/03/2021	GW2	G		1.37	N	7.6	0.44	4	<0.12	40					
09/03/2021	GW3	G		Destroyed	Y	-	-	-	-	-					

Mick George Ltd Provided Documentation



Notes

Grid and levels relative to OS active GPS network.

Rev	Date	Description

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Client

MICK GEORGE Limited

Project

THRAPSTON QUARRY

Title

CELL LOCATION PLAN

Drawn : MEG	Approved : MEG
Date : 02/10/2009	Scale : 1/2500

Drawing No.	Paper size	Revision
MG310/7	A3	

Photo 1 – View to NNW from SW corner of site, showing site entrance, amenity area and weighbridge (left, middle ground) and internal haul road (middle ground). The restored areas of the Site are evident in the right back ground.

Photo 2 – View to NNE from SW corner of site. The internal haul road and wheelwash facility are evident in the middle of the photograph; the engineered side wall of Cell 5 is evident in the right back ground.

Photo 3 – Location of groundwater/gas monitoring borehole GW1. The amenity area of the site is visible in the background and the northern internal haul road in the middle of the photograph.

Photo 4 – View to SE from NW corner of the current active cell (Cell 5) showing landfilling with soils and stones. The engineered basal liner and side wall construction of the Cell are evident, with the intracell bund in the background.

Photo 5 – View to NW from northern boundary of Cell 5 across the restored area of the landfill (Cells 7, 4, 1 and 2).

Photo 6 – View to NW from northern boundary of the restored area of the landfill (Cell 1), with groundwater/gas monitoring borehole (GW2) in the foreground and the agricultural land to the north of the Site in the background.

Photo 7 – View to west from the eastern boundary of the area of Cell 6. The accumulation of water within the area is evident and the drainage pump in the foreground.

Photo 8 – Drainage channel to the east of the landfill area, which channels drainage from the site towards the lagoons of the surface water management system.

Photo 9 – Exposed geology within the base and sides of the drainage channel.

Photo 10 – Western boundary of the lagoons of the surface water management system. The input of the drainage channel is evident in the foreground; the first lagoon is evident, which is heavily vegetated with willow trees and rushes.

Photo 11 – View to south-west across the western lagoon showing the rushes and other vegetation within it.

Photo 12 – View to ENE across the second drainage lagoon. The discharge into from the western lagoon was visually estimated to be about 1 litre/min.

Photo 13 – View to NNE across the eastern drainage lagoon, showing the agricultural land to the north; there was no drainage either into or out of the lagoon.

Photo 14 – Consented discharge point for surface water drainage from the site.

Photo 15 – Drainage channel downstream of the discharge point immediately upstream of the confluence with the drainage channel from Castle Manor Farm (which enters from the right).

Photo 16 – The drainage channel that receives site drainage downstream of its confluence with the drainage channel from Castle Manor Farm (dry).

Photo 16 – View west up the drainage channel that issues to the north of the Site; water was flowing within this channel compared to the other surface drainage channels that were dry during the walkover.

Photo 17 – Limestone geology towards the top of the left (southern) bank of the drainage channel.

Photo 18 – Clay geology at the base of the left (southern) bank of the drainage channel; this underlies the limestone geology above.

Photo 19 – The western end of the drainage channel, where the issue is marked on the 1:2,500 detailed geological map.

Photo 20 – Polopit Brook immediately to the west of Polopit (road) and upstream of its confluence with the drainage channel that receives drainage from the Site.

Photo 21 – Polopit Brook immediately to the west of Polopit (road) and downstream of its confluence with the drainage channel that receives drainage from the Site and downstream of the spring marked on the 1:5,000 scale map.

Photo 22 – Polopit Brook within Polopit, where it is crossed by a track used by motor vehicles for access.

Photo 23 – Polopit Brook within Polopit, where the channel form is impacted by adjacent farming activities; particularly the movement of cattle.

Photo 24 – Polopit Brook downstream of Polopit and upstream of Titchmarsh Meadows SSSI; the water was noticeably discoloured and there was a notable unpleasant odour.

Photo 25 – Polopit Brook along the south-western boundary of Titchmarsh Meadows SSSI looking upstream; the impact of cattle movement on the channel form was evident.

Thrapston Landfill Site

Construction Quality Assurance Plan for the Drilling of In Waste Gas Monitoring Boreholes

A109017

Mick George Ltd
July 2018
Prepared on behalf of WYG Engineering Limited.

MICK GEORGE

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creative minds safe hands

Document control

Document:	Construction Quality Assurance Plan for the Drilling of In Waste Gas Monitoring Boreholes
Project:	Thornhaugh Landfill Site
Client:	Mick George Limited
Job Number:	A109017 QP01
File Origin:	\\southampton14\Data\Projects\Mick George (G05059)\A109017 (MGL Boreholes Installation 2018)/Reports

Revision:	1st Draft	
Date:	13/08/2018	
Prepared by: Alex Edward	Checked by: Michael Jones	Approved By: Michael Jones
Description of revision:		

Revision:		
Date:		
Prepared by:	Checked by:	Approved By:
Description of revision:		

Contents

Drawings

MG310/51 – Cell Location Plan

A109071-BLP-01 – In Waste Borehole Location Plan

Appendices

Appendix A – Proposed In Waste Gas Monitoring Borehole Design

Appendix B – Typical CQA Proforma

1.0 General

1.1 Project Description

1.1.1 This document has been prepared to consolidate the details of the Construction Quality Assurance (CQA) procedures that shall be adopted during the drilling of in waste landfill gas monitoring boreholes at Thrapston Inert Landfill Site (the Site). The site location and layout is shown on Drawing Number MG310/51.

1.1.2 Thrapston Inert Landfill is located at approximately 0.5km east of Thrapston in Northamptonshire at National Grid Reference TL 01463 78375. The site is owned and operated by Mick George Limited.

1.1.3 The area surrounding the site is mainly rural in nature and is comprised of agricultural land. Adjacent to the south of the site is the A14, and a postal distribution centre adjacent to the south west corner of the site. There are also numerous farmhouses within 1,000m of the site as well as areas of woodland and trees. 600m to the north of the site is the small village of Titchmarsh. The western boundary is abutted by Islington Road.

1.1.4 The River Nene and associated lakes are located 1300m to the north east of the site, running from north west to south east.

1.1.5 According to British Geological Survey the geological setting of the site consists of both Sandstone and Siltstone, and Clay Deposits. The Sandstone and Siltstone Deposits of the Kellaways Sand Member were formed in an environment previously dominated by shallow seas. The Oxford Clay Formation beneath the Kellaways Sand Member was formed in an environment dominated by shallow seas.

1.1.6 According to the Environment Agency website, the site partially overlies a Secondary A – Bedrock Designation (Sand & Gravel River Terrace Deposits), which is classed as a Minor Aquifer High on the groundwater vulnerability map. These sand and gravel materials have been extracted as part of the quarrying operations.

1.1.7 The site is not located within a Groundwater Source Protection Zone (GSPZ).

1.1.8 The site has been engineered with an artificial geological barrier to the base and reshaped side slopes with a maximum permeability of 1.0 x 10^{-7} m/sec and a thickness of 1.0 metre measured perpendicular to the slope.

Project Team Members

CQA Project Manager	-	WYG – Marc Holzer
CQA Project Engineer	-	WYG – TBC
Client Contact	-	Mick George Limited – Stuart Richardson

1.2 Responsibilities of Team Members

CQA Project Manager

1.2.1 The CQA Project Manager retains overall responsibility for the project, together with the review and approval of the Construction Quality Assurance procedures.

CQA Project Engineer

1.2.2 The CQA Project Engineer shall be responsible for:-

- Project and technical management and shall attend any pre-contract and progress meetings;
- Establishment and implementation of the on-site CQA procedures through the thorough training of the Operator's staff if required;
- The daily implementation of the procedures detailed in the CQA Plan including material receipt, inspection and documentation;
- The CQA Project Engineer will monitor and supervise the drilling works. Typical CQA pro forma used by the CQA Project Engineer on site are shown at Appendix B.
- Provision of the certification for the final third party CQA Validation Report, a copy of which is to be forwarded to the Environment Agency.

Contractor

1.2.3 The contractor for the drilling of the in waste boreholes at the Site shall be appointed Mick George Limited. Any party undertaking the work will be appropriately trained prior to commencement of the works.

