

Phase 1 Desk Study

The Lion - Gravesend



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Non-Technical Summary

What is Proposed?	It is understood that the site is proposed to be redeveloped to form an extended pub garden for The Lion, and to relocate access to the agricultural buildings beyond the east of the site (Vineyard Farms). The new entrance will be connected to a new HGV access way leading to the off-site farmyard, and a new pedestrian walkway to the pub garden. No buildings are proposed on site with external areas therefore comprising communal open space in the form of a pub garden, soft verges, and hardstanding access ways.
What is the Problem?	The following potential sources of contamination have been identified: ▶ Onsite – Long-term use as residential gardens and potential Made Ground from historical off-site demolition works. ▶ Onsite – Potential ACM within imported sub-base underlying existing concrete hardstanding ▶ Offsite – Adjacent Winery and agricultural development (Court and Brookers Farm / Vineyard Farms)
What is the Result?	In summary, this Phase 1 Desk Study has determined that there is unlikely to be significant contamination on site that would pose significant risk to the proposed development. Only low and very low risks have been identified to the various identified receptors, considering the proposed end use of a communal pub garden and access ways. The only elevated risks comprise: ▶ Moderate/low risk to construction workers from ACM within imported sub-base / Made Ground. However, this can be suitably mitigated through appropriate management and removal of hazardous soils/ materials.
What are the Next Steps?	This report should be submitted to the local planning authority to support the planning application. No further works or mitigation measures are considered necessary to ensure the proposed development is suitable for use from a land quality perspective. A Non-Specialist Watching Brief is always recommended during groundworks to identify any unforeseen contamination.

Report Record

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Client	Vineyard Farms Limited
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Report Revisions

Revision Ref	Date	Author	Details
RevA	Feb 2026	ME	Updated site plan to include HGV access

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1.0 Introduction

- 1.1 This report presents the findings of a Phase 1 Desk Study - a land contamination assessment that has been prepared in line with best practice guidance and planning policy.

What is a Phase 1 Desk Study?

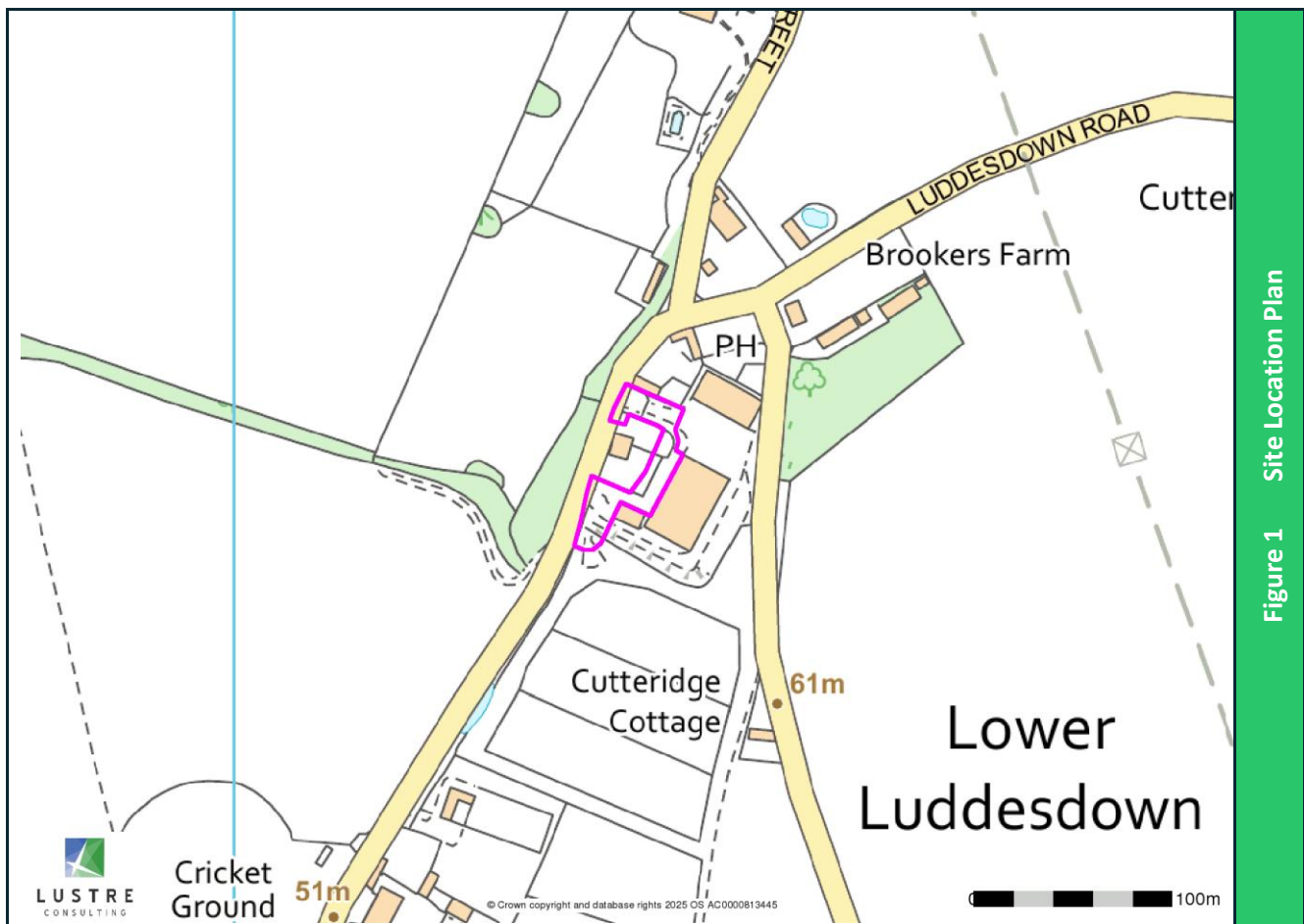
- 1.2 A Phase 1 Desk Study will determine if potential contamination is present at a site, and importantly, if that contamination poses a risk to future site users or the environment. If the Desk Study finds that the level of risk is unacceptable, you may need to further investigate with a Phase 2 Site Investigation and possibly undertake remediation.
- 1.3 The Phase 1 assessment will consider the historical and current uses of a site and understand its environmental sensitivity, within a conceptual site model (CSM). The report will provide risk ratings assigned to different components of the CSM and give actionable recommendations. Recommendations may include further investigation of any issues or ways to reduce the risk. If no unacceptable risks are identified, then typically no further environmental assessment is required. Find out more about Phase 1 Desk Studies [here](#).
- 1.4 Understanding and reducing the risks ensures that you have a safe and compliant site. When dealing with planning, the National Planning Policy Framework (NPPF) and associated policies require an appropriate land contamination risk assessment at the initial planning stage, whilst the Land Contamination Risk Management guidance (LCRM) requires a phased, risk-based approach when dealing with land affected by contamination in the UK. A Phase 1 Desk Study is the first part of that iterative investigation process.

The Subject Site

Table 1 Site Details	
Address	The Lion, Luddesdown Road, Gravesend, Kent, DA13 0XE
Eastings, Northings	567200, 166610
Area	0.16 Ha

- 1.5 The site currently comprises **two hardstanding access ways** and a **narrow grassy verge** connecting them, as shown in Figure 1. The western-most part of this central grassy verge constitutes **private garden space** associated with the two residential properties that bound the site to the west. The Lion pub garden extends from the north of the site and a large car park extends from the south. The commercial Court

and Brookers Farm yard (associated with Vineyard Farm Ltd and the Silverhand Estate) bounds the site to the east. The site is located within a rural agricultural area in the hamlet of Lower Luddesdown.



The Proposed Development

- 1.6 It is understood that the site is proposed to be redeveloped to provide an **extended pub garden** for The Lion and **alter access ways** to the adjacent pub and **farmyard (Court and Brookers Farm)**, as illustrated in Figure 2.
- 1.7 Proposed development plans involve the **relocation of the farmyard access point** (to Court and Brookers Farm) on Luddesdown Road from the north-west of the site to the south-west. The new entrance will be connected to a new HGV access way (related to adjacent farmyard) and pedestrian walkway (related to adjacent pub) proposed across the central area of the site. The northern-most portion of the site will be **converted to soft landscaping** to form an extension of the existing pub garden.
- 1.8 Part of the existing residential gardens along the western edge of the site will be redeveloped to form the pedestrian walkway, which will comprise a resin bound gravel pathway with vegetated soft verges

on either side. Alongside the pedestrian walkway will be a vehicular access track for HGVs leading to Brookers Farm. The south-western access point will therefore become the main access point for the overflow car park (beyond south of site) and Court and Brookers Farm adjacent to the east of the site.

- 1.9 No buildings are proposed on site with external areas comprising communal open space in the form of a pub garden, soft verges, and hardstanding access ways. There are no underground structures anticipated with below ground features limited to foundations and buried services.
- 1.10 Enabling works to permit the development are understood to involve the partial clearance of the site. It is understood that site levels will remain relatively similar to that present.





The Stakes & Objectives

- 1.11 The scope of works adopted in this Desk Study will address the following potential issues:
- ▶ Potential for contamination from historical site uses and nearby land uses through a review of available historical Ordnance Survey maps (dating back to the mid-1800s) and any existing information and reports relating to the site and surrounding area.
 - ▶ Potential for contamination from the current or contemporary site uses by undertaking a site walkover.
 - ▶ Sensitive receptors such as groundwater aquifers and geotechnical ground hazards through a review of published geological, hydrogeological and hydrological records.
 - ▶ Nearby environmentally sensitive areas such as protected groundwater bodies, surface water features etc through a review of available public information and up-to-date regulatory information from relevant authorities.
- 1.12 The objective of this report is therefore to determine the contaminative status of the site and to provide a general indication of the likely geoenvironmental issues which may be present. Information on likely geotechnical conditions and hazards is also included.

Report Structure, Limitations & Changes

- 1.13 The report structure generally follows the pollution linkage approach described above. Chapter 2 of the report provides information relating to the "sources" of potential contamination through a study of current and historical land uses, whilst the sensitivity and anthropology information in Chapter 3 relates to the "receptors" and "pathways" components. Report conclusions and recommendations, including a summary of the conceptual site model and risk assessment Appendix, are set out in Chapter 4.
- 1.14 This Phase 1 Desk Study has been undertaken in accordance with our Terms & Conditions. Full details on limitations and reliance are provided in those Terms. Third party information which has been reviewed and used to inform the assessments presented herein, including public records held by various regulatory authorities and environmental database data has been assumed to be true and accurate.
- 1.15 This assessment has been carried out to determine the potential risks posed to future end users, along with other key receptors, based on the current development. Should revisions in the development proposals result in a change any assessment parameters detailed in this report, a re-assessment of the risk should be carried out.

2.0 Land Use

- 2.1 This chapter identifies and provides information on any potential on-site and off-site "sources" of contamination within the source-pathway-receptor model. The chapter includes a review of information obtained from photographic records, publicly recorded information on environmental issues and controls within relevant distances of the site (which may indicate the presence of potential source(s) of contamination, such as licensed landfills), available planning records obtained from regulatory websites and OS historical mapping. A summary of the identified sources and potential contaminants are given at the end of the chapter.

Site Description

- 2.2 A site walkover was undertaken by a qualified consultant from Lustre on 29th May 2025. The majority of the site was accessed, however the gardens of the adjacent residential properties and the green shipping container observed on site were not accessible.



Figure 3 Existing Site Plan



Northern site access



Proposed walkway area from north

- 2.3 The northern portion of the site formed **access** to a yard area associated with **Court and Brookers Farm** (Vineyard Farms Ltd) adjacent to the east of the site. This portion comprised a concrete track with soft grassed verges on either side. Several large commercial bins were observed along the southern side of the track, likely associated with the adjacent agricultural activities. The pub garden of The Lion bound the site to the north.
- 2.4 A double metal gate and wooden fence was present in this northern area, denoting access to Court and Brookers Farm (Vineyard Farms / Silverhand Estate Winery) beyond the eastern boundary of the site. The grassy verge to the south of the access track curved south where the track met the yard, leading to a narrow grassy verge between the two residential properties along the western boundary of the site and the large warehouse along the eastern boundary. This **narrow grassed area** is proposed to become the new walkways connecting the northern and southern areas of the site.
- 2.5 Trees lined the western side of the verge, separating it from the adjacent offsite residential properties. The boundary of the site extends into the **private gardens** associated with these properties; however these gardens were not accessed. A **green shipping container** was present within the south of this narrow grassy verge, blocking the proposed walkway route. The container was not accessed, however anecdotal evidence from the site manager provided after the walkover suggested that the container was only used to store PPE and uniform associated with the adjacent commercial yard.
- 2.6 The southern portion of the site mainly formed another hardstanding access route to Court and Brookers Farm beyond the east of the site. A small farm building was present along the south-eastern boundary of the site (off-site), separating the proposed walkway area from the adjacent off-site

commercial yard. The walkway opened into the southern portion of the site, to the west of the green shipping container and small off-site warehouse. Within this northern area of the southern portion, there was an area overgrown with vegetation, where an **excavator and stockpile of aggregate** was being stored at the time of the walkover. The southern-most point of the site formed the entrance of a **large car park** that appeared to be under construction at the time of the walkover.



Overgrown area in south of site



Southern-most area of site

Storage of Fuels & Hazardous Material

- 2.7 Lustre has not been made aware of, or observed, any evidence of current or former bulk hazardous material storage on site.
- 2.8 No small-scale hazardous materials were observed on site. The shipping container was not accessed; however anecdotal evidence does not suggest that it was used to house hazardous materials.

Waste

- 2.9 No waste appeared to be generated on site, however several large commercial wheelie bins were present within the northern portion of the site, likely associated with the off-site adjacent commercial scheme. Given the labelling of the bins, this commercial waste is likely taken away by a licensed waste carrier.

Drainage

- 2.10 Only surface water run-off is generated on site, from hardstanding or from the roof of the shipping container, or off-site buildings. No evidence of formal drainage was observed on site; however manholes

and drainage channels were recorded off-site at the adjacent commercial development. Existing drainage plans were not made available for viewing.

- 2.11 No surface water features were recorded on site.

Potential Off-site Sources / Points of Interest

- 2.12 Along the northern boundary of the site was the **pub garden of The Lion**, with two shed-like structures backing onto the site. The pub garden is approximately 2m lower than the site, with a **retaining wall** along the northern boundary of the site.
- 2.13 As mentioned previously, **two residential properties** are located along the western boundary of the site, with the site overlapping the eastern-most area of the associated private gardens. Farm buildings used for wine making are situated along the eastern boundary of the site.



Winery plant adjacent to site boundary



Off-site winery plant

Further Surveys

- 2.14 Whilst the site walkover discussion may reference observations regarding the presence of features/issues such as invasive species, ACM, site drainage and evidence of structural abnormalities, this report does not constitute specialist surveys on these matters. Should further specialist surveys be carried out in this regard, the findings of these should be reported to Lustre so that we may determine if this has any discernible impact on the findings of this report.



Public Record Information

- 2.15 Information on potentially significant environmental issues and controls at the site and surrounding area may be held on public records by various regulatory authorities. Information referenced in this Chapter has been sourced directly from the regulatory authorities and from the Landmark database (data summarised within relevant distances of the site centre). A copy of the Envirocheck report is attached at Appendix A. A summary of the significant environmental issues and controls in the Envirocheck report is summarised in the following table.

Table 2 Regulatory Information	
Public Record	Features
Environmental Permits and Controls	No Local Authority Pollution Prevention and Controls or Integrated Pollution Prevention and Controls have been identified within 250m of the subject site.
Pollution Incidents to Controlled Waters	No pollution incidents to controlled waters have been identified within 250m of the subject site.
Hazardous Substances	There are no hazardous substances (e.g. Control of Major Accident Hazards (COMAH), Notification of Installations Handling Hazardous Substances (NIHHS) or Planning Hazardous Substance Consents) recorded within 250m.
Landfill Sites	None of the following landfill sites have been identified within 1km of the subject site: BGS recorded landfill sites, historical landfill sites, Local Authority Recorded Landfill Sites and registered landfill sites.
Waste Management Facilities	No Licensed or Registered Waste Management / Transfer / Treatment / Disposal Facilities have been identified within 250m of the subject site.
Contemporary Trade Directory Entries	No Contemporary Trade Directory Entries have been identified on site or within 250m of the subject site.
Petrol Filling Stations (PFS)	No fuel station entries have been identified within 250m of the subject site.

Review of Regulatory Information

- 2.16 A review of the planning records held by Gravesham has revealed several planning applications for the site, associated with the wider Court and Brookers Farm (Vineyard Farms Ltd) development adjacent to the east of the site. Although no environmentally pertinent information was uncovered, the selected applications below provide further context on the history of the agricultural scheme adjacent to the east of the site.
- ▶ 19880177 – ‘Erection of two agricultural buildings to form grain store, workshop/general purposes building.’ (Dated 1988). Documentation suggests that an agricultural development was present on site prior to this application, named Luddesdown Organic Farms Ltd



- ▶ 20210607 – ‘*Retrospective application for erection of two storage/fermentation tanks*’ (Dated 2021). Application confirms the presence of Vineyard Farms Ltd on site around 2021.
- ▶ 20240091 – ‘*Engineering works to construct a formal car parking area for Vineyard Farms Ltd office, winery and vineyard workers, and other users of Brookers Farm*’ (Dated 2024). Application concerns the overflow car park situated beyond the south of the subject site.

Site History

- 2.17 The site history has been assessed by reviewing historical Ordnance Survey maps provided by Landmark and aerial photographic imagery from Google Earth. Relevant maps are reproduced in Appendix B. The historical development of the site and the surrounding area are summarised in the following section. Where features are identified as having a potential impact on the proposed development, an indication of potential contaminants has been provided at the end of the Chapter.
- 2.18 It is noted that the mapping process adopted in generating the historical Ordnance Survey records (mapping intervals/frequency, scale, inclusion/exclusion of features etc), may result in an incomplete account of a site’s history. Changes in land use between mapping dates, or small yet potentially contaminative land uses, may not be identified from the records. The following account is therefore based solely on the information provided in the mapping records and the dates listed should be considered as approximate.

On Site History

- 2.19 The earliest available mapping records of the site are from 1894 and display the site to comprise **undeveloped land** with **woodland or orchard** in the south. Several structures are present around the northern perimeter of the site, appearing to **overlap the site** slightly.
- 2.20 By 1909 the buildings that overlap the site appear have been cleared. The central part of the site (proposed location of walkways) appears to form part of a **residential garden** / open land that serves two off-site residential houses 10m east. Currently the western-most portion of the proposed walkway area remains as gardens associated with these houses.
- 2.21 The site appears to remain as open/undeveloped land until ariel imagery from 1990 displays the **hardstanding access ways** currently present. The green shipping container observed on site, appears to have been present since 2023.



- 2.22 Aerial imagery from 2007 and 2015 illustrates a potential lean-to structure within the proposed walkway area of the site associated with the adjacent off-site warehouse. This structure may have served as an external storage area or perhaps a smoking area for site workers. The 2007 imagery indicates that the walkway may have been used as temporarily as an informal track connecting the northern and southern parts of Court and Brookers Farm.

Offsite History

- 2.23 The earliest available mapping records of the area are from 1894 and show the area surrounding the site to predominantly comprise undeveloped rural land and farmland, as it remains currently. Buildings associated with the hamlet of Lower Luddesdown extend from the north of the site and a couple of residential developments are noted within 250m, including the Rectory 180m south-west and Henley Croft 185m north. Environmentally pertinent historical information from the immediate surrounding area (within 250m) has been summarised below.

Table 3 Off Site History			
Off Site Land Use	Distance from site (m)	Date Features Present	Date Features Removed
Building (unknown purpose)	Adjacent W	1894	1909
Structures – present as sheds in The Lion pub garden	Adjacent NW	1894	Present
Building (possible agricultural barn)	Adjacent E	1894	1963
Above replaced with larger building and small structures (anticipated agricultural use)	Adjacent E	1963	2006
Above replaced by large warehouse and small store associated with Court and Brookers Farm	Adjacent E	2006	Present
Residential houses and gardens	10m E	1909	Present
Public House – currently The Lion	30m North	1894	Present
Brookers Farm - building present 1894 but label present from 1963	65m NE	1894 / 1963	Present

Summary of Identified Potential Sources of Contamination

- 2.24 This section has assessed both the current and historical uses of the site and surrounding areas, as well as publicly available regulatory information. In accordance with the LCRM guidance, this assessment has allowed potential sources of contamination to be identified.
- 2.25 Viable potential sources of contamination which have been carried forward into the conceptual model and risk assessment are set out below.



On-Site Sources

- 2.26 Periods of construction and demolition are not noted on site in historical mapping records, however given the previous development works along the boundaries of the site, waste demolition materials may have been spread across the subject site to form **Made Ground**. For example, a building was historically present along the western boundary (prior to the existing residential properties) and various structures were noted along the eastern boundary through the years. Waste materials from these off-site works may have been tracked onto the subject site, and may contain contaminants such as asbestos, metals, PAHs and inorganics. The use of the land in the west of the central section as **residential gardens** could also have resulted in soil contamination with identical contaminants.
- 2.27 Furthermore, when the hardstanding was installed on site, a **sub-base material** was likely imported onto the site to underlie the concrete, which may contain contaminants. Ariel imagery suggests that the hardstanding was constructed before 1990, prior to strict asbestos regulations, and therefore the sub-base, especially if it is made up recycled crush, may contain **asbestos**. Where the hardstanding is proposed to be removed from the north portion of the site, to form the soft landscaped pub garden, the sub-base and any associated contamination will be exposed posing a health risk from dust and direct contact, but also potential hazardous waste.
- 2.28 No other viable sources have been identified on site. No bulk or small-scale hazardous material storage was observed on site, and Lustre has not been made aware of any such storage historically present on site.

Off-site Sources

- 2.29 The only off-site source considered as viable is the ongoing agricultural use of the land to the east of the site. It is anticipated that this area has been used for agriculture since at least the 1960s, and possibly earlier. It now comprises **Court and Brookers Farm** including an active winery (owned by Silverhand Estate), a yard area, warehouse and stores (associated with Vineyard Farms). During the site walkover, **storage tanks, plant and crates of chemicals** were observed across the Court and Brookers Farm site. Potential contaminants include TPH, PAHs, metals, vapours, solvents and inorganics.



3.0 Sensitivity & Anthropology

Introduction

- 3.1 This chapter provides information relating to on-site and off-site 'pathways' and 'receptors' and includes a review of the geology, hydrogeology, hydrology and ecological setting of the site. A general assessment and review of the site anthropology, such as identified human / built environment receptors, including current and future site occupiers, below ground structures, flora etc is also provided. A summary of identified receptors and site-specific pollutant linkages is given at the end of the chapter. Any pathways (contaminant migration, exposure pathways), which can be discounted in conceptual terms (i.e. considering the unviable nature of the pathway given the proposed development setting or local geology/hydrogeology etc), are discussed at the end of the chapter.

Geology

- 3.2 The 1:50,000 British Geological Survey (BGS) map (Sheet 271)¹ and the BGS website (National Geoscience Information Service)² show the site to be directly underlain by superficial deposits of **Head** comprising gravel, sand and clay with lenses of silt. The bedrock geology is listed as the **New Pit Chalk Formation** comprising blocky white firm to moderately hard chalk with numerous marls or paired marl seams.
- 3.3 Bedrock of the Lewes Nodular Chalk Formation is also present within the vicinity of the site. The site is situated on a geological fault line that runs south-west to north-east. The fault does not appear to separate two vastly different geological units and is contained within the Chalk geologies.
- 3.4 Periods of construction and demolition are not noted on site in historical mapping records, however given the previous development works along the boundaries of the site, waste demolition materials may have been spread across the subject site to form a layer of **Made Ground** on site. Furthermore, a **sub-base material** is anticipated to be present underlying the concrete hardstanding on site.
- 3.5 Historical borehole records have been identified relating to boreholes drilled within the general vicinity of the site and surrounding area. The closest historical borehole was recorded approximately 110m

¹ BGS Solid and Drift Map Sheet 271

² Information from BGS website: www.bgs.ac.uk consulted in month of report issue



north-east of the site (TQ66NE144). A summary of ground conditions encountered is provided below and a copy of the borehole log is included in Appendix C.

- ▶ Topsoil from surface level to 0.30m bgl
- ▶ Head: Firm brown slightly sandy clayey SILT with much rounded flint and chalk. From 0.30m to 0.85m bgl
- ▶ Coombe Deposit: Firm dense brown calcareous clayey SILT with white chalk and flint gravels. – 0.85m bgl to 1.90m bgl
- ▶ Middle Chalk: hard off-white chalk easily puttified.
- ▶ Chalk to 8.60m bgl where borehole terminated.
- ▶ Groundwater was not recorded on the log.

- 3.6 This historical borehole log provides confirmation that a thickness of superficial deposits is present within the site area, and that shallow groundwater (within 5m bgl) is not anticipated beneath the site, within the superficial deposits or bedrock.

Ground Hazards

- 3.7 BGS data has also been reviewed to determine potential ground stability hazards which may affect the site. The table below summarises the ground stability hazards anticipated on the subject site based upon the expected ground model.

Table 4 Ground Hazards On-Site	
Hazard Type	Hazard Potential
Coal Mining Affected Area	None
Non-Coal Mining Affected Area	Rare
Potential for Collapsible Ground Stability Hazards	Very Low
Potential for Compressible Ground Stability Hazards	No Hazard
Potential for Ground Dissolution Stability Hazards	Very Low
Potential for Landslide Ground Stability Hazards	Low
Potential for Running Sand Ground Stability Hazards	Very Low
Potential for Shrinking or Swelling Clay Ground Stability Hazards	Very Low

- 3.8 The BGS also holds data on non-coal mining areas, natural cavities and radon, and the Coal Authority holds data on coal mining affected areas for the UK. Data collated by Landmark on these matters (sites/features within 1km of the subject site) are presented below.



Table 5 BGS Sites & Radon	
Category	Details
BGS Recorded Mineral Sites	No BGS Recorded Mineral Sites have been identified within 1km of the subject site.
Man-Made Mining Cavities	No man-made mining cavities have been identified within 1km of the subject site.
Natural Cavities	No natural cavities have been identified within 1km of the subject site.
Radon Potential - Radon Affected Areas	The property is in an Intermediate probability radon area (1 to 3% of homes are estimated to be at or above the Action Level) where no radon protective measures are necessary in the construction of new dwellings or extensions.

Hydrogeology

- 3.9 The Groundwater Vulnerability Map of England and the DEFRA website³ have been reviewed to determine the aquifer designations.
- 3.10 The Head Deposit is designated as a **Secondary (undifferentiated) aquifer** which is defined by the Environment Agency as an aquifer where "it has not been possible to attribute either category A or B to a rock type. In most cases, this means that the layer in question has previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type." Based on the BGS information reviewed, it is considered that this geology has varying permeability due to its variable composition, and as such a shallow groundwater body is not anticipated. Limited discontinuous perched groundwater may be present within more granular lenses of this stratum but is anticipated to be of low value and significance.
- 3.11 The New Pit Chalk Formation is designated as a **Principal aquifer** which is defined by the Environment Agency as "layers of rock or drift deposits that have high intergranular and/or fracture permeability - meaning they usually provide a high level of water storage. They may support water supply and/or river base flow on a strategic scale. In most cases, principal aquifers are aquifers previously designated as major aquifer." Based on the BGS information reviewed, it is considered that the bedrock is relatively permeable and so shallow groundwater is not anticipated, however a deep aquifer is likely present.
- 3.12 The Environment Agency has defined Source Protection Zones (SPZs) for groundwater sources used for public drinking water supply.⁴ A groundwater source protection zone is present on site: **Zone 2 (Outer**

³ Information from DEFRA Website: www.magic.defra.gov.uk consulted in month of report issue

⁴ These zones show the risk of contamination from any activities that might cause pollution in the area. The maps show three main zones (inner, outer and total catchment) and a fourth zone of special interest.



Zone) and is anticipated to relate to groundwater abstractions from the Chalk formations that underlie the area.

3.13 The ground has been classified as having a very significant risk with **moderate possibility of soluble rock risk**. This will be due to the presence of chalk with overlying superficial deposits which could result in the formation of natural cavities and solution features.

3.14 **Three groundwater abstractions** are recorded within 1km of the site:

- ▶ 915m west - Operated by Southern Water Services Ltd (Luddesdown Ps) and pertains to the abstraction of groundwater for public water supply, under licence no. 01/026.
- ▶ 931m west x2 - Operated by Southern Water Services Ltd (Lower Greensand Boreholes, Wells And Adits At Luddesdown Ps) and pertains to the abstraction of groundwater for public water supply: potable water supply - direct, under licence no. 9/40/01/0511/G.

3.15 No groundwater discharge consents are recorded within 250m of the site.

Hydrology

3.16 The nearest surface water feature is located 82m south-west and relates to a pond. Considering the underlying geology/ ground conditions and the local topography, this surface water feature could be in hydraulic connectivity with the site.

3.17 In addition to the above-mentioned pond, within 500m of the subject site, two more small ponds have been identified. These off-site surface water features are unlikely to be in hydraulic connectivity with the site given the isolated nature of the ponds and the anticipated absence of a shallow groundwater body. **No significant surface water features have been identified within 500m of the site.**

3.18 Two surface water abstractions are recorded within 1km of the site:

- ▶ 911m west - Operated by Southern Water Services Ltd (Luddesdown Pumping Station, LUDDESDOWN) and pertains to the abstraction of pond or lake for flow augment, under licence no. 1/0511/E/G.
- ▶ 952m south-west - Operated by Southern Water Services Ltd (Luddesdown Pumping Station, LUDDESDOWN) and pertains to the abstraction of pond or lake for public water supply, under licence no. 1/0511/C/G.



- 3.19 No surface water discharge consents are recorded within 250m of the site.

Flood Risk

- 3.20 BGS flood data shows the site to lie within an area with limited potential for groundwater flooding to occur.
- 3.21 A large proportion of the site is shown to be at **high risk** of flooding from surface water, with a 30-year flood return, which represents a 3.3% annual exceedance probability. However, it is noted that the site is located in **Flood Zone 1**, which are the areas least likely to experience flooding from rivers or sea.

Environmental Statutory Designations

- 3.22 A review of the environmental sensitive receptors' database indicates that the site **is not** located within a highly ecologically sensitive area. There are no Special Protection Areas, Sites of Special Scientific Interest, Ramsar Sites, Local Nature Reserves, Environmentally Sensitive Areas within 250m of the site.
- 3.23 It is noted that the site is located within an **Area of Outstanding Natural Beauty** called the Kent Downs.
- 3.24 The site lies within a Nitrate Vulnerable Zone concerning the groundwater in North Kent.

Environmental Sensitivity

- 3.25 The sensitivity of each of the identified receptors is rated depending upon the environmental setting of the site, the likelihood for pollutant linkages to be present and potential consequence of those potential pollutant linkages. The assessment approach adopted is based on guidance set out in the *NHBC R&D 66*⁵ document.
- 3.26 Groundwater within the Head is considered to have a **Low (L1) sensitivity**, which is described in the guidance as being a "permeable strata/minor aquifer near surface, but no apparent use and low vulnerability (may also be a significant aquifer but downgraded by long term/ permanent degradation of water quality). May provide pathway to surface watercourse at distance." This sensitivity classification has been assigned given the expected variable permeability and limited potential for groundwater storage and transmission within the Head Deposit.

⁵ Guidance for the Safe Development of Housing on Land Affected by Contamination R&D66, NHBC, 2008



- 3.27 Groundwater within the New Pit Chalk Formation is considered to have a **High (H2) sensitivity**, which is described in the guidance as being a "major or minor vulnerable aquifer with probable use nearby (either direct abstraction or baseflow to sensitive watercourses and springs). Likely to be within Outer or Source Catchment protection zones (Zones II or III). Most contaminant releases to the ground environment of concern." This sensitivity classification has been assigned given the designation of the site area as within a groundwater SPZ II (Outer Zone), the presence of groundwater abstractions approximately 900m away, and the expected permeability and potential for groundwater storage of this stratum as a Principal aquifer.
- 3.28 Surface water is considered to have **Low (L1) sensitivity**, which is described in the guidance as being "within catchment of and over 250m from generally poor quality watercourse (GQA E or F) that is unlikely to improved by current or foreseeable surface water quality objectives or at distance (over 1000m) from a good quality watercourse with no interconnecting drains or baseflow from fissured strata." This sensitivity classification has been assigned given the presence of small ponds within proximity of the site, but the absence of significant surface water features within 500m of the site.
- 3.29 The site is considered to have a **moderate/low ecological sensitivity** given the absence of any statutory designated ecological receptors either on-site or within proximity to the site, but also the presence of an Area of Outstanding Natural Beauty on site.
- 3.30 The sensitivity classifications noted above have been taken into consideration in the development of the conceptual model presented at the rear of this report.

Anthropology

- 3.31 Proposed anthropological receptors at the site are considered to include future site users such as Vineyard Farms staff, pub staff and customers/visitors using the car park, proposed walkway, and pub garden. In the short term, groundworkers and construction personnel will also be considered.

Summary of Identified Receptors & Site-Specific Pollutant Linkages

- 3.32 A review of the environmental sensitivity and proposed anthropological use of the site has identified the following **receptors**, as detailed below.

Identified Receptors

- ▶ Staff, customers and visitors,



- ▶ Ground / construction workers,
- ▶ Perched groundwater within Made Ground and Head Deposits,
- ▶ Deeper groundwater within the New Pit Chalk Formation (Principal aquifer),
- ▶ Surface water,
- ▶ Adjacent land,
- ▶ Flora,
- ▶ Below ground structures.

Viable Pathways and Pollution Linkages

3.33 A number of **viable migration and exposure pathways** and potential pollutant linkages have been identified, whereby a receptor may be exposed to a source. The viable pollutant linkages have then been used to develop a conceptual model. The following is a summary of **viable**, site specific pathways and pollutant linkages to be considered further:

- ▶ In areas of open ground, the following exposure pathways to humans are considered to be active: inhalation of contaminated dust and dermal contact and direct ingestion of contaminated soils. It is noted that these exposure pathways are only active in soft landscaped areas; permeant hardstanding breaks the potential pathways.
- ▶ Inhalation of toxic vapours, potentially migrating into above ground structures from organic contaminants within the Made Ground, contaminated groundwater or localised spills / leaks. Potential for vapours to migrate through hardstanding and open ground.
- ▶ Hazardous ground gases, potentially generated by the Made Ground or organic-rich natural soils or off-site sources, may migrate into above ground structures and accumulate within building voids and enclosed spaces (resultant risk of asphyxiation and / or explosion).
- ▶ Shallow soil contamination has the potential to vertically migrate downwards into the underlying natural soils and perched or shallow groundwater by leaching and infiltration. These processes are enhanced in areas of soft landscaping due to an increased infiltration potential. Conversely, areas of hardstanding reduce infiltration potential and leaching rates, which results in a lower mobility of any shallow contamination.
- ▶ Lateral migration of site-borne contaminants to off-site areas (down hydraulic gradient), via surface water runoff and baseflow. Lateral migration of potentially contaminated shallow groundwater from off-site areas (up hydraulic gradient), impacting on-site groundwater.



- ▶ Flora grown within areas of soft landscaping may be exposed to contaminants through root uptake mechanisms.
- ▶ Below ground concrete structures are susceptible to chemical attack from aggressive ground conditions (pH and water-soluble sulphate).