Environment Agency Liaison

1.2.4 The Client shall inform the Environment Agency of the start date of the construction works.

1.2.5 Notification of any changes to the specification or CQA plan, prior to or during the drilling

works will be sent to the EA by the CQA Project Manager for their comments and approval.

1.2.6 During the drilling works any comments that inspecting Environment Agency Officers have during site visits with regards to the CQA activities should be made directly to the CQA Engineer whilst on site.

1.3 Definitions

1.3.1 For clarification the following definitions are given:-

1.3.2 **Construction Quality Assurance (CQA)** – A planned and systematic pattern of all protocols and actions employed to provide confidence that items or services meet contractual and regulatory requirements, and will perform satisfactorily in service.

1.3.3 **CQA** refers to the protocols and actions employed by the CQA Engineer, to ensure conformity of the systems being constructed and installed to this CQA Plan, the Drawings and Specification. CQA is provided by a third party independent from production and installation.

1.3.4 **CQA Plan** – This document which includes site information, outline of the design, CQA procedures, construction specification and any testing regimes if required.

1.3.5 **CQA Validation Report** - The CQA Project Engineer will produce and submit the CQA Validation Report to the Environment Agency upon completion of the works or every six months during construction. All Environment Agency's queries, comments and correspondence regarding the CQA Validation Report should be addressed to the CQA Project Engineer, who will then arrange for the relevant information to be forwarded to the Environment Agency.

2.0 Project Details

2.1 Outline of Works

2.1.1 The works to be carried out at Thrapston will comprise the drilling of 15 in waste boreholes as shown on Drawing Number A109017-BLP-01.

2.2 Design Details

2.2.1 The in-waste landfill gas monitoring boreholes will be drilled to penetrate the majority of the depth of waste but will terminate above the geological barrier with a minimum 1m stand-off. The depths of the boreholes have been calculated using up to date survey data as given in the Table 1 below:-

Table 1 – borehole details

Borehole Number	Eastings	Northings	Restored Elevation (mAOD)	Clay Liner Elevation (mAOD)	Proposed Final Borehole Depth (m)	Standoff to Liner (m)	Base of Zone 1 Depth BGL (m)	Base of Zone 2 Depth BGL (m)
BH1	501440	278574	63.82	54.90	7.92	1	6.92	7.92
BH2	501503	278539	62.54	54.71	6.83	1	5.83	6.83
BH3	501550	278501	61.30	55.30	5.00	1	4.00	5.00
BH4	501468	278466	62.50	54.34	7.16	1	6.16	7.16
BH5	501532	278450	62.42	54.36	7.06	1	6.06	7.06
BH6	501452	278397	62.57	54.51	7.06	1	6.06	7.06
BH7	501528	278384	61.30	54.10	6.20	1	5.20	6.20
BH8	501432	278324	63.58	54.39	8.19	1	7.19	8.19
BH9	501503	278339	61.83	53.99	6.84	1	5.84	6.84
BH10	501550	278296	60.90	53.55	6.35	1	5.35	6.35
BH11	501492	278258	63.21	54.30	7.91	1	6.91	7.91
BH12	501526	278206	62.94	55.12	6.82	1	5.82	6.82
BH13	501427	278217	65.06	54.80	9.26	1	8.26	9.26
BH14	501443	278158	65.00	54.74	9.26	1	8.26	9.26
BH15	501518	278155	63.80	54.40	8.40	1	7.40	8.40

2.2.1 Drilling to the zone 1 depth for each borehole (as defined in the above Table) may proceed in accordance with standard drilling practices. Drilling between the zone 1 depth and the zone 2 depth must be carried out in increments of 300mm or less and the CQA Engineer must inspect the arisings on removal. The drill operator must also be more alert to changes in the drilling environment. Drilling will not take place in zone 3 which is defined as up to 1m above the mineral liner.

2.2.2 If during the works the drilling rig encounters any obstacles that prevent drilling at the preferred location, drilling will be restarted as close as possible to the original location under the direction of the CQA Project Engineer and where necessary with approval from the EA.

2.2.3 In the event that a borehole is over drilled such that the integrity of the mineral liner is compromised a minimum 1.5m bentonite seal will be applied to the base of the borehole as soon as the breach becomes apparent. The bentonite seal will be installed as a series of 300mm lifts of bentonite pellets, verified by the use of a plum line and hydrated in between each lift. The details of the breach will be notified to the Environment Agency as soon as is practicable and will be included in the CQA Validation Report. The drilling operator is required to ensure that sufficient bentonite and water is to hand at the drilling location prior to the commencement of drilling operations.

2.2.4 The generalised design for the In Waste Boreholes is shown in Appendix A. However the general design for the boreholes will be as follows:-

- 50mm HDPE slotted pipe will be installed from the bottom of the plain lining to the base of the borehole. The connections between the slotted, plain pipe will be threaded and screwed together. The base of the slotted pipework will be capped by a threaded end cap;
- A bentonite seal will be used for at least 1m below the ground level. The remainder of the slotted section will be filled with non-calcareous pea gravel (5 to 10 mm gravel);
- 50mm plain HDPE pipe will be emplaced for at least 2m below the ground level to the top of the screened section. The top of the slotted pipe will be air tight and completed with a removable "bung style" gas tap;
- Headworks will be installed above ground level to protect the pipe from damage, comprising a lockable steel cover set in concrete. The boreholes will be locked, secure from vandalism and accidental loss and/or damage. All boreholes will be clearly marked and visible to all site operatives; and
- All arisings will be suitably disposed of with the current working area of the site.

3.0 Drilling and Installation Methodology

3.1 Drilling

3.1.1 The boreholes will be drilled using a cable percussion drilling rig. Cable percussion drilling uses gravity to impel the auger into the ground and as such the trajectory of the auger is always vertical, correspondingly, the verticality of the borehole is always maintained.

3.1.2 The depth of the borehole will be continually monitored using a plumb line dropped into the borehole each time the auger is removed to clear the arisings.

3.1.3 Drilling will proceed unimpeded in zone one. As the auger enters zone two drilling will proceed in 300mm increments and the arisings will be inspected at each increment to verify that they contain no trace of the basal mineral liner. No drilling is anticipated in zone three. Drilling will cease once the target depth has been attained.

3.1.4 In the event that material from the basal mineral liner is found in the arisings during drilling in zone two drilling operations will immediately cease and the measures outlined in 2.2.4 will be instigated.

3.2 Installation

3.2.1 Once the target depth has been reached the individual components of the permanent casing will be assembled and installed into the borehole.

3.2.2 The gravel and bentonite back filling of the annulus between the edge of the borehole and the permanent casing will be achieved by slowly pouring the material into the borehole whilst agitating the top of the casing to prevent bridging. If bridging is suspected, then a weighted plumb line will be used to tamp the top of the backfill to reinstate the flow of material down the borehole.

3.2.3 Where temporary casing has been installed during the drilling process it will be withdrawn incrementally one section at a time after the permanent casing has been installed. As each section is removed the gravel/bentonite backfill will be installed into the cleared section of the borehole.

4.0 Construction Quality Assurance

4.1 Documentation

4.1.1 An effective CQA plan depends on the recognition of all construction activities that should be monitored and on assigning responsibilities for the monitoring of each activity. This is accomplished and verified by supervision and documentation. The CQA Project Engineer will supervise and document all quality assurance requirements.

4.1.2 The CQA Project Engineer will provide the Employer with signed records to verify that all the borehole installations have been carried out in accordance with this CQA Plan and will also maintain a file of relevant drawings and specifications, the CQA Plan and daily logs which can made available upon request to the Contractor, Employer or EA officers.

4.2 Daily Record Keeping

4.2.1 Standard report procedures will include preparation of a CQA pro formas as shown in Appendix A.

4.2.2 As a minimum the following will also be recorded in the CQA Project Engineer pro formas:-

- Observations on weather conditions;
- Equipment and personnel on-site;
- Photographic evidence of each boreholes drilled;
- Any design, location and / or specification changes may be necessary during monitoring unit installation works;
- Summary of activity on site; and
- Any other extraordinary events which take place on site and are not recorded elsewhere.