Notes on Pathways and Pollution Linkages

3.34 The following site-specific pathways and pollutant linkages are not considered to be viable, and therefore discounted from the conceptual model and risk assessment:

- ▶ The superficial Head Deposits have **variable permeability** due to it containing varying compositions of clay, sand, silt and gravel. As such this stratum is not anticipated to be a viable groundwater aquifer capable of storing or transmitting significant quantities of groundwater. Any groundwater present will likely be held within discontinuous more granular lenses and be of limited value and low significance. The potential for significant mobilisation of contamination within this stratum is therefore low. As such, the potential for vertical mixing of shallow groundwater to deeper groundwater is reduced. This will also limit the potential for the lateral migration of site-borne contaminants to off-site areas (down hydraulic gradient) via baseflow. The migration of potential sources of off-site contamination and ground gases onto the site is also likely to be restricted noting the above.
- ▶ Private gardens are not included within the development proposals and therefore the following pollutant linkage has been discounted: indirect ingestion of contaminated soils sorbed to home-grown produce.
- ▶ It is understood that no potable water pipes will be installed as part of the redevelopment, as no new buildings are proposed.
- ▶ The pathway of 'Migration and accumulation of gases within building voids and enclosed spaces' has been discounted as no buildings or aboveground structures are proposed.



4.0 Conclusions & Next Steps

- 4.1 The information presented in the previous chapters have been compiled and used to create a conceptual model and qualitative risk assessment. The CSM and risk assessment is presented at the end of this Chapter.
- 4.2 The risk ratings assigned in the risk table, and summarised below, are based on information obtained through desk-based research, a site walkover and on our experience in assessing risks from similar sites. The proposed end use of the site, anticipated ground conditions, environmental receptors and viable exposure pathways have been considered.

Geoenvironmental Risk Ratings

- 4.3 In summary this Phase 1 Desk Study has determined that there is **unlikely to be contamination** present on site in a circumstance that could result in widespread adverse impacts to the identified receptors. Most of the risks were determined to be low and very low, as displayed in the Conceptual Site Model (CSM), however a **Moderate/Low risk to ground and construction workers** has been identified.
- 4.4 No evidence of potentially contaminative activities having taken place on site in the recent past has been identified, with its uses limited to relatively low risk activities such as residential gardens, an informal walkway and access tracks. **Made Ground** may be present across the site from off-site historical demolition works that may have spread waste materials onto the adjacent subject site. Furthermore, the off-site winery and agricultural development adjacent to the east of the site may also pose a risk of contamination. However, considering the low sensitivity of the proposed end use of a pub garden and access ways, the risk to most identified receptors is considered **acceptably low**.
- 4.5 The main contaminative issue identified concerns the imported **sub-base material** on site underlying the hardstanding. Where the sub-base was likely installed prior to 1990, there is a risk that it could contain contaminants such as asbestos. Where the hardstanding is proposed to be removed from the north portion of the site, to form the soft landscaped pub garden, the sub-base and any associated contamination will be exposed, posing a risk to ground and construction staff working on the site. It is anticipated that any hazardous soils / materials will be appropriately managed and removed, so **that no contamination or ACS (asbestos containing soil) is left within the pub garden area**.
- 4.6 It is important to remember that the qualitative nature of the risk assessment is not absolute. Even if very low and low risks have been assigned to pollutant linkages, the risk cannot be eliminated (i.e. "no



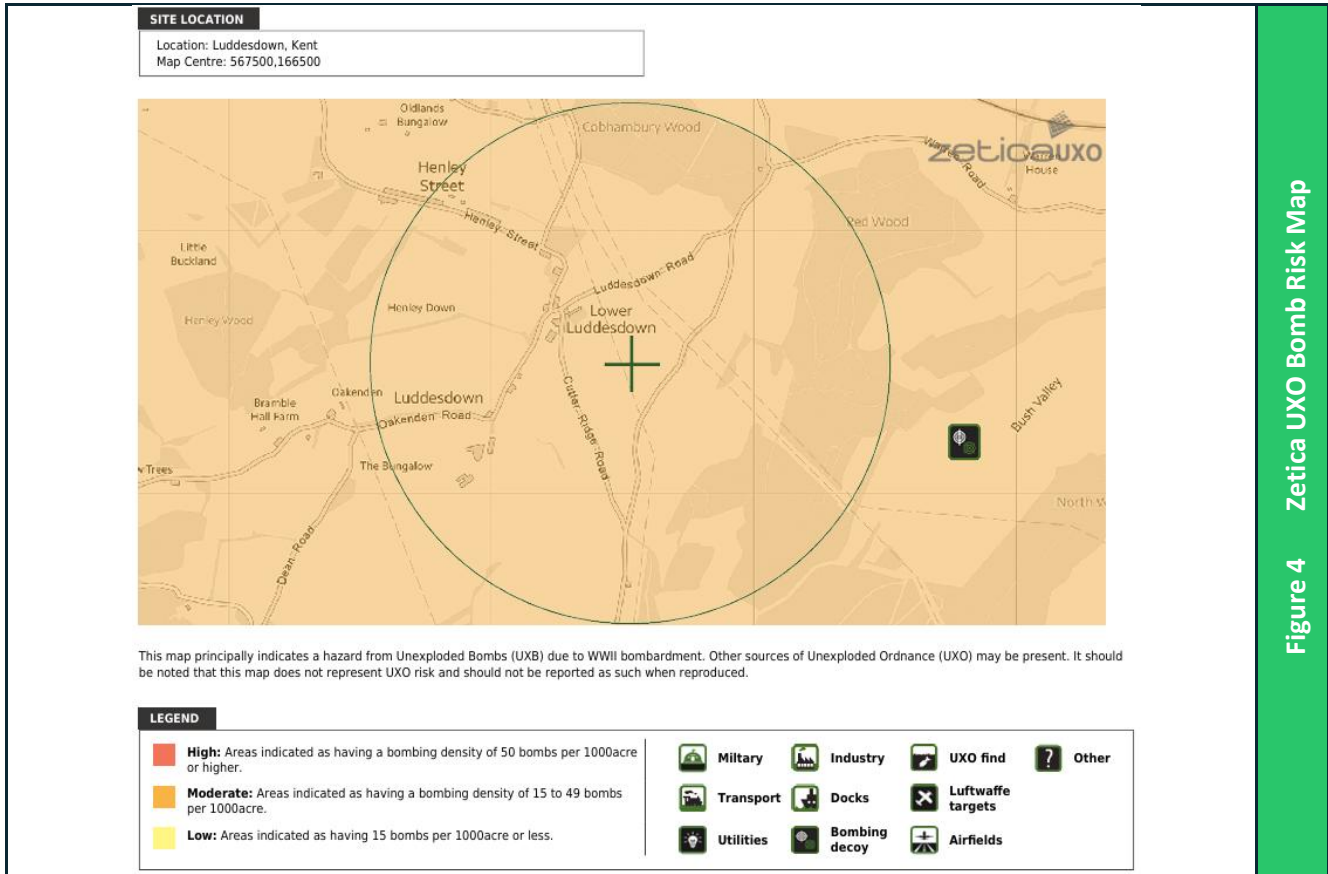
risk”) at this stage of the assessment. Residual risks will remain and should not be disregarded on the basis that the risk is low.

Planning Considerations & Next Steps

- 4.7 It is understood that this report will be submitted to the local planning authority to support the planning application.
- 4.8 Based on the findings of this assessment **no further investigation works or specific mitigation measures are required** to ensure the proposed development is suitable for use from a land quality perspective.
- 4.9 The moderate/low risk to ground and construction workers from the potentially contaminated sub-base, is best managed through the preparation of a detailed Construction Environment Management Plan and a thorough Health and Safety Plan, identifying the potential risks from contamination. It is anticipated that any hazardous soils / materials will be appropriately managed, removed and disposed so that no contamination such as asbestos containing soils (ACS) is left within the pub garden area.
- 4.10 It is recommended that a **Non-Specialist Watching Brief** is maintained during the groundworks and construction phase to monitor for any visual or olfactory evidence of contamination. This can form part of toolbox talks so potential contamination can be identified. Should unforeseen contamination be identified, works in that area should stop and Lustre be contacted to assess the suspected contamination.

Advisory Matters

- 4.11 Aside from land contamination issues that require consideration under the planning regime, the findings of this assessment impact other aspects of building design and construction. These items often require action to ensure that you continue to have a safe and compliant site and include matters such as ground hazards foundation design, waste soil classification etc.
- 4.12 A Flood Risk Assessment should be considered given the **flood risk** from surface water identified on site.
- 4.13 Zetica UXO bombing density maps show that the site was in an area of Moderate bombardment during WW2. As such there is an elevated risk of UXO discovery during works on site. Further assessment of the risk from UXO on the site could be considered to mitigate this



Preliminary Ground Model & Ground Hazard Recommendations

- 4.14 The BGS information shows that the site is underlain by superficial deposits of Head and bedrock of the New Pit Chalk Formation.
- 4.15 Considering the information from the BGS reviewed as part of this Phase 1, discontinuous perched groundwater may be present beneath the site, but not a formal shallow water table. A deeper aquifer is anticipated within the Chalk, the depth of which could not be established as part of this assessment.

Comments on Waste Classification

- 4.16 Separate to the human health and wider environmental risks from potential contamination, the presence of some contaminants can also impact the waste spoil disposal costs. Depending on the chemical composition of any Made Ground, soils may require different disposal routes. Should there be a need for the disposal of soils as part of the development, the waste producer should undertake a waste spoil assessment. This must include an assessment of the hazardous nature of the soil by virtue of any contamination (in accordance with the Waste Framework Directive and the Environment



Agency's *Technical Guidance WM3 Hazardous Waste*⁶), and possibly Waste Acceptance Criteria (WAC) testing.

Statutory Designation

- 4.17 The National Planning Policy Framework (NPPF) states that “land should be suitable for its new use and as a minimum, after carrying out remediation (if required), the land should **not** be capable of being determined as contaminated land under Part 2A of the Environmental Protection Act 1990”. It is our opinion that, based on the findings of this Phase 1 Desk Study, it is unlikely the site would be designated as statutory contaminated land by the Local Authority under the provision of the published Statutory Guidance. It is advisable however, that any recommendations made in this report are implemented in line with current guidance and good practice.

⁶ Technical guidance WM3: Guidance on the Classification and Assessment of Waste (1st Edition 2015). Environment Agency.



Conceptual Site Model

ENVIRONMENTAL RISK ASSESSMENT

Introduction

This section assesses the significance of the environmental issues that have been identified on the site or in the surrounding area. This is achieved by developing an initial conceptual model for the site and undertaking a qualitative risk assessment.

The objective of the conceptual model is to identify potential contaminant “source(s)”, “pathways” and target “receptors” relating to the site and surrounding area. The information obtained is described in detail in the Land Use Chapter and the Sensitivity & Anthropology Chapters. This information is then collated and a qualitative risk assessment^{7,8} undertaken to assess the source-pathway-receptor linkages. The potential for a pollution event to occur is evaluated using a risk classification tool⁹. The level of risk is assigned by considering the likelihood that a pollution event might occur with the consequence of its occurrence. The consequence is essentially a measurement of the severity of a hazard (or source) and sensitivity of the receptor (e.g. aquifer type or end user).

The Table presented overleaf details the various components of the site conceptual model and evaluates the risks associated with each viable potential pollution linkage. Where additional explanation is required, Justification Notes have been given at the end of the Table. The risks associated with each potential pollution linkage are also discussed within the report conclusions.

Methodology

The qualitative risk assessment firstly considers the source of contamination and potential contaminants associated with the source(s) (or hazards). As well as the type of source, the extent, concentration and availability of a contaminant is also assessed.

The effect of a hazard on an identified receptor is largely governed by the sensitivity of a receptor. Receptors may typically include people, buildings, animals, plants and local resources (such as groundwater, surface waters, mines etc). A change in the receptor should be considered if the end-use of the site changes, for example, if a commercial site is to be redeveloped into a residential housing estate as a residential occupier is considered more sensitive than a commercial occupier. The presence of contamination (as a potential hazard) does not necessarily mean that there is a risk. It is the exposure pathway and the quantity of contamination that reaches the receptor which may determine the effect on a receptor (such as the integrity of a barrier between a contamination source and receptor).

The risk classifications for both likelihood and consequence is based on methodology presented in Contaminated Land Risk Assessment, A Guide to Good Practice (CIRIA C552, 2001) and has been developed from procedures outlined in the EA's LCRM. The Department for the Environment Transport and the Regions (DETR), with the EA and Institute of Environment & Health, has also published guidance on risk assessment (Guidelines for Environmental Risk Assessment and Management). The guidance states that the designation of risk is based upon a consideration of both:

⁷ Guidance for the Safe Development of Housing on Land Affected by Contamination R&D66, NHBC, 2008.

⁸ Construction Industry Research and Information Association (CIRIA). Contaminated Land Risk Assessment. A Guide to Good Practice. CIRIA C552 2001.

⁹ Department of the Environment, Transport and the Regions, Environment Agency and Institute of Environmental Health. Guidelines for Environmental Risk Assessment and Management. HMSO July 2000.

- ▶ The magnitude of the potential consequence (severity) of risk occurring which takes into account both the potential severity of the hazard and the sensitivity of the receptor; and
- ▶ The likelihood of an event occurring (probability) which takes into account both the presence of the hazard and receptor and the integrity of the pathway.

The magnitude of consequence (severity) and likelihood (probability) is defined in the CIRIA guidance, together with examples. The two classifications are then compared (as shown on Table 1) to obtain an estimation of risk for each pollution linkage, ranging from “very high risk” to “very low risk”. A description of the risks and likely actions required is presented in Table 2. The benefit of estimating the risk in this way is that it can be revised after each investigation phase as the conceptual model and corresponding pollution linkages are refined.

Comparison of Consequence VS. Probability

		Consequence			
		Severe	Medium	Mild	Minor
Likelihood	High likelihood	Very high risk	High risk	Moderate risk	Moderate/ low risk
	Likely	High risk	Moderate risk	Moderate/ low risk	Low risk
	Low likelihood	Moderate risk	Moderate/ low risk	Low risk	Very low risk
	Unlikely	Moderate/ low risk	Low risk	Very low risk	Very low Risk

Description of the Classified Risks and Likely Action Required

Level of Risk	Description of Classification
Very High Risk	There is a high probability that severe harm could arise to a designated receptor from an identified hazard, or there is evidence that severe harm to a designated receptor is currently happening. If this risk is realised, it is likely to result in significant environmental and financial liability to current and/ or future site owners/ occupiers. Urgent investigation (if not already undertaken) and remediation is likely to be required.
High Risk	Harm is likely to arise to a designated receptor from an identified hazard. If risk is realised, it is likely to present a sizeable environmental and financial liability to current and/ or future site owners/ occupiers. Urgent investigation is required, and remediation work may be necessary in the short term and likely over the longer term.
Moderate Risk	It is possible that harm could arise to a designated receptor from an identified hazard. However, it is either relatively unlikely that any such harm would be severe, or if any harm were to occur it is more likely the harm would be relatively mild.

	Investigation is normally required to clarify the risk and determine the potential environmental liability. Some remedial works may be required over the longer term.
Low Risk	It is possible that harm could arise to a designated receptor from an identified hazard, but it is likely that this harm, if realised, would at worst normally be mild. Limited investigation may be recommended to clarify the risk, dependant on the sensitivity of the receptor and viewpoint of those of interest. Any remedial works are likely to be fairly limited.
Very Low Risk	There is a low possibility that harm could arise to a receptor. In the event of such harm being realised it is likely to be mild or minor.

The acceptability of risk will always depend upon the viewpoint of those of interest, whether it is an occupier of a site, a regulator or stakeholder. As a result, it could be that action will be required to deal with a level of risk even if it is classified as very low.

The Lion - Gravesend



ON SITE SOURCE: Shallow Soils Impacted by Current and Historical Site Use

JUSTIFICATION NOTES: A full list of summary notes which provide detail and context to the risk ratings assigned in the table below is given at the end of the table. If specific notes are particularly significant to a certain pollutant linkage, these are referenced in the final column of the table.

CONCEPTUAL SITE MODEL				RISK ASSESSMENT			KEY JUSTIFICATION NOTES
SOURCE - Potential contamination from current / historical site use(s): residential garden and Made Ground	POTENTIAL CONTAMINANTS - asbestos, metals, inorganics, PAH, TPH	PATHWAY	RECEPTOR	LIKELIHOOD OF OCCURRENCE	CONSEQUENCE (SEVERITY)	POTENTIAL RISK	
		Inhalation of contaminated dusts, gases and vapours, dermal contact and direct ingestion of contaminated soils	Staff, customers and visitors	Unlikely	Medium	Low	1 to 4
		Inhalation of contaminated dusts, gases and vapours, dermal contact and direct ingestion of contaminated soils	Ground / construction workers	Low Likelihood	Medium	Moderate/ low	1 to 5
		Vertical migration downwards via leaching and/or saturation of contaminated soils	Perched groundwater within Made Ground and/or Head Deposits	Low Likelihood	Mild	Low	3, 6 & 8
		Vertical migration downwards via leaching and vertical mixing with shallow groundwater	Deeper groundwater within the New Pit Chalk Formation (Principal aquifer)	Unlikely	Medium	Low	7 & 8
		Lateral migration of contaminants to down hydraulic gradient surface water (baseflow)	Surface water	Unlikely	Mild	Very Low	8 & 9
		Lateral migration of contaminants to down hydraulic gradient areas in groundwater and runoff	Adjacent land	Unlikely	Medium	Low	8 & 10
		Root uptake mechanisms	Flora	Low Likelihood	Mild	Low	1 & 3
		Chemical attack from aggressive ground conditions (pH and water soluble sulphate) and shallow contamination	Below ground structures	Unlikely	Mild	Very Low	1 & 3

JUSTIFICATION NOTES

NOTE ID	NOTES
1	It is understood that the site is proposed to be redeveloped to form an extended pub garden for The Lion pub , and to relocate the access point to the agricultural development beyond the east of the site (Court and Brookers Farm). The new entrance will be connected to a new HGV access way leading to the off-site farmyard, and a new pedestrian walkway to the pub garden. No buildings are proposed on site with external areas therefore comprising communal open space in the form of a pub garden, soft verges, and hardstanding access ways.
2	In areas of open ground , the following exposure pathways to humans are considered to be active: inhalation of contaminated dust and dermal contact and direct ingestion of contaminated soils. It is noted that these exposure pathways are only active in soft landscaped areas; permeant hardstanding breaks the potential pathways.
3	Periods of construction and demolition are not noted on site in historical mapping records, however given the previous development works along the boundaries of the site, waste demolition materials may have been spread across the subject site to form a layer of Made Ground . The Made Ground may contain contaminants such as asbestos and metals, however it is not anticipated to be of significant thickness. As such any Made Ground present is unlikely to represent a source of ground gas. Furthermore where the hardstanding was installed prior to 1990, the underlying sub-base may contain contaminants such as asbestos , which may be exposed during redevelopment works. The use of the land in the west of the central section as residential gardens could have also resulted in soil contamination.
4	Where the hardstanding is proposed to be removed from the northern portion of the site, to form the soft landscaped pub garden, the sub-base and any associated contamination (including potential asbestos) will be exposed, posing a risk to ground and construction staff working on the site. It is anticipated that any hazardous soils / materials will be appropriately managed and removed, so that no contamination or ACS (asbestos containing soil) is left within the pub garden area .
5	Risks to construction and ground workers can be mitigated through the preparation and implementation of a suitable health and safety plan including use of appropriate PPE and awareness of potential hazards through 'toolbox' talks.
6	Groundwater within the superficial Head Deposit is considered to have a Low (L1) sensitivity, which is described in the guidance as being a "permeable strata/minor aquifer near surface, but no apparent use and low vulnerability (may also be a significant aquifer but downgraded by long term/ permanent degradation of water quality). May provide pathway to surface watercourse at distance." This sensitivity classification has been assigned given the expected variable permeability and limited potential for groundwater storage and transmission within the Head Deposit.
7	Groundwater within the New Pit Chalk Formation is considered to have a High (H2) sensitivity , which is described in the guidance as being a "major or minor vulnerable aquifer with probable use nearby (either direct abstraction or baseflow to sensitive watercourses and springs). Likely to be within Outer or Source Catchment protection zones (Zones II or III). Most contaminant releases to the ground environment of concern." This sensitivity classification has been assigned given the designation of the site area as within a groundwater SPZ II (Outer Zone), the presence of groundwater abstractions approximately 900m away, and the expected permeability and potential for groundwater storage of this stratum as a Principal aquifer.
8	The superficial Head Deposits have variable permeability due to it containing varying compositions of clay, sand, silt and gravel. As such this stratum is not anticipated to be a viable groundwater aquifer capable of storing or transmitting significant quantities of groundwater. Any groundwater present will likely be held within discontinuous more granular lenses and be of limited value and low significance. The potential for significant mobilisation of contamination within this stratum is therefore low. As such, the potential for vertical mixing of shallow groundwater to deeper groundwater is reduced. This will also limit the potential for the lateral migration of site-borne contaminants to off-site areas (down hydraulic gradient) via baseflow.
9	Surface water is considered to have Low (L1) sensitivity, which is described in the guidance as being "within catchment of and over 250m from generally poor quality watercourse (GQA E or F) that is unlikely to improve by current or foreseeable surface water quality objectives or at distance (over 1000m) from a good quality watercourse with no interconnecting drains or baseflow from fissured strata." This sensitivity classification has been assigned given the absence of significant surface water features within 500m of the site.
10	The site is considered to have a moderate/low ecological sensitivity given the absence of any statutory designated ecological receptors either on-site or within proximity to the site, but also the presence of an Area of Outstanding Natural Beauty on site.

The Lion - Gravesend



OFF-SITE SOURCES

JUSTIFICATION NOTES: A full list of summary notes which provide detail and context to the risk ratings assigned in the table below is given at the end of the table. If specific notes are particularly significant to a certain pollutant linkage, these are referenced in the final column of the table.

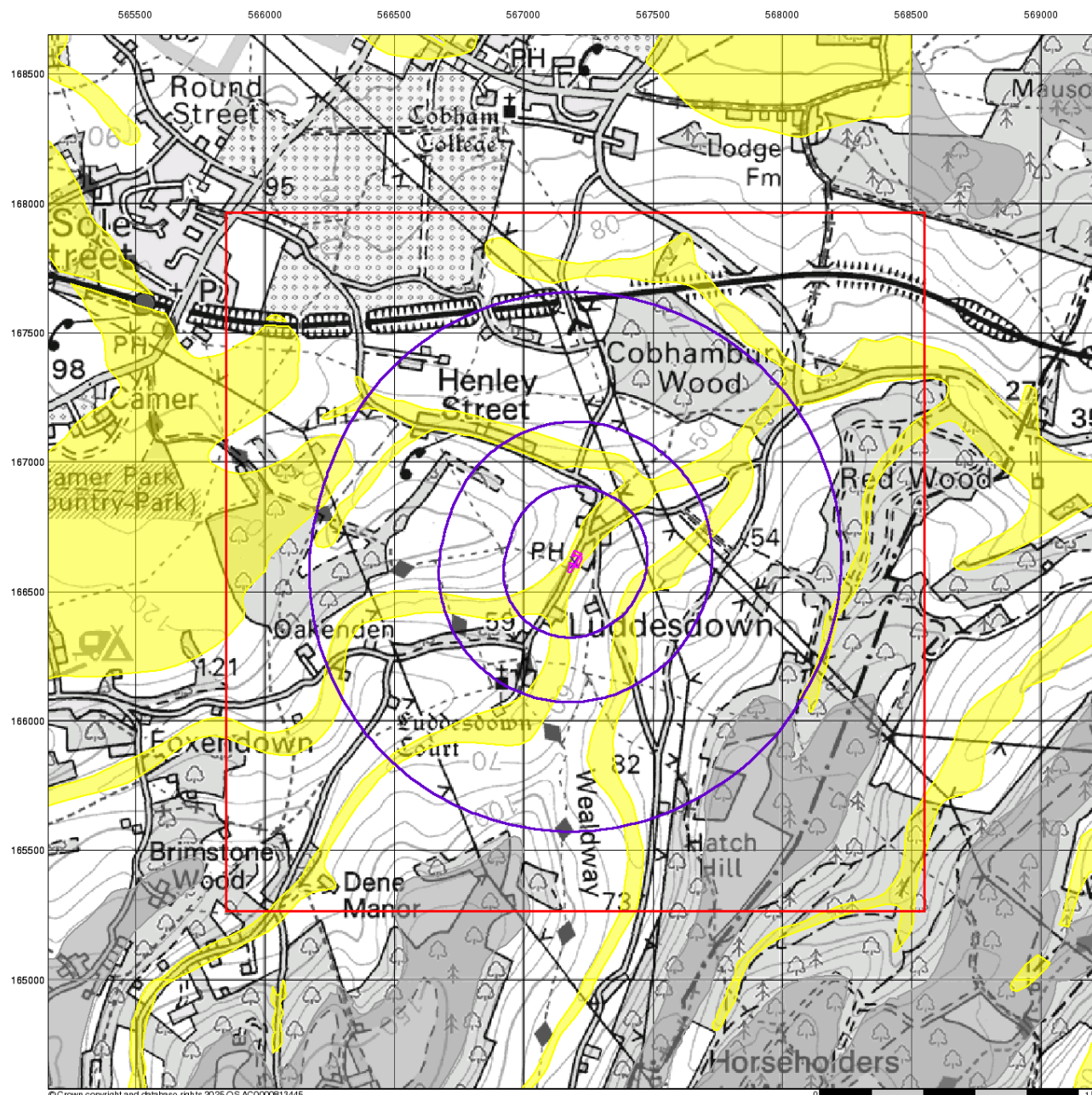
CONCEPTUAL SITE MODEL				RISK ASSESSMENT			KEY JUSTIFICATION NOTES
SOURCE	POTENTIAL CONTAMINANTS	PATHWAY	RECEPTOR	LIKELIHOOD OF OCCURRENCE	CONSEQUENCE (SEVERITY)	POTENTIAL RISK	
Off-site Commercial / Agricultural Development	TPH, PAHs, metals, vapours, solvents and inorganics	Inhalation of vapours from groundwater	Site occupants	Unlikely	Medium	Low	1 to 5
		Lateral migration of contaminated groundwater on to the subject site	On-site groundwater	Low Likelihood	Mild	Low	1 to 5

JUSTIFICATION NOTES

NOTE ID	NOTES
1	It is understood that the site is proposed to be redeveloped to form an extended pub garden for The Lion pub , and to relocate the access point to the agricultural development beyond the east of the site (Brookers Farm). The new entrance will be connected to a new HGV access way leading to the off-site farmyard, and a new pedestrian walkway to the pub garden. No buildings are proposed on site with external areas therefore comprising communal open space in the form of a pub garden, soft verges, and hardstanding access ways.
2	The only off-site source considered as viable is the ongoing commercial agricultural use of the land adjacent to the east of the site . It is anticipated that this area has been used for agriculture since at least the 1960s, and possibly earlier. It now comprises Court and Brookers Farm including an active winery (owned by Silverhand Estate), a yard area, warehouse and stores (associated with Vineyard Farms). During the site walkover, storage tanks, plant and crates of chemicals were observed across the Court and Brookers Farm site. Potential contaminants include TPH, PAHs, metals, vapours, solvents and inorganics.
3	Groundwater within the Head is considered to have a Low (L1) sensitivity , which is described in the guidance as being a "permeable strata/minor aquifer near surface, but no apparent use and low vulnerability (may also be a significant aquifer but downgraded by long term/ permanent degradation of water quality). May provide pathway to surface watercourse at distance." This sensitivity classification has been assigned given the expected low permeability and limited potential for groundwater storage and transmission within the Head Deposit.
4	Groundwater within the New Pit Chalk Formation is considered to have a High (H2) sensitivity , which is described in the guidance as being a "major or minor vulnerable aquifer with probable use nearby (either direct abstraction or baseflow to sensitive watercourses and springs). Likely to be within Outer or Source Catchment protection zones (Zones II or III). Most contaminant releases to the ground environment of concern." This sensitivity classification has been assigned given the designation of the site area as within a groundwater SPZ II (Outer Zone), the presence of groundwater abstractions approximately 900m away, and the expected permeability and potential for groundwater storage of this stratum as a Principal aquifer.
5	The superficial Head Deposits have variable permeability due to it containing varying compositions of clay, sand, silt and gravel. As such this stratum is not anticipated to be a viable groundwater aquifer capable of storing or transmitting significant quantities of groundwater. Any groundwater present will likely be held within discontinuous more granular lenses and be of limited value and low significance. The potential for significant mobilisation of contamination within this stratum is therefore low. As such, the potential for vertical mixing of shallow groundwater to deeper groundwater is reduced. This will also limit the potential for the lateral migration of site-borne contaminants to off-site areas (down hydraulic gradient) via baseflow. The migration of potential sources of off-site contamination and ground gases onto the site is also likely to be restricted noting the above.



APPENDIX A: Envirocheck Report



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Superficial Aquifer Designation

General

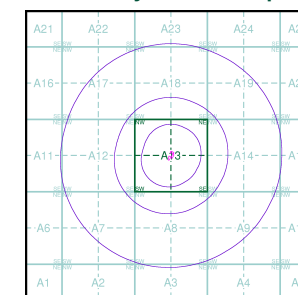
- ◊ Specified Site
- Specified Buffer(s)
- X Bearing Reference Point
- Slice
- B Map ID

Agency and Hydrological

Geological Classes

- Principal Aquifer
- Secondary A Aquifer
- Secondary B Aquifer
- Secondary Undifferentiated
- Unproductive Strata
- Unknown
- Unknown (Lakes and Landslip)

Site Sensitivity Context Map - Slice A



Order Details

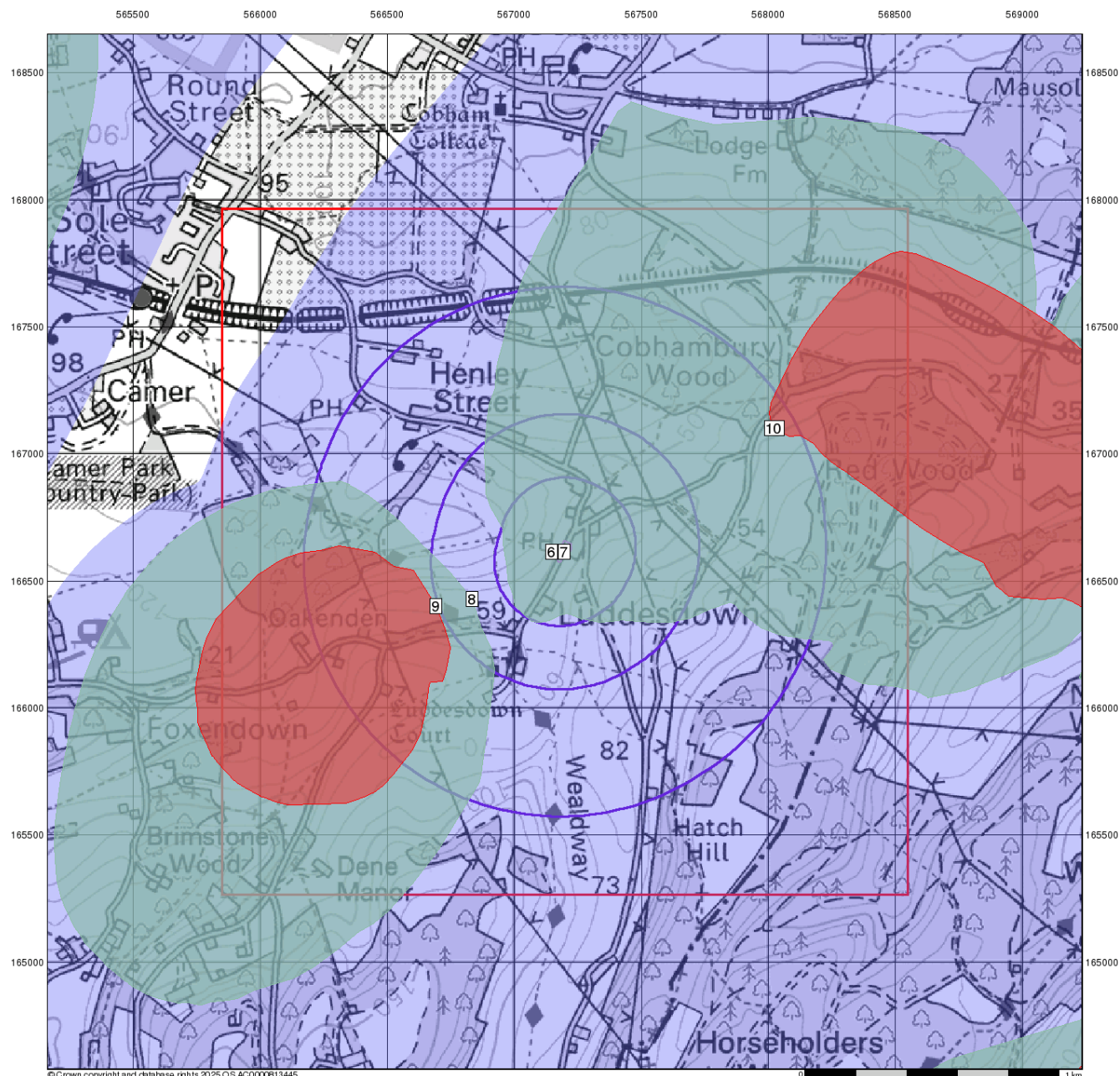
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 Customer Ref: 5318
 National Grid Reference: 567200, 166610
 Slice: A
 Site Area (Ha): 0.16
 Search Buffer (m): 1000

Site Details

The Lion, Luddesdown Road, Luddesdown, GRAVESEND, DA13 0XE

Landmark
INFORMATION GROUP

Tel: 0844 844 9952
 Fax: 0844 844 9951
 Web: www.envirocheck.co.uk



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Source Protection Zones

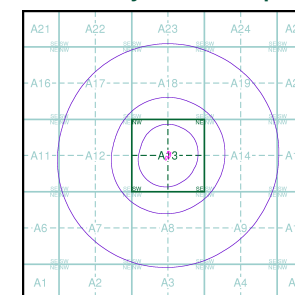
General

- ◇ Specified Site
- Specified Buffer(s)
- X Bearing Reference Point
- Slice
- 8 Map ID

Agency and Hydrological

- Inner zone (Zone 1)
- ▨ Inner zone - subsurface activity only (Zone 1c)
- Outer zone (Zone 2)
- ▨ Outer zone - subsurface activity only (Zone 2c)
- Total catchment (Zone 3)
- ▨ Total catchment - subsurface activity only (Zone 3c)
- Special interest (Zone 4)