4.3 Construction Quality Assurance Validation Report

4.3.1 Following completion of the installation of the in waste monitoring boreholes, the CQA Project Engineer will submit to the Employer and EA a signed final Construction Quality Assurance Validation report (CQA VR) on the supervised works and documentation completed during the time period of the specified works.

4.3.2 The CQA VR will describe the in waste monitoring borehole installation works. The report will detail that the work was carried out in accordance with the requirements and objectives of the specification and this CQA Plan. The summary document will provide all necessary supporting information. As a minimum, the CQAR will include:

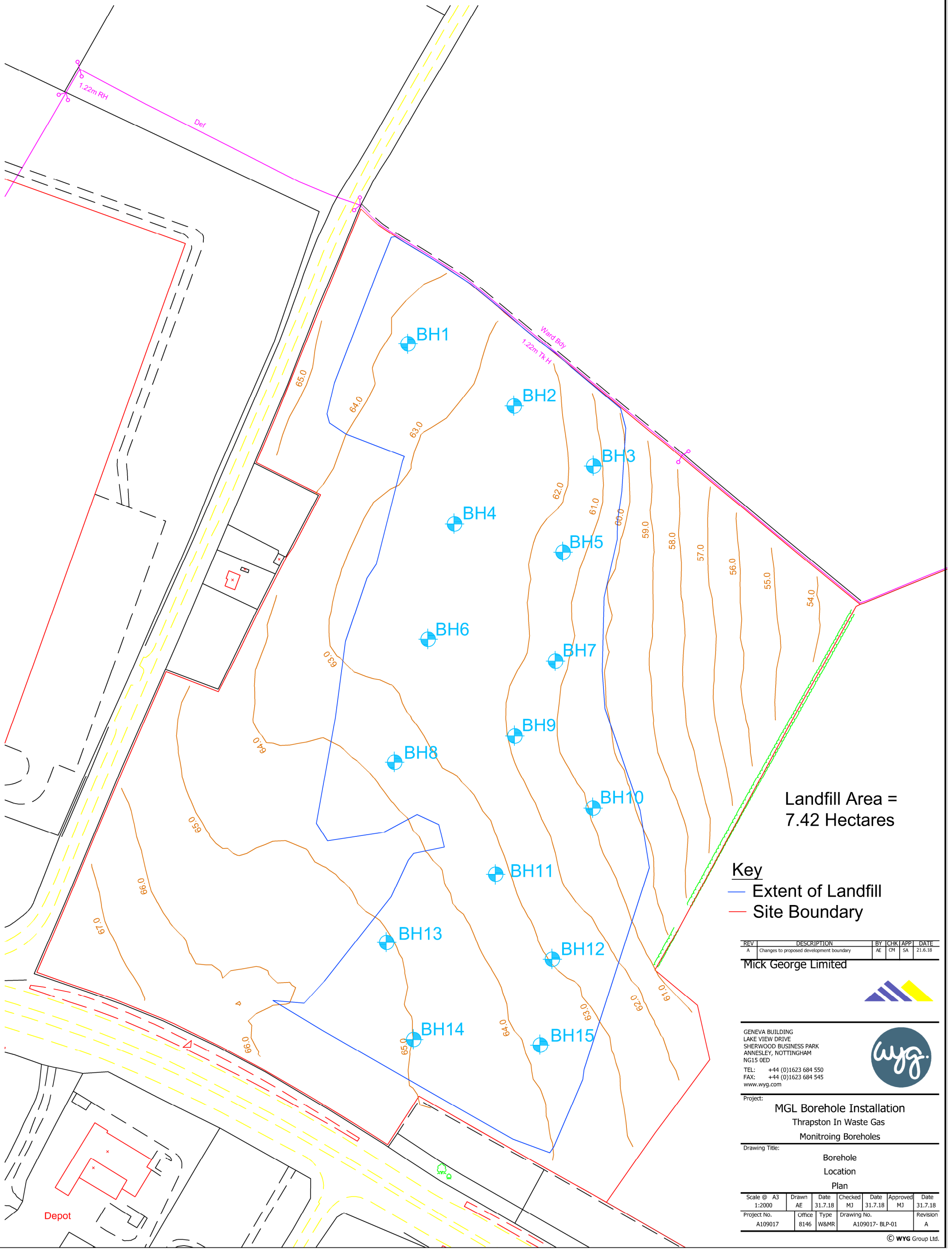
- Summaries of all drilling and monitoring borehole installation activities and details;
- Drilling logs and site check sheets;
- Changes from design and material specifications; and
- Details of any failures or problems and any remedial measures taken during the works

Drawings

MG310/51 – Cell Location Plan

A109071-BLP-01 - In waste Borehole Location Plan

DO NOT SCALE: CONTRACTOR TO CHECK ALL DIMENSIONS AND REPORT ANY OMISSIONS OR ERRORS



Landfill Area =
7.42 Hectares

Key

- Extent of Landfill
- Site Boundary

REV	DESCRIPTION	BY	CHK	APP	DATE
A	Changes to proposed development boundary	AE	CM	SA	21.6.18

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Project:

MGL Borehole Installation

Thrapston In Waste Gas

Monitroing Boreholes

Drawing Title:

Borehole

Location

Plan

Scale @ A3	Drawn	Date	Checked	Date	Approved	Date
1:2000	AE	31.7.18	MJ	31.7.18	MJ	31.7.18

Project No.	Office	Type	Drawing No.	Revision
A109017	8146	W&MR	A109017- BLP-01	A

501250E
501500E
501750E
502000E
278500N
278250N
278000N

CELL 1
CELL 2
CELL 3A
CELL 3B
CELL 4
CELL 5
CELL 6
CELL 7
CELL 7A
CELL 7B
CELL 8

Depot

Notes

Grid and levels relative to OS active GPS network.

Rev	Date	Description

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Project
Thrapston Quarry

Title
Cell location plan

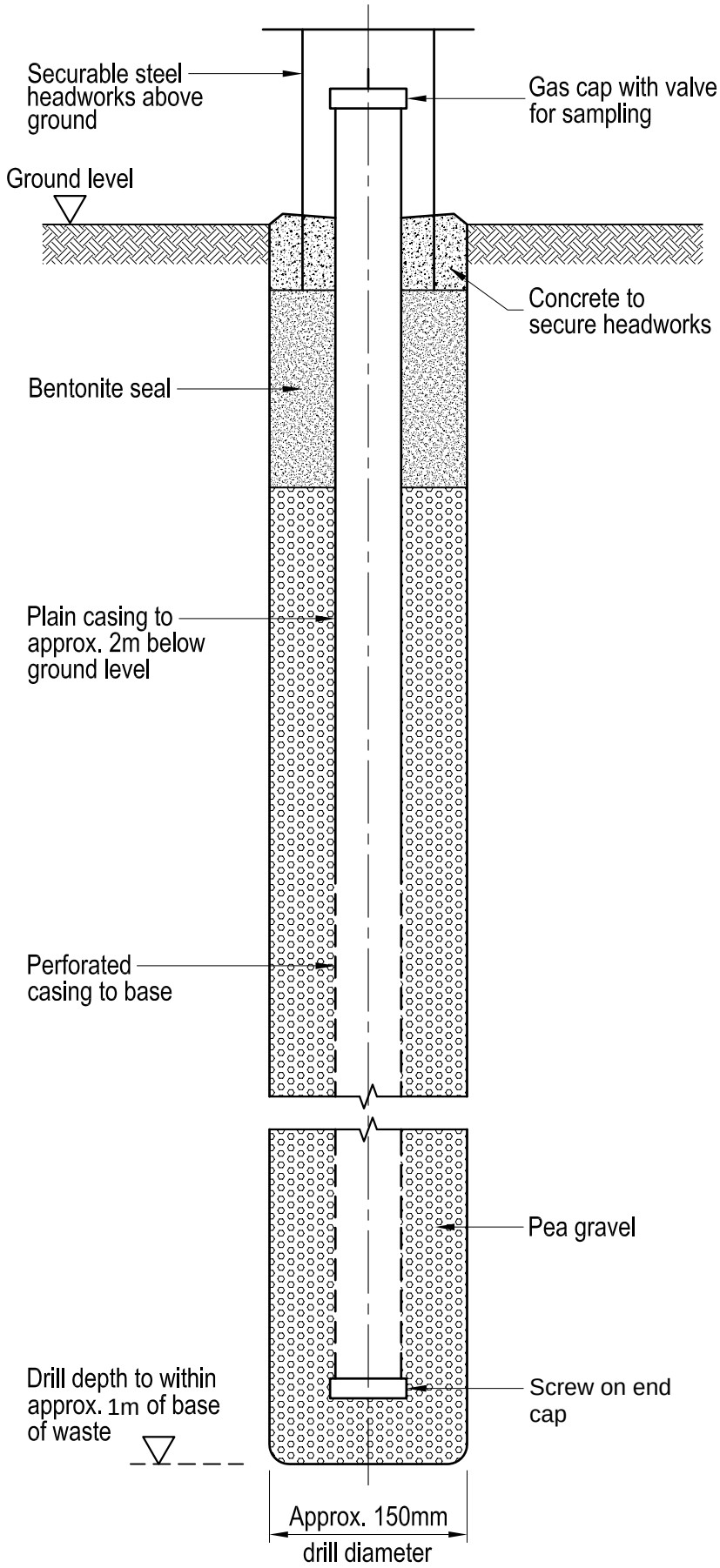
Drawn : IRM	Approved : MEG
Date : 25/11/2014	Scale : 1/2500

Drawing No.	Paper size	Revision
MG310/51	A3	

Appendices

Appendix A

Proposed In Waste Gas Monitoring Borehole Design



MICK GEORGE	PROPOSED IN-WASTE GAS MONITORING BOREHOLE DESIGN	NOT TO SCALE

Appendix B

Typical CQA Pro forma

DAILY RECORD SHEET FOR CQA PROJECT ENGINEER FOR BOREHOLE DRILLING

Client:	**Site:**	**Project:**
Date:	**Weather:**	
Start:	**Finish:**	

Activities Undertaken	
Borehole Reference Number	
Drilling Rig details	
Check for Services	
Drilling of Boreholes	
Samples Taken (Including Lab Reference No.):	
Photographs Taken (Description / Frame):	
Installation Details	
Disposal of Arisings	
Planned Works for the following Day:	

Signed: **(CQA Project Engineer)** **Dated:**

RECORD OF COMMUNICATION	
CONTRACT NUMBER	**DATE**
CQA PROJECT ENGINEER	**TIME**
OTHER PARTY	
SUMMARY DISCUSSION	
AGREEMENT/CONCLUSION	
FURTHER ACTION REQUIRED	
SIGNED	**DATE**

Rectory Farm, Thrapston Landfill — Closure Report

B026487
February 2021

PRESENTED TO

Mick George limited
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Huntingdon,
PE29 6XU

PRESENTED BY

Tetratech
Geneva Building,
Lake View Drive,
Sherwood Business Park,
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Nottingham,
NG15 0ED

Prepared by:

Michaela Fry Senior Consultant	February 2021

Reviewed by:

Michael Jones Associate	February 2021

Authorised by:

Michael Jones Associate	February 2021

TABLE OF CONTENTS

LIST OF TABLES

DRAWINGS

Drawing Number - A109017-BLP-01B – Site Boundary and In Waste Boreholes

Drawing Number - MG310/16 – Restoration Contours

Drawing Number – EOY/01/2021 – End of Year Survey

1.0 INTRODUCTION

1.1 REPORT CONTEXT

1.1.1 Tetratech has been commissioned by Mick George Limited to prepare a Closure Plan for Rectory Farm Thrapston.

1.1.2 The Rectory Farm Thrapston Landfill site is located at National Grid Reference TL 01470 78354, 0.5km East of Thrapston in Northamptonshire. This report relates to the permit PP3233XK.

1.2 GENERAL REQUIREMENTS

1.2.1 The term landfill 'closure' relates to a site that stops operating and no longer receives wastes. The closure process establishes the measures that need to be in place in order to ensure that there is an appropriate level of control and monitoring of the potential hazards and risks associated with a site. Once it can be demonstrated that the site no longer poses any potential hazard or risk to the environment or human health the Environmental Permit in place at the site may be surrendered

1.2.2 This closure plan has been prepared in line with the various headings of Section A of the Agency's current closure report template (reference 300_05_SD01), supported by operational instructions report 300_05. In particular, it will provide information intended to confirm to the Agency that:

- The area of the site to which the closure plan relates;
- The waste mass is stable;
- The infrastructure and procedures are in place for monitoring (landfill gas, leachate, groundwater and stability/settlement) during the closure and aftercare phase; and
- Procedures are in place for reporting any significant environmental impacts during the closure and aftercare phase.

1.2.3 The above requirements are addressed in the following sections.

2.0 SITE SETTING

2.1 SITE LOCATION

2.1.1 The Rectory Farm / Thrapston Landfill site is located at National Grid Reference TL 01470 78354, 0.5km East of Thrapston village in Northamptonshire.

2.1.2 The western boundary of the site borders the Haldens Parkway industrial estate, the A14 runs along the southern boundary and to the north and east agricultural land. Access to the site is via Islington on the western side of the site.

2.1.3 Drawing Number A109017-BLP-01B outlines the site proposed to be definitively closed and the location of monitoring infrastructure.

2.2 GEOLOGY AND HYDROGEOLOGY

2.2.1 According to the British Geological Survey's (BGS) 'Geology of Britain Viewer', the bedrock geology of the site comprises of Oxford Clay Formation – Mudstone and Kellaways Sand Member- Sandstone and Siltstone, Interbedded. The Oxford Clay Formation is a Sedimentary Bedrock formed approximately 157-166 million years ago in the Jurassic Period in an environment dominated by shallow seas. The Kellaways Sand Member-Sandstone and Siltstone, Interbedded is a Sedimentary Bedrock formed approximately 164-166 million years ago also in the Jurassic Period in an environment dominated by shallow seas.

2.2.2 The Superficial deposits are Oadby Member – Diamicton and Glaciofluvial Deposits, Mid Pleistocene – Sand and Gravel. Both Superficial Deposits were formed up to 2 million years ago in the Quaternary Period, in a local environment previously dominated by ice age conditions, these sedimentary deposits are glacigenic in origin

2.2.3 **.** With reference to the Multi Agency Geographic Information for the Countryside's (MAGIC) website under the Groundwater Vulnerability Map, the site lies in an area of Medium-Low, Medium High and High but does not lie in a Groundwater Source protection Zone. In terms of aquifers, the MAGIC website shows that the site overlies a Secondary A aquifer in bedrock and a Secondary (Undifferentiated) aquifer in the superficial deposits. A Secondary A aquifer has permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases firms an important source of base flow to rivers; these are generally aquifers formerly classified as minor.

2.3 ECOLOGY

2.3.1 The Multi Agency Geographic Information for the Countryside's website (MAGIC) identifies three Sites of Scientific Interest (SSSI) and a Local Nature Reserve (LNR). The distance of these receptors to the site boundary and their direction relative to the site as well as other ecological receptors within a 2km radius are detailed in Table 1 below:-

Table 1 Ecological Receptors

Receptor	Category	Distance (m)	Direction from Site
Aldwincle Marsh & The Upper Nene Valley Gravel Pits	SSSI / Ramsar/ SPA	1300	NW
Thrapston Station Quarry	SSSI	1399	SW
Titchmarsh meadow	SSSI	1666	NE
Titchmarsh Local Nature Reserve	LNR	1610	NW
Deciduous woodland	Priority Habitat	433	S
Deciduous woodland	Priority Habitat	628	S
Deciduous woodland	Priority Habitat	646	W
Deciduous woodland	Priority Habitat	755	S
Deciduous woodland	Priority Habitat	1064	NE
Deciduous woodland	Priority Habitat	1121	N
Deciduous woodland	Priority Habitat	1123	E
Deciduous woodland	Priority Habitat	1254	NE
Deciduous woodland	Priority Habitat	1309	SW
Traditional Orchard	Priority Habitat	1751	E

2.4 DEVELOPMENT OF THE INSTALLATION

2.4.1 Operations at Rectory Farm / Thrapston were regulated under permit reference PP3233XK. This permit authorised the importation of inert material for recycling and infill to achieve a beneficial restoration to agricultural land.

2.4.2 The site which has an engineered clay basal and side slope liner (geological barrier). On completion of filling to final levels, the site was capped with 1m of restoration soils comprising not less than 0.3m of topsoil.