Site Sensitivity Context Map - Slice A



Order Details

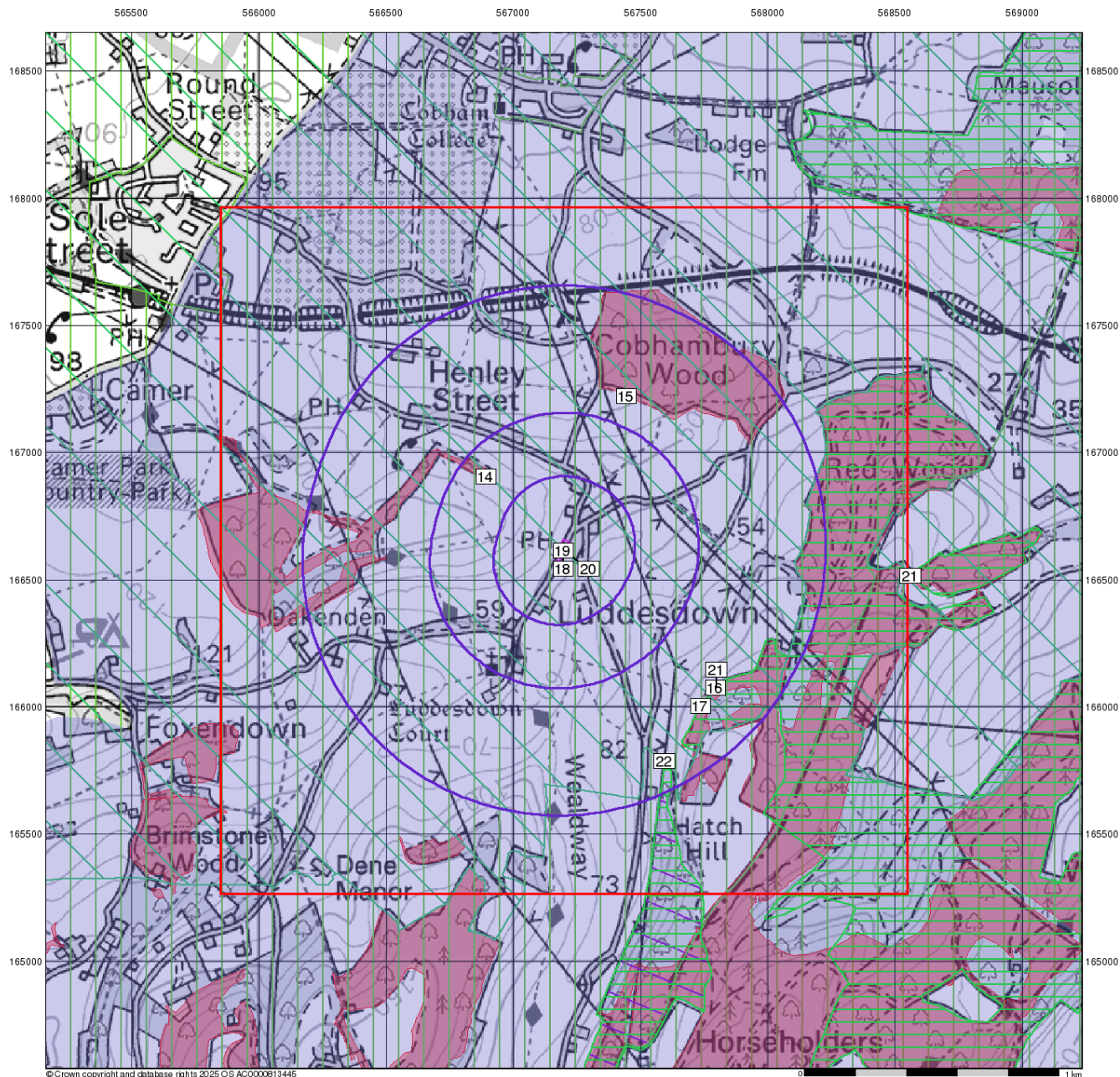
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Site Details

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Sensitive Land Uses

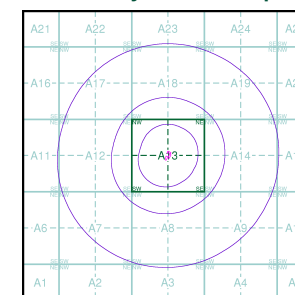
General

- Specified Site
- Specified Buffer(s)
- Bearing Reference Point
- Slice
- Map ID

Sensitive Land Uses

- Ancient Woodland
- Area of Adopted Green Belt
- Area of Unadopted Green Belt
- Area of Outstanding Natural Beauty
- Environmentally Sensitive Area
- Forest Park
- Local Nature Reserve
- Marine Nature Reserve
- National Nature Reserve
- National Park
- Nitrate Sensitive Area
- Nitrate Vulnerable Zone
- Ramsar Site
- Site of Special Scientific Interest
- Special Area of Conservation
- Special Protection Area
- World Heritage Sites

Site Sensitivity Context Map - Slice A



Order Details

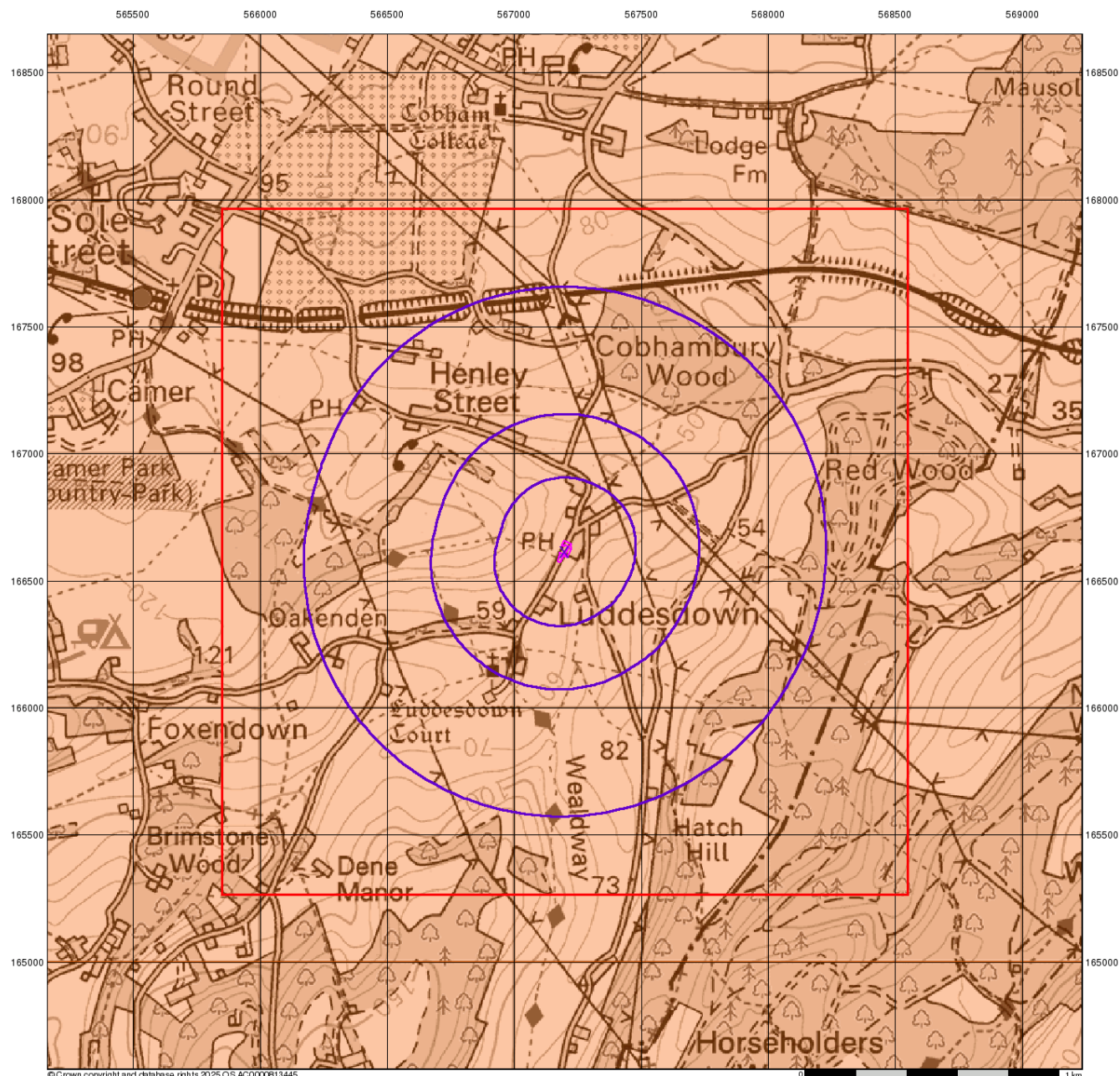
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 National Grid Reference: 567200, 166610
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 Site Area (Ha): 0.16
 Search Buffer (m): 1000

Site Details

The Lion, Luddesdown Road, Luddesdown, GRAVESEND, DA13 0XE

Landmark
INFORMATION GROUP

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BGS Flood GFS Data

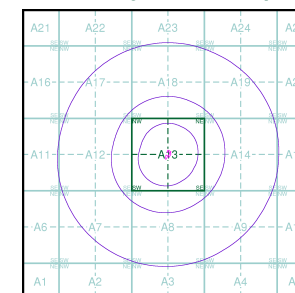
General

- Specified Site
- Specified Buffer(s)
- Bearing Reference Point
- Slice

Agency and Hydrological (Flood)

- Limited Potential for Groundwater Flooding to Occur
- Potential for Groundwater Flooding of Property Situated Below Ground Level
- Potential for Groundwater Flooding to Occur at Surface

Site Sensitivity Context Map - Slice A



Order Details

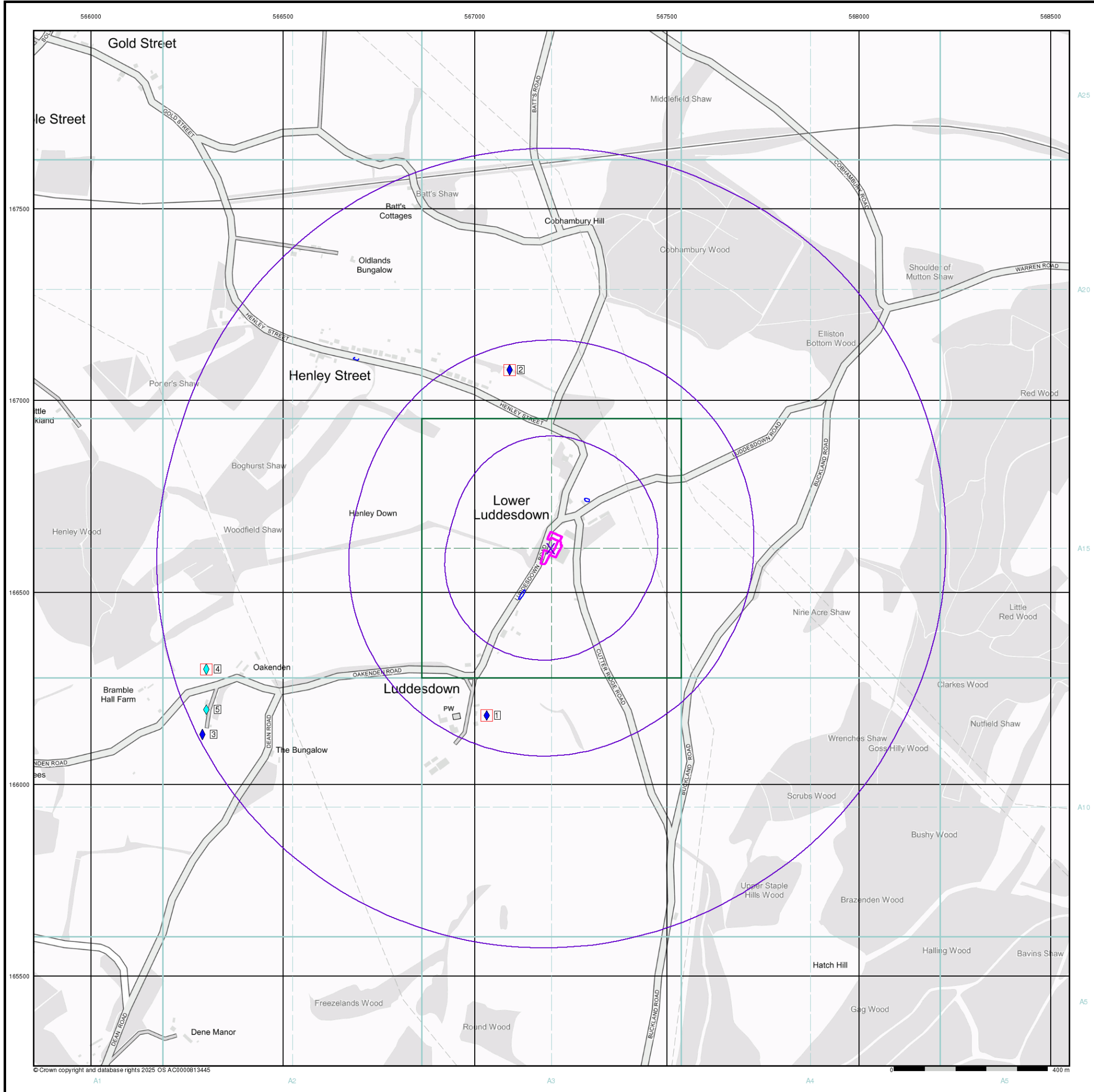
Order Number: 377683723_1_1
Customer Ref: 5318
National Grid Reference: 567200, 166610
Slice: A
Site Area (Ha): 0.16
Search Buffer (m): 1000

Site Details

The Lion, Luddesdown Road, Luddesdown, GRAVESEND, DA13 0XE

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General

- Specified Site
- Specified Buffer(s)
- Bearing Reference Point
- Map ID

Agency and Hydrological

- Contaminated Land Register Entry or Notice (Location)
- Contaminated Land Register Entry or Notice
- Discharge Consent
- Enforcement or Prohibition Notice
- Integrated Pollution Control
- Integrated Pollution Prevention Control
- Local Authority Integrated Pollution Prevention and Control
- Local Authority Pollution Prevention and Control
- Local Authority Pollution Prevention and Control Enforcement
- Pollution Incident to Controlled Waters
- Historical Prosecutions
- Prosecutions
- Registered Radioactive Substance
- River Network or Water Feature
- Substantiated Pollution Incident Register
- Water Abstraction
- Water Industry Act Referral

Waste

- BGS Recorded Landfill Site (Location)
- BGS Recorded Landfill Site
- EA Historic Landfill (Buffered Point)
- EA Historic Landfill (Polygon)
- Integrated Pollution Control Registered Waste Site
- Licensed Waste Management Facility (Landfill Boundary)
- Licensed Waste Management Facility (Location)
- Local Authority Recorded Landfill Site (Location)
- Local Authority Recorded Landfill Site
- Potentially Infilled Land (Non-water)
- Potentially Infilled Land (Non-water)
- Potentially Infilled Land (Non-water)
- Potentially Infilled Land (Water)
- Potentially Infilled Land (Water)
- Potentially Infilled Land (Water)
- Potentially Infilled Land (Water)
- Registered Landfill Site
- Registered Landfill Site (Point Buffered to 100m)
- Registered Landfill Site (Point Buffered to 250m)
- Registered Waste Transfer Site (Location)
- Registered Waste Transfer Site
- Registered Waste Treatment or Disposal Site (Location)
- Registered Waste Treatment or Disposal Site

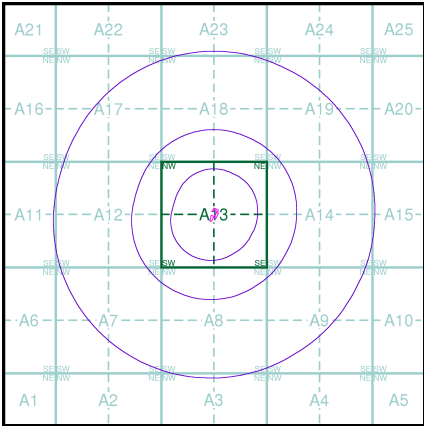
Hazardous Substances

- COMAH Site
- Explosive Site
- NIHHS Site
- Planning Hazardous Substance Consent
- Planning Hazardous Substance Enforcement

Geological

- BGS Recorded Mineral Site

Site Sensitivity Map - Slice A



Order Details

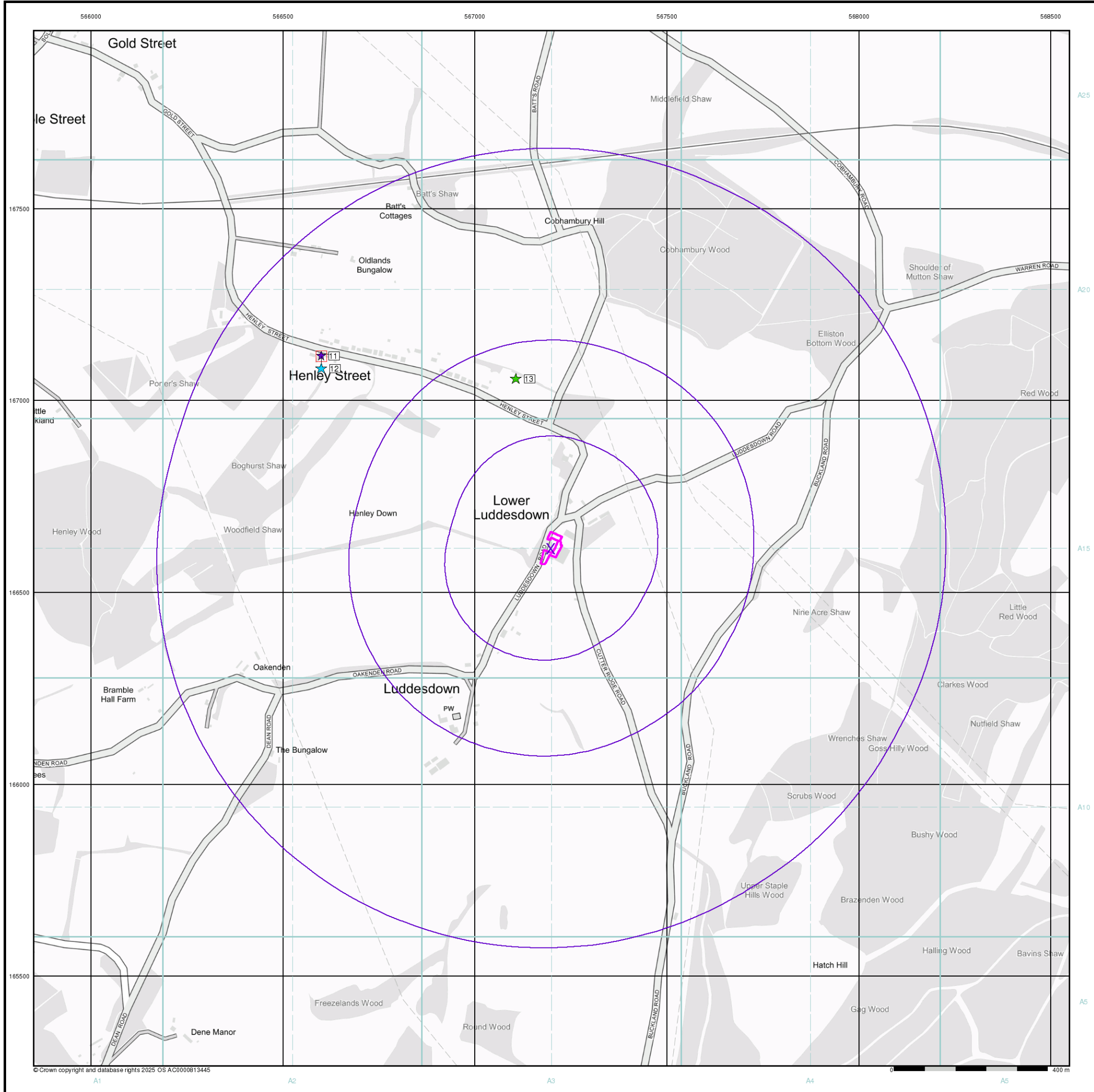
Order Number: 377683723_1_1
Customer Ref: 5318
National Grid Reference: 567200, 166610
Slice: A
Site Area (Ha): 0.16
Search Buffer (m): 1000