2.4.3 The planning history of Rectory Farm/ Thrapston is summarised in Table 2 below. Rectory Farm Thrapston was a sand and gravel quarry and the infilling allowed for the progressive restoration of the worked phases of the quarry, as required under the extant planning consents.

Table 2 Planning & Permitting History of Rectory Farm Thrapston.

Date	Description
29/12/00	Application Number EN/01/23C. – application for extraction of sand and gravel with restoration to agricultural use by importation of inert waste (including the provision for recycling waste), Castle Manor Farm, Titchmarsh, nr. Thrapston
28/04/03	Application BT9879IY permit
05/07/04	BT9879IY Permit Determined
17/10/06	Variation Notice EP3837LU Issued
05/07/07	Removal of conditions 7 and 8 of planning application EN/01/23C which restricted works in an area proposed for road improvements now cancelled, thus allowing this additional area to be included in the mineral workings at land at Castle Manor Farm, Titchmarsh, Near Thrapston
22/01/09	The proposed variation of condition 40 of planning permission 07/00035/MIN to extend the end date to 30th September 2015 at Castle Manor Farm, Titchmarsh, Near Thrapston
11/01/18	Variation Notice PP3233XK Issued – Increase annual tonnage of waste to be accepted

3.0 SITE OPERATIONS

3.1 SITE OPERATIONS DURING THE SITE CLOSURE PERIOD

3.1.1 Waste disposal activities ceased in July 2015, the site is now fully restored and all site operations have ceased.

3.2 SITE OPERATIONS DURING THE AFTERCARE PERIOD

3.2.1 Following completion of restoration, it is considered that there is a reduced risk of nuisance associated with mud, debris, litter, leaks and spillages.

3.2.2 During the aftercare period, a competent person has made a visual inspection to identify any problems during each routine monitoring visit. In the unlikely event that nuisance associated with mud, debris or litter is observed, if there is evidence of fire or if there is evidence of a leak or spillage, remedial measures will be taken as necessary and recorded. A summary of the observations made and any remedial measures taken will be included in an annual report

3.2.3 The aftercare stage has included sampling and monitoring of groundwater (monthly) and landfill gas (six monthly).

3.3 SITE INFRASTRUCTURE

3.3.1 The site is now fully restored, and all site infrastructure removed.

3.4 SECURITY

3.4.1 All reasonable precautions are taken to prevent unauthorised access to the site. The existing site boundary fencing and secured entrance gates are be maintained. The integrity of the gates and fencing is inspected regularly during monitoring visits during the aftercare period. Any damage or defects are made secure by the end of the day that the damage is identified. If it is not possible to repair any damage or defects by the end of the working day temporary measures are taken. Final repairs are carried out as soon as is practicable and at least within five working days. A record of inspections and repair work is made and retained.

3.4.2 The site security arrangements will be reviewed annually. If the results of the routine site inspections show that no significant problems associated with unauthorised access to the site have occurred during the preceding year consideration will be given to reducing the site inspection frequency.

3.5 INSTALLATION ENGINEERING

3.5.1 No additional engineering works will take place as part of the closure strategy for this site.

4.0 RELEVANT SECTIONS OF CLOSURE PLAN TEMPLATE

The following sections address the requirements outlined in the Environment Agency's Closure Plan template (reference 300_05_SD01), supported by operational instructions report 300_05

4.1 AREA OF THE SITE PROGRESSING TO DEFINITIVE CLOSURE (SECTION 1)

Question 1.0 - Please provide a drawing (minimum scale 1:2500), indicating the area of the site you propose to definitively close".

4.1.1 Drawing Number A109017-BLP-01B outlines the installation area of the site proposed to be definitively closed.

4.2 WASTE MASS STABILITY (SECTION 2)

Question 2.0 - Please provide evidence that the capped and restored landfill will remain stable in the long term, or provide a justification as to why such evidence is unnecessary?

4.2.1 Proposed restoration elevations and landform shown on Drawing Number MG310/16 compare reasonably with those recently surveyed (2020) and presented in Drawing Number EOY/01/2021. These drawings suggest that landform stability has not been compromised to date and thus no further evidence is required at this stage.

4.2.2 There were no significant changes to the site's approved engineering and design from the original permit issue to the final area of engineering. Furthermore, independent CQA supervision was undertaken during the construction. As such, it is considered that the site does not represent a long-term stability risk.

4.3 SITE INFRASTRUCTURE (SECTION 3)

Leachate Infrastructure

Question 3.1 - Please provide details of the infrastructure that is in place to manage leachate during the aftercare period, or provide a justification as to why such details are unnecessary?

4.3.1 Due to the inert nature of the waste, there will be no leachate generated at the site and therefore no leachate management or monitoring is required.

Landfill Gas Infrastructure (A1.2.7)

Question 3.3 - Please provide details of the infrastructure that is in place to manage landfill gas during the aftercare period, or provide a justification as to why such details are unnecessary?

4.3.2 In terms of landfill gas generation at Rectory Farm Thrapston, no organic matter is present, and it is therefore

considered that the inert waste materials deposited at the site will not give rise to significant quantities of landfill gas. Concentrations of landfill gas are therefore considered to be negligible and no active gas management is required

4.3.3 In accordance with LFTGN03 in waste landfill gas monitoring infrastructure was installed within each completed cell as shown on Drawing Number A109017-BLP-01B. The boreholes will be monitored every six months during the aftercare, for concentrations of methane, carbon dioxide and oxygen.

Landfill Gas Infrastructure Maintenance

Question 3.4 - Please provide details, or reference to a document, which describes your procedures for maintaining the landfill gas management infrastructure during the aftercare period.

4.3.4 Gas infrastructure will be inspected during monitoring visits.

4.3.5 Any repairs or maintenance necessary will be undertaken by competent persons and generally in accordance with manufacturers' requirements within an appropriate timescale and a record of the work undertaken will be made and kept on site.

Groundwater and Surface Water Infrastructure

Question 3.5 - Please provide details of the infrastructure that is in place to monitor surface water and groundwater during the aftercare period, or provide a justification as to why such details are unnecessary?

4.3.6 Due to the inert nature of the wastes deposited, no groundwater management system is required at the site.

4.3.7 Groundwater will be monitored in borehole GW2 on the site boundary until the permit is surrendered.

4.3.8 There are no surface watercourses of discharges from the site, therefore no monitoring is required.

Groundwater and Surface Water infrastructure maintenance

Question 3.6 - Please provide details, or reference to a document, which describes your procedures for maintaining the surface water and groundwater monitoring infrastructure (including extraction where applicable) during the aftercare period.

4.3.9 During the closure period, an appointed competent person will check the groundwater monitoring infrastructure during each maintenance visit. The integrity of each borehole (e.g. checks for visible casing headworks integrity, etc.) will be inspected during each monitoring visit.

4.3.10 Any repairs or maintenance deemed necessary shall be undertaken within 1 month of the problem being identified. Any defects will be discussed and recorded in senior management tracker meetings along with actions and timescales and are reviewed and followed up. Details of all inspections and repairs shall be recorded and stored electronically.

Slope Stability/Settlement

Question 3.7 - Please provide details, or reference to a document, which describes your procedures for maintaining the restored surface of the landfill and any slopes and the stability of any other structures not included above during the aftercare period.

4.3.11 All necessary precautions were incorporated within the design and during construction of the installation to ensure that the risk of a breach in the lining system as a result of instability in the substrata or the lining system is negligible.

4.3.12 Once the site enters the closure period, a topographic survey of the site will be undertaken once a year (according to the recommendations of the Landfill Directive, Annex III) for a period of 5 years to monitor the settlement of the waste in the landfill. Thereafter it is proposed to decrease the frequency to every two years. The results of each survey will be presented in an annual report, which will be submitted to the Environment Agency.

4.3.13 The latest topographic survey to serve as a baseline in included as Drawing Number A109017-BLP-01B.

4.4 MONITORING (SECTION 4)

Leachate Monitoring

Question 4.1 - Please provide details, or reference to a document, which describes your procedures for monitoring leachate head and quality during the aftercare period. This should include details of contingency arrangements should assessment or compliance levels be exceeded.

4.4.1 Due to the inert nature of the waste, there will be no leachate generated at the site and therefore no leachate management or monitoring is required.

Landfill Gas Monitoring

Question 4.2 - Please provide details, or reference to a document, which describes your procedures for monitoring landfill gas during the aftercare period. This should include details of contingency arrangements should assessment or compliance levels be exceeded.

4.4.2 In accordance with LFTGN03 in waste landfill gas monitoring infrastructure was installed within each completed cell as shown on Drawing Number A109017-BLP-01B. The boreholes will be monitored every six months during the aftercare, for concentrations of methane, carbon dioxide and oxygen.

4.4.3 A set of robust contingency action plans, should assessment or compliance levels be exceeded, are set out below:-

4.4.4 Action Levels for methane will be set as 0.5% above background, which give Mick George the opportunity to take timely and appropriate action in order to avoid the Compliance Levels being exceeded. In the event of methane or flammable gas being recorded within the perimeter monitoring boreholes at concentrations exceeding 0.5% by volume, the following action will be taken:-

- The person in charge of the site will be informed; and
- The person in charge of the site will assess the risk and may increase the frequency of landfill gas monitoring to determine whether there is an increasing trend in gas concentrations. The Manager may inform the Environment Agency if the trend is considered to be rising.

4.4.5 In the event of methane or flammable gas being detected within the perimeter boreholes at concentrations exceeding 1.0% methane by volume, the following action will be taken:-

- The person in charge of the site will be informed;
- The person in charge of the site will assess the risk and may increase the frequency of landfill gas monitoring to determine whether there is an increasing trend in gas concentrations. The Manager may inform the Environment Agency if the trend is considered to be rising;
- The person in charge of the site will make an assessment of whether any receptors are potentially at risk from elevated methane concentrations and if this is considered likely, the need for receptor monitoring will be determined;
- Daily monitoring of the perimeter boreholes will be undertaken until concentrations of methane recorded in the boreholes fall below 1% by volume (20% LEL) and the Landfill Site Manager determines that the normal frequency of monitoring can be resumed; and
- In the unlikely event that methane (flammable gas) concentrations continue to remain elevated, the person in charge of the site will determine if remedial action is required. Any action taken will be agreed with the Environment Agency and recorded in the Site Diary.

4.4.6 During the aftercare period, a competent person will inspect the landfill gas infrastructure during each monitoring visit. Any repairs or maintenance necessary will be carried out in an appropriate timescale and a record of the work undertaken will be made.

Groundwater and Surface Water monitoring

Question 4.3 - Please provide details, or reference to a document, which describes your procedures for monitoring groundwater quality during the aftercare period. This should include details of contingency arrangements should control (assessment) or trigger (compliance) levels be exceeded.

4.4.7 Groundwater will be monitored in GW2 on the site boundary for a period of six months following infilling.

4.4.8 The groundwater monitoring network is shown on Drawing A109017-BLP-01B. Details of the points that are currently monitored including frequency and chemical constituents to be sampled are provided in the permit.

4.4.9 During closure, groundwater will continue to be monitored in accordance with the permit. This is proposed for

two years from the beginning of the closure period. Thereafter, a review will be undertaken to assess the feasibility of amending this proposed frequency of level measurements and quality.

4.4.10 Gathering of groundwater levels and water quality will be undertaken by the suitably trained personnel who will submit the samples to a UKAS accredited laboratory.

4.4.11 The groundwater monitoring data will be reviewed annually and any changes to assessment limits and contingency action plans considered necessary will be submitted to the Environment Agency.

4.4.12 In the event that any results exceed the compliance levels for groundwater specified in the Environmental Permit, the following actions will be taken:

- Issue notification report (Advise Site Operator and Environment Agency)
- Conduct confirmatory sampling and analysis
- Determine degree of risk presented by the breach.
- Review conceptual site model, Control Levels and Compliance Limits.
- Agree any corrective/remedial action with the Environment Agency.

Restored Surface Monitoring

Question 4.4. - Please provide details, or reference to a document, which describes your procedures for monitoring the restored surface of the landfill and any slopes and the stability of any other structures not included above during the aftercare period.

4.4.13 A topographic survey of the site will be undertaken once a year (according to the recommendations of the Landfill Directive, Annex III) for a period of 5 years to monitor the settlement of the waste in the landfill. Thereafter it is proposed to increase the frequency to every two years. The results of each survey will be presented in an annual report, which will be submitted to the Environment Agency. Please see Drawing Number EOY/01/2021 as an example.

4.4.14 In the event that significant differential settlement is identified from the year-on-year topographical surveys, consideration will be given to stripping the soils, re-grading the settled areas with imported inert materials, based on the likely risk posed by the degree of settlement.

4.4.15 Any remedial action carried out to restore the surface of the landfill will be recorded. If differential waste settlement disrupts elements of the gas or leachate extraction systems or the surface water management system, the affected part of the system will be excavated and/or repaired and/or replaced as necessary.

4.4.16 The aftercare inspection frequency of the restored landform initially will be identical to that of the closure period (annually) but may be amended subsequently by agreement with the Environment Agency.

4.5 REPORTING (SECTION 5)

Significant Environmental Effects

Question 5.1 - Please provide details, or reference to a document, which describes your procedures for reporting significant environmental effects to us.

4.5.1 Procedures will remain in place for the reporting of any cases where the trigger levels or emissions limits specified in the permit are exceeded or any other incidents which cause, or may cause, significant pollution. Any breaches or incidents will be reported to the Environment Agency using the Notification form that's provided in Schedule 5 of the environmental permit.

4.6 HABITATS (SECTION 6)

Habitats Sites

Question 6.1 - If your site is within a specified distance of a European site for nature conservation, or other designated site please provide details, or reference to a document, which describes how you will ensure that there is no impact from your landfill on that site during the aftercare phase. This may be achieved through completion of a nuisance and health risk assessment and the implementation of any mitigation measures identified.

4.6.1 In terms of closure, there are no proposed changes to the nature of the restoration works and therefore it is considered that there is no increased risk and the associated plans should still be relevant in minimising any amenity risks. Furthermore, once the restoration of the site is complete, it is considered that the amenity risks will be reduced.

4.6.2 Nevertheless, as mentioned in Section 3.2, it is proposed that a competent person will undertake visual inspections of the site during the aftercare period to identify any problems associated to amenity. If a problem is identified, remedial measures will be taken as necessary and recorded.

4.6.3 In light of the above, it's considered that the risk to habitats (as detailed in Table 1) following the closure of the landfill is considered to be low.

5.0 CLOSURE WORKS

5.1 PROPOSED MEASURES ON CESSATION OF ACTIVITIES

5.1.1 The site plant and office support infrastructure have been removed to ensure there is no chance of any pollution incidents during the post closure phase.

5.2 RESTORATION AND LANDSCAPING

5.2.1 The final landfill contours have been restored in accordance to the approved planning application. Following soil emplacement, the completed phases were sown initially with low maintenance grass seed to facilitate any final remedial works arising from settlement.

5.3 AFTERCARE

5.3.1 Once the restoration works were complete, the management and maintenance of the site commenced and continue for a proposed period of 5 years as set out in the planning permission. Monitoring of the restoration works will be undertaken throughout the aftercare period and appropriate remedial works undertaken as necessary. An annual review of aftercare works together with proposed aftercare works for the forthcoming year will be agreed with the Planning Authority.

5.3.2 Once the Environment Agency notifies Mick George, in writing, that the closure plan has been approved and a closure site inspection carried out, the site will be considered to be in definitive closure and will enter the aftercare phase.

5.3.3 The aftercare period will last until the environmental permit is successfully surrendered. Monitoring will be carried out for sufficient time to ensure that any changes in the conditions of the waste have been detected.

6.0 RISK ASSESSMENTS

6.1 HYDROGEOLOGICAL RISK ASSESSMENT

6.1.1 In terms of closure, it is considered that there is no increased risk to groundwater and therefore it is considered that a revised HRA is not required.

6.2 LANDFILL GAS RISK ASSESSMENT

6.2.1 In terms of closure, it is considered that there is no increased risk and as such a revised Landfill Gas Risk Assessment is not required.

6.3 STABILITY RISK ASSESSMENT

6.3.1 In terms of closure, there will be no additional engineering works for the site. As such, it is considered that there is no increased risk to stability and therefore a revised SRA is not required.