Site Details

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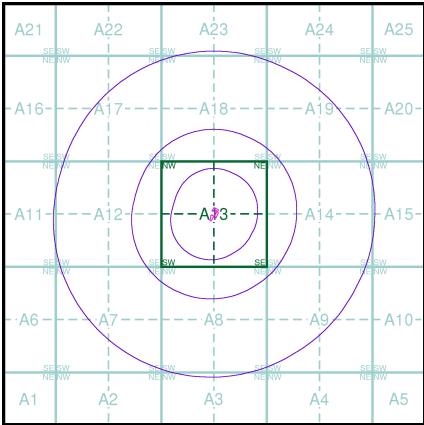
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Fax: 0844 844 9951
Web: www.envirocheck.co.uk



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Industrial Land Use Map

- General**
-  Specified Site
 -  Specified Buffer(s)
 -  Bearing Reference Point
 -  Slice
 -  Map ID
- Industrial Land Use**
-  Contemporary Trade Directory Entry
 -  Fuel Station Entry
 -  Points of Interest - Commercial Services
 -  Points of Interest - Education and Health
 -  Points of Interest - Manufacturing and Production
 -  Points of Interest - Public Infrastructure
 -  Points of Interest - Recreational and Environmental
 -  Underground Electrical Cables

Industrial Land Use Map - Slice A



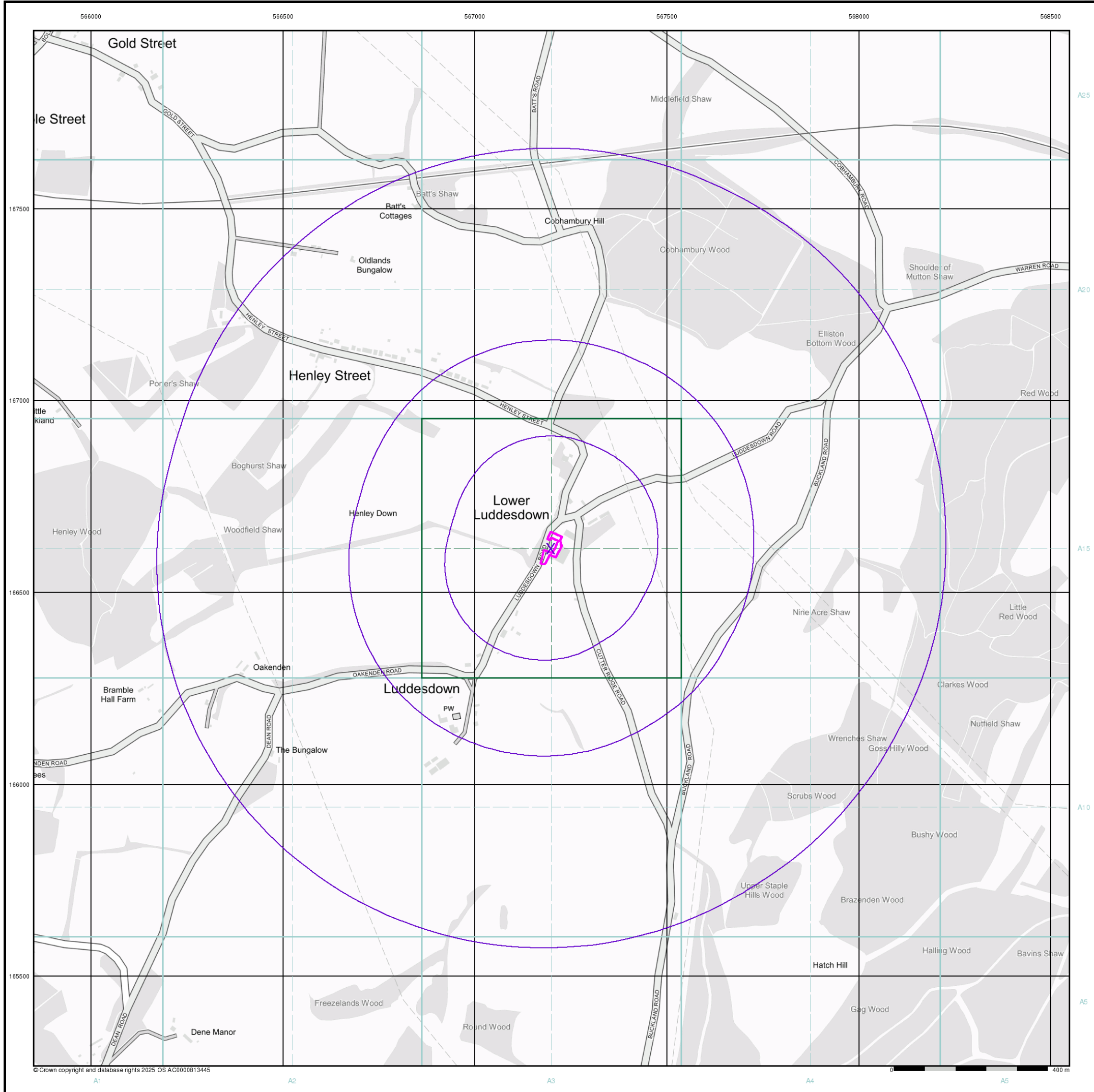
Order Details

Order Number: 377683723_1_1
Customer Ref: 5318
National Grid Reference: 567200, 166610
Slice: A
Site Area (Ha): 0.16
Search Buffer (m): 1000

Site Details
The Lion, Luddesdown Road, Luddesdown, GRAVESEND,
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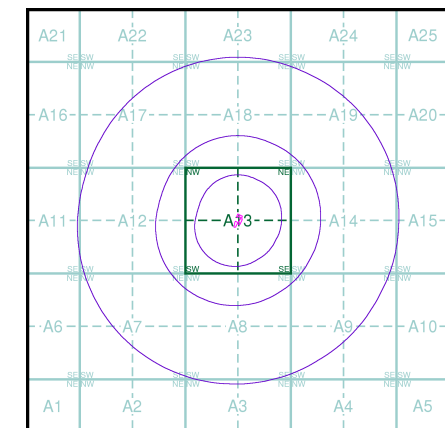
General

- Specified Site
- Specified Buffer(s)
- Bearing Reference Point

Agency and Hydrological (Flood)

- Extreme Flooding from Rivers or Sea without Defences (Zone 2)
- Flooding from Rivers or Sea without Defences (Zone 3)
- Area Benefiting from Flood Defence
- Flood Water Storage Areas
- Flood Defence

Flood Map - Slice A



Order Details

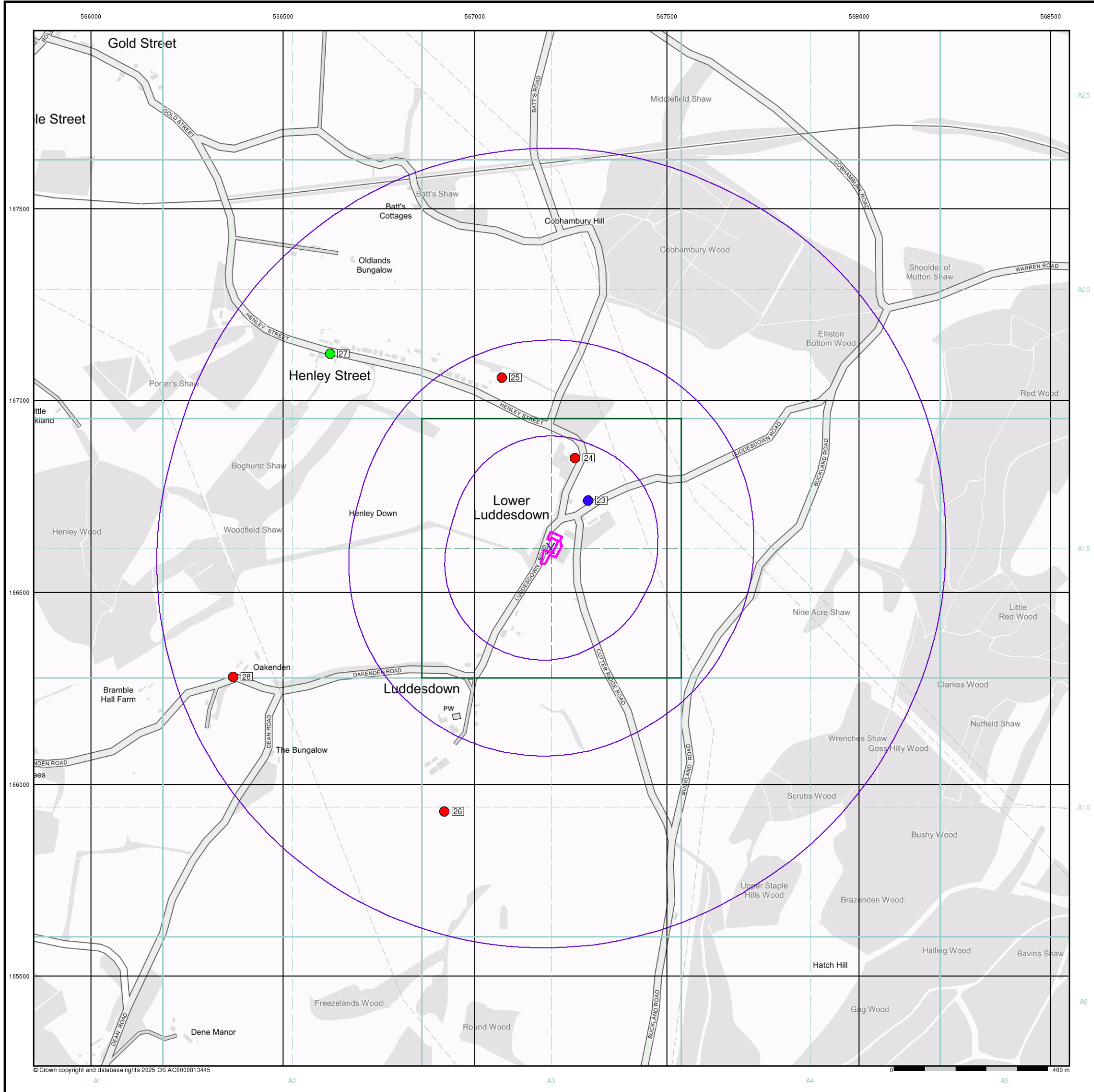
Order Number: 377683723_1_1
Customer Ref: 5318
National Grid Reference: 567200, 166610
Slice: A
Site Area (Ha): 0.16
Search Buffer (m): 1000

Site Details

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General

- Specified Site
- Specified Buffer(s)
- Bearing Reference Point
- Map ID
- Several of Type at Location

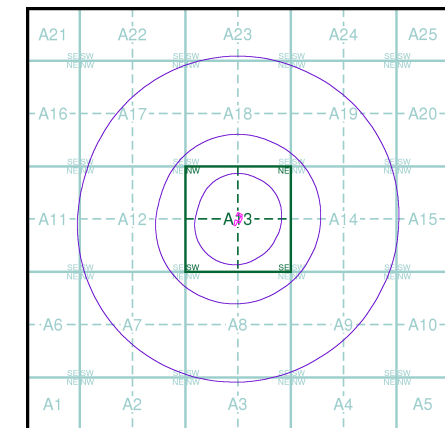
Agency and Hydrological (Boreholes)

- BGS Borehole Depth 0 - 10m
- BGS Borehole Depth 10 - 30m
- BGS Borehole Depth 30m +
- Confidential
- Other

For Borehole information please refer to the Borehole .csv file which accompanied this slice.

A copy of the BGS Borehole Ordering Form is available to download from the Support section of www.envirocheck.co.uk.

Borehole Map - Slice A



Order Details

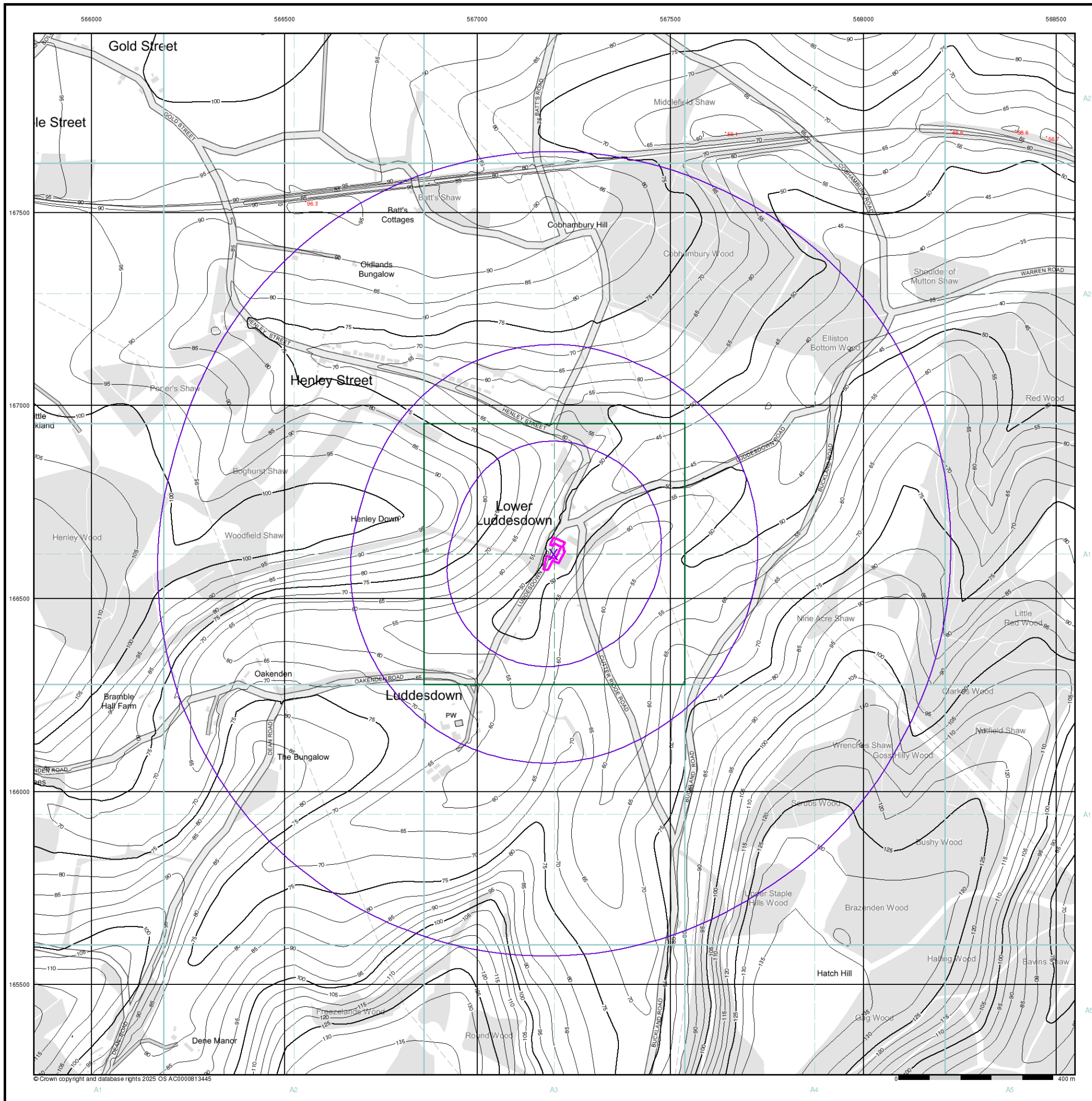
Order Number: 377683723_1_1
Customer Ref: 5318
National Grid Reference: 567200, 166610
Slice: A
Site Area (Ha): 0.16
Search Buffer (m): 1000

Site Details

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General

- Specified Site
- Specified Buffer(s)
- Bearing Reference Point

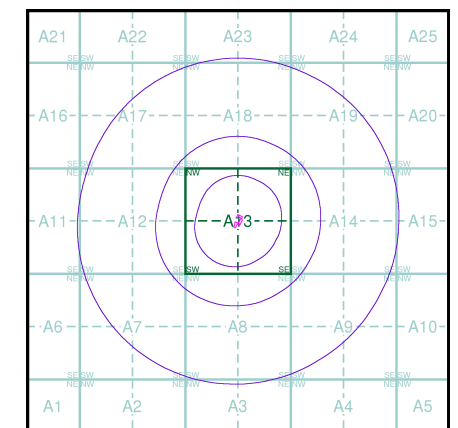
OS Water Network Data

- | | |
|--------------|-------------------------|
| Canal | Drain |
| Reservoir | Other |
| Foreshore | Lake |
| Marsh | Transfer |
| Tidal River | Lock Or Flight Of Locks |
| Inland River | Sea |

Contours (height in meters)