6.4 AMENITY RISK ASSESSMENT

6.4.1 The completion works undertaken at the site have ensured that the site is causing minimal disruption to the surrounding environment and human health. The environmental impact monitoring and mitigation measures detailed will ensure that there will be no permanent impact from the proposed works.

DRAWINGS

Drawing Number - A109017-BLP-01B – Site Boundary and In Waste Boreholes

Drawing Number MG310/16 – Restoration Contours

Drawing Number – EOY/01/2021 – End of Year Survey

DO NOT SCALE: CONTRACTOR TO CHECK ALL DIMENSIONS AND REPORT ANY OMISSIONS OR ERRORS

Key

- Extent of Landfill
- Site Boundary
- Groundwater Monitoring Borehole
- In Waste Gas Monitoring Borehole

Landfill Area =
7.42 Hectares

BH1 BH2 BH3 BH4 BH5 BH6 BH7 BH8 BH9 BH10 BH11 BH12 BH13 BH14 BH15

GW3

Depot

Castle Manor Farm

Oak Cottage

Pond

Drain

REV	DESCRIPTION	BY	CHK	APP	DATE

Mick George Limited

GENEVA BUILDING
LAKE VIEW DRIVE
SHERWOOD BUSINESS PARK
ANNESLEY, NOTTINGHAM
NG15 0ED

TEL: +44 (0)1623 664 550
FAX: +44 (0)1623 664 545
www.wyg.com

Project:

MGL Borehole Installation

Thrapston Groundwater

Monitoring Boreholes

Drawing Title:

Borehole

Location

Plan

Scale @ A3	Drawn	Date	Checked	Date	Approved	Date
1:3000	AE	6.8.18	MH	6.8.18	MJ	6.8.18

Project No.	Office	Type	Drawing No.	Revision
Plan	8146	ENV	A109017-BLP-01B	

501250E
501500E
501750E
278500N
278250N
278000N
Restored Area
Depot
A14

Notes

Grid and levels relative to OS active GPS network.

Reproduced from Ordnance Survey Superplan data.

Rev	Date	Description

MICK GEORGE
SECOND DROVE
MEADOW LANE
St. IVES
CAMBRIDGESHIRE
PE27 4YQ
Tel : 01480 498099 Fax : 01480 498077
www.mickgeorge.co.uk

Client

Mick George Limited

Project

Rectory Farm Thrapston

Title

Restoration contours & restored area

Drawn :IRM	Approved : MEG
Date :02/07/2014	Scale :1/2500

Drawing No.	Paper size	Revision
MG310/16	A3	

Notes

Grid and levels relative to OS active GPS network

Reproduced from Ordnance Survey digital map data

KEY:

Restored Contours

OS Map

Site Boundary

Spot Levels 62.61

Rev	Date	Description

MICK GEORGE
6 LANCASTER WAY
ERMINE BUISNESS PARK
HUNTINGDON
CAMBRIDGESHIRE
PE29 6XU
Tel : 01480 498099 Fax : 01480 498077
www.mickgeorge.co.uk

Client
Mick George Limited

Project
Thrapston Landfill

Title
End Of The Year Survey

Drawn : IMS | Approved : MEG

Date : 19/01/2021 | Scale :1/1250

Drawing Number: TPN_EOY/01/2021 | Paper size: A1 | Rev:

Appendix E Preliminary Geotechnical Risk Register

Geotechnical Hazard Identification – Desk Study Stage

Potential geotechnical hazards have been assessed in accordance with the general requirements of ICE/DETR Document 'Managing Geotechnical Risk' and the HE documents HD 41/15 and CD 622. The following pages set out the identified geotechnical risks and hazards which are associated with the proposed development and establish the approach which is to be taken to manage the risks including the geotechnical input and analysis.

Table E.1 is a preliminary assessment of possible geotechnical hazards at the site at Desk Study stage. This information is used to assist with ground investigation design.

Table E.1: Possible geotechnical hazards

Hazard	Comment	Hazard status based on desk study	
		Could be present and / or affect site (i.e. Plausible)	Unlikely to be present and/or affect site
Uncontrolled Made Ground (variable strength and compressibility)	Associated with the Landfill, Old Stone Pits and Castle Manor Farm.	✔	-
Soft / loose compressible ground (low strength and high settlement potential).	Possibility for alluvial type soils in the central north and associated with the drainage ditches and ponds.	✔	-
Shrink swell of the clay fraction of soils under the influence of vegetation.	Glacial Till, Kellaways Clay and Blisworth Clay have the potential for shrink/swell	✔	-
Variable lateral and vertical changes in ground conditions.	Numerous geological changes and outcrops downslope across the site. Nature of landfill and extent unknown.	✔	-
High sulfates present in the soils.	Potential for sulphates within natural and Made Ground soils.	✔	-
Adverse chemical ground conditions, (e.g. expansive slag).	Unlikely to affect the site.	-	✔
Obstructions.	Potential for underground structures and foundations around Castle Manor Farm.	✔	-
Existing below ground structures to remain.	Hydrock are not aware of any structures to remain.	-	✔ -
Shallow groundwater.	Issues and springs in surrounding area. Pond potential for spring at Castle Manor Farm and within granular deposits near surface.	✔	-
Changing groundwater conditions.	Groundwater levels likely seasonally variable.	✔	-
Risk from erosion.	Drainage ditches in the centre and north of the site that is shown as a potential tertiary river.	✔	-
Risk from flooding.	Low risk, except in close proximity to drainage ditches.	✔	-

Hazard	Comment	Hazard status based on desk study	
		Could be present and / or affect site (i.e. Plausible)	Unlikely to be present and/or affect site
Running sands and / or loose Made Ground, leading to difficulty with excavation and collapse of side walls.	Potential within granular Glacifluvial soils and landfill soils.	✔	-
Slope stability issues – general slopes.	Site slopes to a low point in the centre north of the site. Up to 20m level changes across the site.	✔	-
Slope stability issues – retaining walls or reinforced earth.	Retaining walls or reinforced earth may be required based on level changes.	✔	-
Earthworks – settlement (due to placement of fill on soft / loose ground).	Development platforms will necessitate the order of 10m with of fill and cut in parts. Site won material to be from A variety of sources, likely including landfill soils under necessary permits	✔	-
Earthworks – settlement of underlying soils during filing (where significant thickness of fill is placed).			
Earthworks – settlement of placed fill.			
Earthworks – poor bearing capacity of new fill.		✔	-
Earthworks – unsuitability of site won material to be reused as fill.		✔	-
Old Quarries, opencast works and mineral abstraction.	Historical quarrying in the southeast 'Old Stone Pits' and Sand and gravel pin in south-west	✔	
Cambered ground with gulls possibly present.	Potential for cambered ground to be present	✔	-
Relict Slip Surfaces.	Potential for Relict Slip Surfaces to be present.	✔	-
Solifluction.	Sloping wite with potential for solifluction deposits.	✔	-
Problematic soils (silts and rewetting etc.).	Nature of 'inert' landfill unknown.	✔	-

Appendix F Plausible Source-Pathway-Receptor Contaminant Linkages

Summary of Potential Contaminant Linkages

Table F.2 lists the plausible contaminant linkages which have been identified. These are considered as potentially unacceptable risks in line with guidelines published in LCRM (2021) and additional risk assessment is required.

Source – Pathway – Receptor Linkages have been assessed in general accordance with guidance in CIRIA Report C552 (Rudland et al 2001) but modified to add a 'no linkage' category and to remove low/moderate risk (See Table F.1).

It should be noted that whilst the risk assessment process undertaken in this report may identify potential risks to site demolition and redevelopment workers, consideration of occupational health and safety issues is beyond the scope of this report and need to be considered separately in the Construction Phase Health and Safety Plan.

Table F.1: Consequence versus probability assessment.

		Consequence			
Probability		Severe	Medium	Mild	Minor
	High Likelihood	Very high risk	High risk	Moderate risk	Low risk
	Likely	High risk	Moderate risk	Low risk	Very low risk
	Low Likelihood	Moderate risk	Low risk	Low risk	Very low risk
	Unlikely	Low risk	Very low risk	Very low risk	Very low risk
	No Linkage	No risk			

Table F.2: Exposure model – final source-pathway-receptor contaminant linkages

Sources	Possible Pathways	Receptors	Probability	Consequence	Risk Level	Comments	
Metals, metalloids, PAH, TPH and asbestos in Made Ground associated with the landfill materials in the west. (S1)	Ingestion, inhalation or direct contact.	Site users.	Likely	Medium	Moderate	Made Ground associated with the landfill will be present in the west of the site. Whilst the material is classed as 'inert' the soils may contain metals, metalloids, and PAH which may form the development platform. Contact with these materials is likely in limited areas of landscaping. However, over the majority of the site, the risk will be low as the proposed development will comprise hardstanding and building footprint.	Contact with these materials is likely in areas of Landscaping or as part of the development platform or where remaining in situ. Mitigation measures may be required to break the SPR linkage.
	Inhalation of fugitive dust.	Neighbours.	Low likelihood	Medium	Low		The risk of significant generation of dust is likely only during site development process and can therefore be controlled. Asbestos materials are not anticipated to be present based on 'inert' nature of landfill.
	Leaching through unsaturated zone.	Groundwater and possible abstractors.	Likely	Medium	Low		Where present the majority of the soils are resting on impermeable strata limiting flow. However, landfill soils may be resting on Kellaways Sand or Cornbrash Formation. No groundwater abstractions within 1km of the site.
	Surface run-off.	Aquatic ecosystems. Surface water and possible abstractors.	Likely	Medium	Moderate		There is a drainage ditches in the north and centre of the site. Topography means that any surface water will flow towards Thorpe Brook.
	Base flow from contaminated groundwater.		Likely	Medium	Moderate		Migration of groundwater from landfill likely constrained by cohesive deposits at base and placed along sides prior to backfill. However, landfill soils may be resting on Kellaways Sand or Cornbrash Formation.

Cont..

Sources	Possible Pathways	Receptors	Probability	Consequence	Risk Level	Comments	
Metals, metalloids, PAH, TPH and asbestos in Made Ground associated with backfilling of the 'Old Stone Pits' in the south-east (S2)	Ingestion, inhalation or direct contact.	Site users.	Low likelihood	Medium	Low	Evidence indicates backfilling of former earthworks as shown by 'old stone pits' on historical mapping. Possible Made Ground lateral and vertical extents, as well as nature of backfill is unknown. Soils may contain metals, metalloids, and PAH which may form the development platform. Given the age of the filling, it is unlikely that significant man-made constituents will be present in the part of the site.	Contact with these materials is likely in areas of Landscaping if used to create the development platform, or where remaining in situ. Mitigation measures may be required to break the SPR linkage.
	Inhalation of fugitive dust.	Neighbours.	Low likelihood	Medium	Low		The risk of significant generation of dust is likely only during site development process and can therefore be controlled.
	Leaching through unsaturated zone.	Groundwater and possible abstractors.	Low likelihood	Medium	Low		Where present the majority of the soils are resting on impermeable strata in this area (Blisworth Clay Formation) but may if not limestone has not been fully removed on the Cornbrash Formation. No groundwater abstractions within 1km of the site.
	Surface run-off.	Aquatic ecosystems. Surface water and possible abstractors.	Likely	Medium	Moderate		There is a drainage ditches in the north and centre of the site. Topography means that any surface water will flow from the pond towards Thorpe Brook.
	Base flow from contaminated groundwater.		Likely	Medium	Moderate		Migration of groundwater from Made Ground likely flows towards on-site pond through the Cornbrash Formation and Thorpe Brook via drainage ditches beyond.

Cont…

Sources	Possible Pathways	Receptors	Probability	Consequence	Risk Level	Comments	
Metals, metalloids, PAH, TPH and asbestos in Made Ground associated with construction fill at Castle Manor Farm and below access road construction (S3).	Ingestion, inhalation or direct contact.	Site users.	Likely	Medium	Moderate	Made Ground is likely present around Castle Manor Farm and associated access roads. Any source of Made Ground is unknown and may contain metals, metalloids and PAH.	Contact with these materials is likely in gardens and areas of Landscaping. Mitigation measures will be required to break the SPR linkage.
	Inhalation of fugitive dust.	Neighbours.	Low likelihood	Medium	Low		The risk of significant generation of dust is likely only during site development process and can therefore be controlled.
	Leaching through unsaturated zone.	Groundwater and possible abstractors.	Low likelihood	Medium	Low		Where present the majority of the soils are resting on the Cornbrash Formation. However, no groundwater abstractions within 1km of the site.
	Surface run-off.	Aquatic ecosystems. Surface water and possible abstractors.	Likely	Medium	Moderate		Pond adjacent to Castle Manor Farm with run-off likely to go from drainage ditches to Thorpe Brook offsite to the northeast.
	Base flow from contaminated groundwater.		Low likelihood	Medium	Moderate		Anticipated that the Cornbrash is thin in extent beneath Castle Manor Farm. However, groundwater likely to flow towards Thorpe Brook.
Petroleum hydrocarbons and VOC associated with ASTs in Castle Manor Farm complex (S4).	Ingestion, inhalation or direct contact.	Site users.	Likely	Medium	Moderate	Above Ground UST present in the north of Castle Manor Farm complex. Tank is bunded and resting on concrete base.	Contact with these materials is possible/likely and areas of Landscaping.
	Inhalation of Vapours.	Neighbours.	Unlikely	Medium	Low		Castle Manor Farm complex is located away from other developments.
	Leaching through unsaturated zone.	Groundwater and possible abstractors.	Likely	Medium	Moderate		Potential for free phase hydrocarbons in the soils and underlying groundwater. Underlying soils at surface at the Cornbrash Formation which is a Secondary A Aquifer. No groundwater abstractions within 1km of the site.
	Base Flow from contaminated groundwater.	Groundwater and possible abstractors.	Likely	Medium	Moderate		
	Direct contact	Water supply pipes.	Likely	Medium	High		Direct contact with buried water supply pipes is likely. mitigation may be required.

Sources	Possible Pathways	Receptors	Probability	Consequence	Risk Level	Comments
Ground gases (carbon dioxide and methane) from organic materials in the Landfill, Made Ground around Castle Manor Farm and the 'Old Stone Pits' (S5).	Migration, build up and asphyxiation.	Site users.	Likely	Medium to Severe	Moderate to High	Whilst landfill materials are 'inert' potential for organic materials within the soils. Further potential for organic materials within Made Ground soils around Castle Manor Farm and the 'Old Stone Pits'. Ground gas monitoring required to determine if materials if placed as part of development platform necessitates ground gas protection measures.
		Neighbours.	Likely	Medium	Moderate	
	Migration, build up and explosion.	Site users.	Likely	Medium to Severe	Moderate to High	
		Neighbours.				
		Buildings on site.				
		Buildings on adjacent sites.				
Asbestos fibres from insulation or asbestos-containing materials in the buildings and used around the farm (S6)	Fugitive dust.	On Site	Likely	Severe	High	Asbestos may be present in existing buildings and in Made Ground. Careful removal will be required from buildings during demolition. However, removal under controlled conditions should limit release of fibres to the air and the ground.
		Neighbours.	Unlikely	Severe	Low	

Cont..

Sources	Possible Pathways	Receptors	Probability	Consequence	Risk Level	Comments	
Pesticides and herbicides associated with historical farming practices (S7)	Ingestion, inhalation or direct contact	Site users.	Unlikely	Medium	Low	It is very likely pesticides and herbicides have been used on the site in the past. However, persistent chemicals are likely to be unlikely.	Contact with these materials is likely in limited areas of landscaping. However, over the majority of the site, the risk will be low as the proposed development will comprise hardstanding and building footprint.
	Inhalation of fugitive dust.	Neighbours.	Unlikely	Medium	Low		The risk of significant generation of dust is likely only during site development process and can therefore be controlled.
	Leaching through unsaturated zone.	Groundwater and possible abstractors.	Unlikely	Medium	Low		Soils of variable permeability present across site. No groundwater abstractors are currently within 1km of the site.
	Surface run-off.	Aquatic ecosystems.	Unlikely	Medium	Low		The topography of the site would cause surface water to run into on site drainage ditches.
	Base flow from contaminated groundwater.	Surface water and possible abstractors.	Unlikely	Medium	Low		Soils of variable permeability present across site.
Radon	Inhalation.	Site users.	No Linkage			BR211 indicates the site is in a low radon area and no radon protection is required.	