- Standard Contour 105 100 95
- Master Contour 105 100 95
- Spot Height 167.3
- MLW Mean Low Water
- MHV Mean High Water

OS Water Network Map - Slice A



Order Details

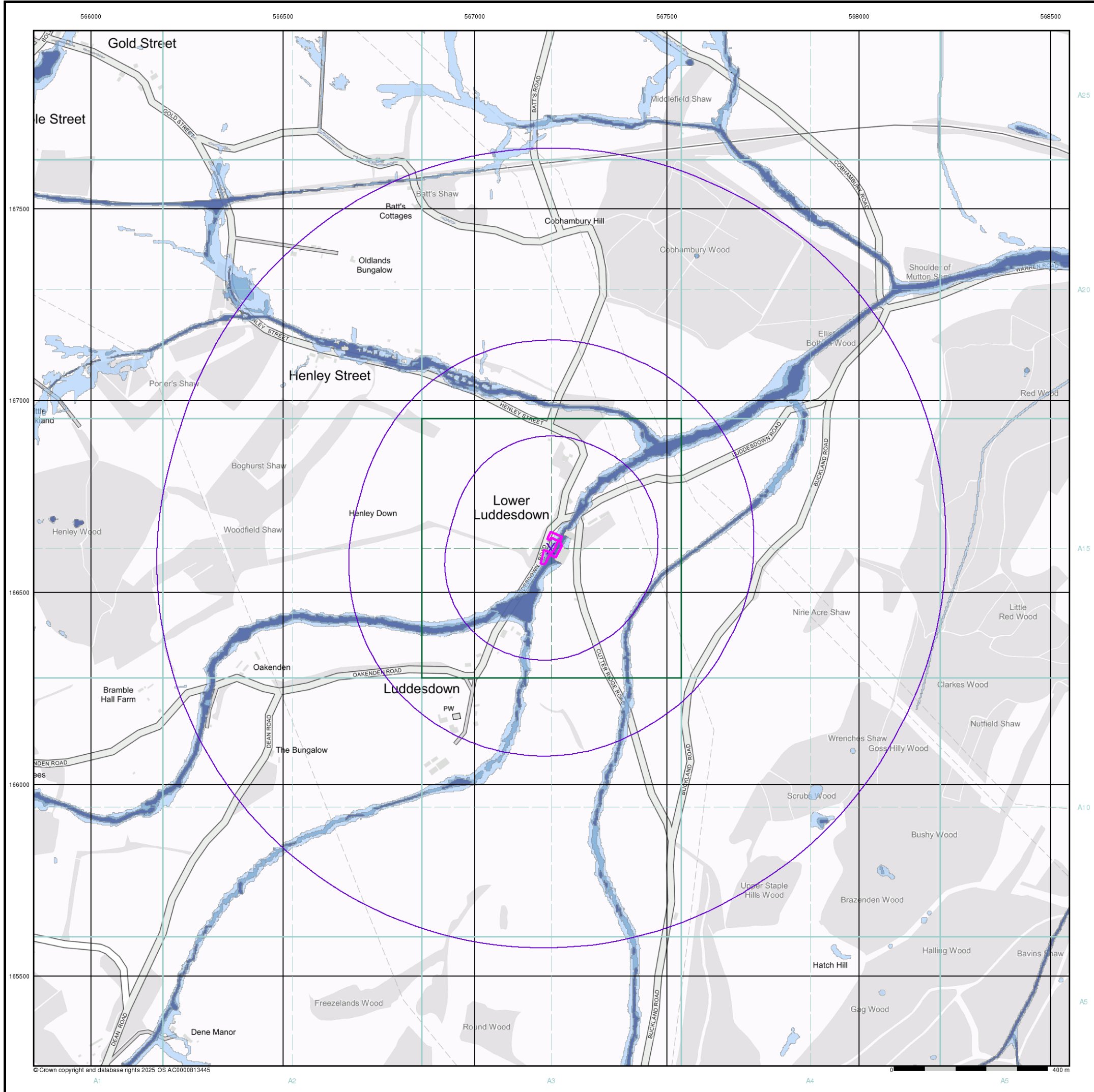
Order Number: 377683723_1_1
Customer Ref: 5318
National Grid Reference: 567200, 166610
Slice: A
Site Area (Ha): 0.16
Search Buffer (m): 1000

Site Details

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General

- Specified Site
- Specified Buffer(s)
- Bearing Reference Point

Risk of Flooding from Surface Water

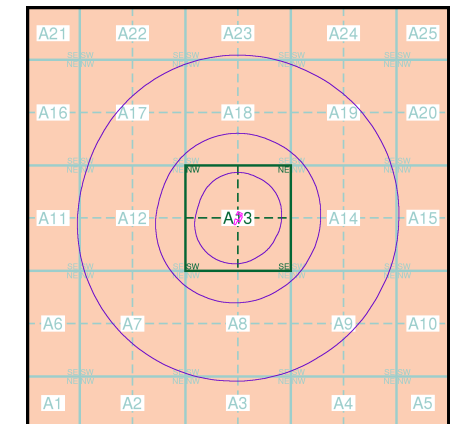
- High - 30 Year Return
- Medium - 100 Year Return
- Low - 1000 Year Return

Suitability

See the suitability map below

- National to county
- County to town
- Town to street
- Street to parcels of land
- Property

E/NRW Suitability Map - Slice A



Order Details

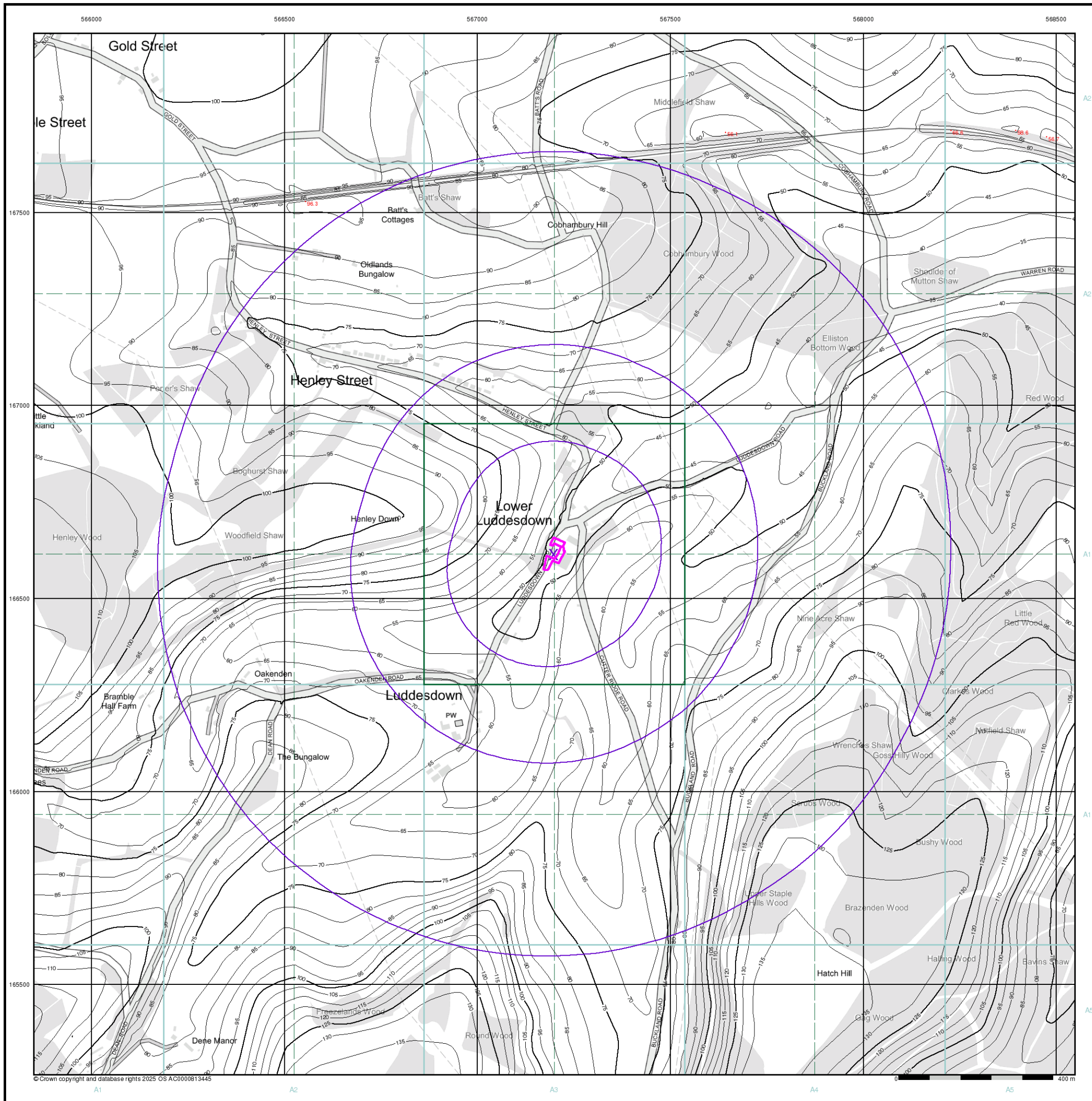
Order Number: 377683723_1_1
Customer Ref: 5318
National Grid Reference: 567200, 166610
Slice: A
Site Area (Ha): 0.16
Search Buffer (m): 1000

Site Details

The Lion, Luddesdown Road, Luddesdown, GRAVESEND,
DA13 0XE

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WFD Surface Waters Map

General

- Specified Site
- Specified Buffer(s)
- Bearing Reference Point
- Slice
- Map ID

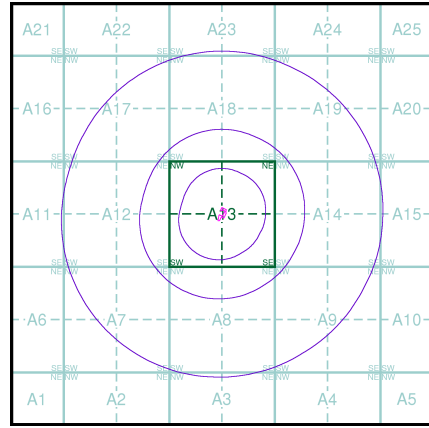
Water Framework Directive - Surface Water Quality

- High
- Good
- Moderate
- Poor
- Bad

Contours (height in meters)

- Standard Contour
- Master Contour
- Spot Height
- Mean Low Water
- Mean High Water

WFD Surface Waters Map - Slice A



Order Details

Order Number: 377683723_1_1
Customer Ref: 5318
National Grid Reference: 567200, 166610
Slice: A
Site Area (Ha): 0.16
Search Buffer (m): 1000

Site Details

The Lion, Luddesdown Road, Luddesdown, GRAVESEND, DA13 0XE



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Fax: 0844 844 9951
Web: www.envirocheck.co.uk

Envirocheck[®] Report:

Datasheet

Order Details:

Order Number:

377683723_1_1

Customer Reference:

5318

National Grid Reference:

567200, 166610

Slice:

A

Site Area (Ha):

0.16

Search Buffer (m):

1000

Site Details:

The Lion, Luddesdown Road
Luddesdown
GRAVESEND
DA13 0XE

Client Details:

Mr M Dean
Lustre Consulting Ltd
Units 42 & 43
The Joiners Shop
The Historic Dockyard
Chatham
Kent
ME4 4TZ

Report Section	Page Number
Summary	-
Agency & Hydrological	1
Waste	6
Hazardous Substances	-
Geological	7
Industrial Land Use	9
Sensitive Land Use	10
Data Currency	11
Data Suppliers	17
Useful Contacts	18

Introduction

The Environment Act 1995 has made site sensitivity a key issue, as the legislation pays as much attention to the pathways by which contamination could spread, and to the vulnerable targets of contamination, as it does the potential sources of contamination. For this reason, Landmark's Site Sensitivity maps and Datasheet(s) place great emphasis on statutory data provided by the Environment Agency/Natural Resources Wales and the Scottish Environment Protection Agency; it also incorporates data from Natural England (and the Scottish and Welsh equivalents) and Local Authorities; and highlights hydrogeological features required by environmental and geotechnical consultants. It does not include any information concerning past uses of land. The datasheet is produced by querying the Landmark database to a distance defined by the client from a site boundary provided by the client. In this datasheet the National Grid References (NGRs) are rounded to the nearest 10m in accordance with Landmark's agreements with a number of Data Suppliers.

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Radon Potential dataset Copyright Notice

Information supplied from a joint dataset compiled by The British Geological Survey and Public Health England. The probability result is only valid for properties above ground. All basement and cellar areas are considered to be at additional risk from high radon levels. If an underground room such as a cellar or basement makes up part of the living or working accommodation, the property should be tested regardless of Radon Affected Area status.

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Report Version v53.0

Data Type	Page Number	On Site	0 to 250m	251 to 500m	501 to 1000m (*up to 2000m)
Agency & Hydrological					
BGS Groundwater Flooding Susceptibility	pg 1	Yes			n/a
Contaminated Land Register Entries and Notices					
Discharge Consents	pg 1			6	1
Prosecutions					
Enforcement and Prohibition Notices					
Integrated Pollution Controls					
Integrated Pollution Prevention And Control					
Local Authority Integrated Pollution Prevention And Control					
Local Authority Pollution Prevention and Controls					
Local Authority Pollution Prevention and Control Enforcements					
Nearest Surface Water Feature	pg 2		Yes		
Pollution Incidents to Controlled Waters					
Historical Prosecutions					
Registered Radioactive Substances					
Substantiated Pollution Incident Register					
Water Abstractions	pg 2				5 (*3)
Water Industry Act Referrals					
Groundwater Vulnerability Map	pg 4	Yes	n/a	n/a	n/a
Groundwater Vulnerability - Soluble Rock Risk	pg 4	1	n/a	n/a	n/a
Groundwater Vulnerability - Local Information			n/a	n/a	n/a
Bedrock Aquifer Designations	pg 4	Yes	n/a	n/a	n/a
Superficial Aquifer Designations	pg 4	Yes	n/a	n/a	n/a
Source Protection Zones	pg 5	2		1	2
Extreme Flooding from Rivers or Sea without Defences				n/a	n/a
Flooding from Rivers or Sea without Defences				n/a	n/a
Areas Benefiting from Flood Defences				n/a	n/a
Flood Water Storage Areas				n/a	n/a
Flood Defences				n/a	n/a
OS Water Network Lines					
Water Framework Directive - Catchment	pg 5	Yes			Yes
Water Framework Directive - Groundwater	pg 5	Yes			
Water Framework Directive - Surface Waters					

Data Type	Page Number	On Site	0 to 250m	251 to 500m	501 to 1000m (*up to 2000m)
Waste					
BGS Recorded Landfill Sites					
Historical Landfill Sites					
Integrated Pollution Control Registered Waste Sites					
Licensed Waste Management Facilities (Landfill Boundaries)					
Licensed Waste Management Facilities (Locations)					
Local Authority Landfill Coverage	pg 6	2	n/a	n/a	n/a
Local Authority Recorded Landfill Sites					
Potentially Infilled Land (Non-Water)					
Potentially Infilled Land (Water)					
Registered Landfill Sites					
Registered Waste Transfer Sites					
Registered Waste Treatment or Disposal Sites					
Hazardous Substances					
Control of Major Accident Hazards Sites (COMAH)					
Explosive Sites					
Notification of Installations Handling Hazardous Substances (NIHHS)					
Planning Hazardous Substance Consents					
Planning Hazardous Substance Enforcements					

Data Type	Page Number	On Site	0 to 250m	251 to 500m	501 to 1000m (*up to 2000m)
Geological					
BGS 1:625,000 Solid Geology	pg 7	Yes	n/a	n/a	n/a
BGS Estimated Soil Chemistry	pg 7	Yes		Yes	
BGS Recorded Mineral Sites					
BGS Urban Soil Chemistry					
BGS Urban Soil Chemistry Averages					
CBSCB Compensation District			n/a	n/a	n/a
Coal Mining Affected Areas			n/a	n/a	n/a
Mining Instability			n/a	n/a	n/a
Man-Made Mining Cavities					
Natural Cavities					
Non Coal Mining Areas of Great Britain	pg 7	Yes		n/a	n/a
Potential for Collapsible Ground Stability Hazards	pg 7	Yes		n/a	n/a
Potential for Compressible Ground Stability Hazards				n/a	n/a
Potential for Ground Dissolution Stability Hazards	pg 7	Yes		n/a	n/a
Potential for Landslide Ground Stability Hazards	pg 7	Yes	Yes	n/a	n/a
Potential for Running Sand Ground Stability Hazards	pg 8	Yes		n/a	n/a
Potential for Shrinking or Swelling Clay Ground Stability Hazards	pg 8	Yes		n/a	n/a
Radon Potential - Radon Affected Areas	pg 8	Yes	n/a	n/a	n/a
Radon Potential - Radon Protection Measures			n/a	n/a	n/a
Industrial Land Use					
Contemporary Trade Directory Entries	pg 9				3
Fuel Station Entries					
Points of Interest - Commercial Services	pg 9				1
Points of Interest - Education and Health					
Points of Interest - Manufacturing and Production					
Points of Interest - Public Infrastructure					
Points of Interest - Recreational and Environmental	pg 9			1	
Underground Electrical Cables					

Data Type	Page Number	On Site	0 to 250m	251 to 500m	501 to 1000m (*up to 2000m)
Sensitive Land Use					
Ancient Woodland	pg 10			1	3
Areas of Adopted Green Belt	pg 10	1			
Areas of Unadopted Green Belt					
Areas of Outstanding Natural Beauty	pg 10	1			
Environmentally Sensitive Areas					
Forest Parks					
Local Nature Reserves					
Marine Nature Reserves					
National Nature Reserves					
National Parks					
Nitrate Sensitive Areas					
Nitrate Vulnerable Zones	pg 10	1			
Ramsar Sites					
Sites of Special Scientific Interest	pg 10				1
Special Areas of Conservation	pg 10				1
Special Protection Areas					
World Heritage Sites					

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A13SW (N)	0	1	567197 166615
1	Discharge Consents Operator: Luddesdown Organic Farms Ltd. Property Type: DOMESTIC PROPERTY (MULTIPLE) (INCL FARM HOUSES) Location: Meadow House & Court Lodge, Farmhouse, Luddesdown Kent Authority: Environment Agency, Southern Region Catchment Area: Not Supplied Reference: P00615 Permit Version: 2 Effective Date: 21st December 2012 Issued Date: 21st December 2012 Revocation Date: Not Supplied Discharge Type: Sewage Discharges - Final/Treated Effluent - Not Water Company Discharge Environment: Land/Soakaway Receiving Water: Into Land Status: Varied under EPR 2010 Positional Accuracy: Located by supplier to within 10m	A8NW (S)	421	2	567030 166180
1	Discharge Consents Operator: Luddesdown Organic Farms Ltd. Property Type: DOMESTIC PROPERTY (MULTIPLE) (INCL FARM HOUSES) Location: Meadow House And Court Lodge, Farmhouse, LUDDESDOWN , Kent Authority: Environment Agency, Southern Region Catchment Area: Not Given Reference: P00615 Permit Version: 1 Effective Date: 29th August 1986 Issued Date: 29th August 1986 Revocation Date: 20th December 2012 Discharge Type: Non Water Company (Private) Sewage Discharge Environment: Land/Soakaway Receiving Water: Into Land Status: Pre National Rivers Authority Legislation where issue date < 01/09/1989 Positional Accuracy: Located by supplier to within 100m	A8NW (S)	421	2	567030 166180
2	Discharge Consents Operator: Southern Water Services Limited Property Type: WWTW/SEWAGE TREATMENT WORKS (WATER COMPANY) Location: Luddesdown Wastewater Trmnt Works, Henley Street, Luddesdown, Kent, Da13 0xd Authority: Environment Agency, Southern Region Catchment Area: Not Supplied Reference: Npswqd010446 Permit Version: 3 Effective Date: 15th February 2017 Issued Date: 15th February 2017 Revocation Date: Not Supplied Discharge Type: Sewage Discharges - Final/Treated Effluent - Water Company Discharge Environment: Land/Soakaway Receiving Water: Groundwaters Via Infil System Status: Varied under EPR 2010 Positional Accuracy: Located by supplier to within 10m	A18SW (N)	432	2	567070 167070
2	Discharge Consents Operator: Southern Water Services Limited Property Type: WWTW/SEWAGE TREATMENT WORKS (WATER COMPANY) Location: Luddesdown Wastewater Trmnt Works, Henley Street, Luddesdown, Kent, Da13 0xd Authority: Environment Agency, Southern Region Catchment Area: Not Supplied Reference: Npswqd010446 Permit Version: 1 Effective Date: 31st March 2010 Issued Date: 31st March 2010 Revocation Date: 21st December 2012 Discharge Type: Sewage Discharges - Final/Treated Effluent - Water Company Discharge Environment: Land/Soakaway Receiving Water: Groundwaters Via Infil System Status: New Consent (Water Resources Act 1991, Section 88 & Schedule 10 as amended by Environment Act 1995) Positional Accuracy: Located by supplier to within 10m	A18SW (N)	437	2	567090 167080

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
2	Discharge Consents Operator: Southern Water Services Limited Property Type: WWTW/SEWAGE TREATMENT WORKS (WATER COMPANY) Location: Luddesdown Wastewater Trmnt Works, Henley Street, Luddesdown, Kent, Da13 0xd Authority: Environment Agency, Southern Region Catchment Area: Not Supplied Reference: Npswqd010446 Permit Version: 2 Effective Date: 22nd December 2012 Issued Date: 31st March 2010 Revocation Date: 14th February 2017 Discharge Type: Sewage Discharges - Final/Treated Effluent - Water Company Discharge: Land/Soakaway Environment: Receiving Water: Groundwaters Via Infiltration System Status: New Consent (Water Resources Act 1991, Section 88 & Schedule 10 as amended by Environment Act 1995) Positional Accuracy: Located by supplier to within 10m	A18SW (N)	437	2	567090 167080
2	Discharge Consents Operator: Southern Water Services Limited Property Type: WWTW/SEWAGE TREATMENT WORKS (WATER COMPANY) Location: Luddesdown Wastewater Trmnt Works, Henley Street, Luddesdown, Kent, Da13 0xd Authority: Environment Agency, Southern Region Catchment Area: Not Supplied Reference: App/So/254k Permit Version: 1 Effective Date: 1st April 1999 Issued Date: 1st April 1999 Revocation Date: 30th March 2010 Discharge Type: Sewage Discharges - Final/Treated Effluent - Water Company Discharge: Land/Soakaway Environment: Receiving Water: Into Land Status: Temporary Consents (Water Act 1989, Section 113) Positional Accuracy: Located by supplier to within 10m	A18SW (N)	437	2	567090 167080
3	Discharge Consents Operator: Southern Water Services Limited Property Type: WTW/WATER COLLECTION/TREATMENT/SUPPLY Location: Luddesdown Water Supply Works, Oakenden Road, Luddesdown, Gravesend, Kent, Da13 0xq Authority: Environment Agency, Southern Region Catchment Area: Not Supplied Reference: A00791 Permit Version: 3 Effective Date: 13th February 2017 Issued Date: 13th February 2017 Revocation Date: 30th March 2020 Discharge Type: Trade Discharges - Process Effluent - Water Company (Wtw) Discharge: Land/Soakaway Environment: Receiving Water: Gw Via Settling Lagoon Status: Surrendered under EPR 2010 Positional Accuracy: Located by supplier to within 10m	A7NW (SW)	988	2	566290 166130
	Nearest Surface Water Feature	A13SW (SW)	82	-	567130 166506
4	Water Abstractions Operator: Southern Water Services Ltd Licence Number: 1/0511/E/G Permit Version: Not Supplied Location: Luddesdown Pumping Station, LUDDESDOWN Authority: Environment Agency, Southern Region Abstraction: Flow Augment Abstraction Type: Not Supplied Source: Pond or Lake Daily Rate (m3): 6500 Yearly Rate (m3): 2379000 Details: Additional Purpose: Public Water Supply Authorised Start: Not Supplied Authorised End: Not Supplied Permit Start Date: Not Supplied Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 100m	A12SW (W)	911	2	566305 166295

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
4	Water Abstractions Operator: Southern Water Services Ltd Licence Number: 01/026 Permit Version: Not Supplied Location: Luddesdown Ps Authority: Environment Agency, Southern Region Abstraction: Public Water Supply Abstraction Type: Not Supplied Source: Groundwater Daily Rate (m3): 6500 Yearly Rate (m3): 2379000 Details: H5 Chalk; Licence Status: Revoked; Lapsed Or Cancelled Authorised Start: Not Supplied Authorised End: Not Supplied Permit Start Date: Not Supplied Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 100m	A12SW (W)	915	2	566300 166300
4	Water Abstractions Operator: Southern Water Services Ltd Licence Number: 9/40/01/0511/G Permit Version: 100 Location: Chalk Boreholes, Wells And Adits At Luddesdown Ps Authority: Environment Agency, Southern Region Abstraction: Public Water Supply: Potable Water Supply - Direct Abstraction Type: Water may be abstracted from any point within an area Source: Groundwater Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: N/A Authorised Start: 01 January Authorised End: 31 December Permit Start Date: 27th November 2006 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A7NW (W)	931	2	566300 166250
4	Water Abstractions Operator: Southern Water Services Ltd Licence Number: 9/40/01/0511/G Permit Version: 100 Location: Lower Greensand Boreholes, Wells And Adits At Luddesdown Ps Authority: Environment Agency, Southern Region Abstraction: Public Water Supply: Potable Water Supply - Direct Abstraction Type: Water may be abstracted from any point within an area Source: Groundwater Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: N/A Authorised Start: 01 January Authorised End: 31 December Permit Start Date: 27th November 2006 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A7NW (W)	931	2	566300 166250
5	Water Abstractions Operator: Southern Water Services Ltd Licence Number: 1/0511/C/G Permit Version: Not Supplied Location: Luddesdown Pumping Station, LUDDESDOWN Authority: Environment Agency, Southern Region Abstraction: Public Water Supply Abstraction Type: Not Supplied Source: Pond or Lake Daily Rate (m3): 2500 Yearly Rate (m3): 915000 Details: Additional Purpose: Public Water Supply Authorised Start: Not Supplied Authorised End: Not Supplied Permit Start Date: Not Supplied Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 100m	A7NW (SW)	952	2	566300 166195

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	Water Abstractions Operator: Southern Water Services Ltd Licence Number: 9/40/01/0511/G Permit Version: 100 Location: Boreholes, Wells And Adits At Cuxton Ps Authority: Environment Agency, Southern Region Abstraction: Public Water Supply: Potable Water Supply - Direct Abstraction Type: Water may be abstracted from any point within an area Source: Groundwater Daily Rate (m3): 21000 Yearly Rate (m3): 7686000 Details: N/A Authorised Start: 01 January Authorised End: 31 December Permit Start Date: 27th November 2006 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A20NE (NE)	1558	2	568620 167340
	Water Abstractions Operator: Southern Water Services Ltd Licence Number: 1/0511/I/G Permit Version: Not Supplied Location: Cuxton Pumping Station, & Dean Farm, CUXTON Authority: Environment Agency, Southern Region Abstraction: Public Water Supply Abstraction Type: Not Supplied Source: Pond or Lake Daily Rate (m3): 21000 Yearly Rate (m3): 7686000 Details: Additional Purpose: Public Water Supply Authorised Start: Not Supplied Authorised End: Not Supplied Permit Start Date: Not Supplied Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 100m	(E)	1791	2	569000 166895
	Water Abstractions Operator: Adrian Scripps Limited Licence Number: So/040/0001/046 Permit Version: 1 Location: Borehole At Parsonage Farm Authority: Environment Agency, Southern Region Abstraction: Trickle Irrigation Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Not Supplied Authorised Start: 01 April Authorised End: 31 October Permit Start Date: 7th December 2021 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	(N)	1901	2	566625 168470
	Groundwater Vulnerability Map Combined Classification: Secondary Superficial Aquifer - High Vulnerability Combined Vulnerability: High Combined Aquifer: Productive Bedrock Aquifer, Productive Superficial Aquifer Pollutant Speed: High Bedrock Flow: Well Connected Fractures Dilution: <300 mm/year Baseflow Index: >70% Superficial Patchiness: <90% Superficial Thickness: <3m Superficial Recharge: No Data	A13SW (N)	0	2	567197 166615
	Groundwater Vulnerability - Soluble Rock Risk Classification: Very Significant Risk - Moderate Possibility	A13SW (N)	0	2	567197 166615
	Bedrock Aquifer Designations Aquifer Designation: Principal Aquifer	A13SW (N)	0	3	567197 166615
	Superficial Aquifer Designations Aquifer Designation: Secondary Aquifer - Undifferentiated	A13SW (N)	0	3	567197 166615

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
6	Source Protection Zones Name: Not Supplied Source: Environment Agency, Head Office Reference: Not Supplied Type: Zone III (Total Catchment): The total area needed to support the discharge from the protected groundwater source.	A13SW (N)	0	2	567197 166615
7	Source Protection Zones Name: Not Supplied Source: Environment Agency, Head Office Reference: Not Supplied Type: Zone II (Outer Protection Zone): Either 25% of the source area or a 400 day travel time whichever is greater.	A13SW (N)	0	2	567197 166615
8	Source Protection Zones Name: Not Supplied Source: Environment Agency, Head Office Reference: Not Supplied Type: Zone II (Outer Protection Zone): Either 25% of the source area or a 400 day travel time whichever is greater.	A12SE (SW)	370	2	566834 166427
9	Source Protection Zones Name: Not Supplied Source: Environment Agency, Head Office Reference: Not Supplied Type: Zone I (Inner Protection Zone): Travel time of 50 days or less to the groundwater source.	A12SE (SW)	511	2	566693 166399
10	Source Protection Zones Name: Not Supplied Source: Environment Agency, Head Office Reference: Not Supplied Type: Zone I (Inner Protection Zone): Travel time of 50 days or less to the groundwater source.	A19SE (NE)	920	2	568025 167101
	Extreme Flooding from Rivers or Sea without Defences None				
	Flooding from Rivers or Sea without Defences None				
	Areas Benefiting from Flood Defences None				
	Flood Water Storage Areas None				
	Flood Defences None				
	OS Water Network Lines None				
	Water Framework Directive - Catchment Class Code: Coastal Catchment WaterBody Name: Not Supplied WaterBody ID: 130 Operational: Lower Medway Catchment: Medway Management: Medway Catchment: Medway Catchment Name: Not Supplied	A13SW (N)	0	2	567197 166615
	Water Framework Directive - Catchment Class Code: Coastal Catchment WaterBody Name: Not Supplied WaterBody ID: 132 Operational: Lower Medway Catchment: Medway Management: Medway Catchment: Medway Catchment Name: Not Supplied	A9NW (SE)	807	2	567851 166102
	Water Framework Directive - Groundwater Waterbody Name: North Kent Medway Chalk Waterbody ID: GB40601G500300 URL Address: https://environment.data.gov.uk/catchment-planning/WaterBody/GB40601G500300 Overall Rating: Poor Chemical Rating: Poor Quantitative Measure: Poor Year: 2019	A13SW (N)	0	2	567197 166615

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	Local Authority Landfill Coverage Name: Gravesham Borough Council - Has no landfill data to supply		0	4	567197 166615
	Local Authority Landfill Coverage Name: Kent County Council - Had landfill data but passed it to the relevant environment agency		0	5	567197 166615

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	BGS 1:625,000 Solid Geology Description: White Chalk Subgroup	A13SW (N)	0	1	567197 166615
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Rural Soil and Sediment Arsenic Concentration: <15 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 60 - 90 mg/kg Lead Concentration: <100 mg/kg Nickel Concentration: 15 - 30 mg/kg	A13SW (N)	0	1	567197 166615
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Rural Soil and Sediment Arsenic Concentration: 15 - 25 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 60 - 90 mg/kg Lead Concentration: <100 mg/kg Nickel Concentration: 15 - 30 mg/kg	A18SW (N)	343	1	567197 167000
	BGS Measured Urban Soil Chemistry No data available				
	BGS Urban Soil Chemistry Averages No data available				
	Coal Mining Affected Areas In an area that might not be affected by coal mining				
	Non Coal Mining Areas of Great Britain Risk: Rare Source: British Geological Survey, National Geoscience Information Service	A13SW (N)	0	1	567197 166615
	Potential for Collapsible Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13SW (N)	0	1	567197 166615
	Potential for Compressible Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13SW (N)	0	1	567197 166615
	Potential for Ground Dissolution Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13SW (N)	0	1	567197 166615
	Potential for Ground Dissolution Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13NW (NW)	14	1	567171 166630
	Potential for Ground Dissolution Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13SE (E)	17	1	567240 166612
	Potential for Ground Dissolution Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13SE (SE)	173	1	567366 166518
	Potential for Landslide Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13SW (N)	0	1	567197 166615
	Potential for Landslide Ground Stability Hazards Hazard Potential: Low Source: British Geological Survey, National Geoscience Information Service	A13NW (NW)	0	1	567186 166620
	Potential for Landslide Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13SE (SE)	6	1	567221 166599
	Potential for Landslide Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13NW (NW)	14	1	567171 166630

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	Potential for Landslide Ground Stability Hazards Hazard Potential: Low Source: British Geological Survey, National Geoscience Information Service	A13NE (NE)	28	1	567253 166638
	Potential for Landslide Ground Stability Hazards Hazard Potential: Low Source: British Geological Survey, National Geoscience Information Service	A13SW (S)	163	1	567166 166412
	Potential for Landslide Ground Stability Hazards Hazard Potential: Moderate Source: British Geological Survey, National Geoscience Information Service	A13NE (N)	167	1	567268 166808
	Potential for Landslide Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13SW (SW)	195	1	567077 166406
	Potential for Landslide Ground Stability Hazards Hazard Potential: Low Source: British Geological Survey, National Geoscience Information Service	A13SE (E)	230	1	567449 166569
	Potential for Running Sand Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13SW (N)	0	1	567197 166615
	Potential for Running Sand Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13SE (SE)	6	1	567221 166599
	Potential for Running Sand Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13NW (NW)	14	1	567171 166630
	Potential for Running Sand Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13SW (SW)	195	1	567077 166406
	Potential for Shrinking or Swelling Clay Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13SW (N)	0	1	567197 166615
	Potential for Shrinking or Swelling Clay Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13SE (SE)	6	1	567221 166599
	Potential for Shrinking or Swelling Clay Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13NW (NW)	14	1	567171 166630
	Potential for Shrinking or Swelling Clay Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13SW (SW)	195	1	567077 166406
	Radon Potential - Radon Affected Areas Affected Area: The property is in an Intermediate probability radon area (1 to 3% of homes are estimated to be at or above the Action Level). Source: British Geological Survey, National Geoscience Information Service	A13SW (N)	0	1	567197 166615
	Radon Potential - Radon Protection Measures Protection Measure: No radon protective measures are necessary in the construction of new dwellings or extensions Source: British Geological Survey, National Geoscience Information Service	A13SW (N)	0	1	567197 166615

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
11	Contemporary Trade Directory Entries Name: Bennett Grab Services Location: 7, Henley Street, Luddesdown, Gravesend, DA13 0XB Classification: Crane Hire, Sales & Service Status: Inactive Positional Accuracy: Automatically positioned to the address	A17SE (NW)	753	-	566627 167148
11	Contemporary Trade Directory Entries Name: J L Farrington Location: Owls Pen, Henley Street, Luddesdown, Gravesend, Kent, DA13 0XB Classification: Pest & Vermin Control Status: Inactive Positional Accuracy: Automatically positioned to the address	A17SE (NW)	754	-	566600 167116
11	Contemporary Trade Directory Entries Name: J L F Pest Control Location: Owls Pen, Henley Street, Luddesdown, Gravesend, Kent, DA13 0XB Classification: Pest & Vermin Control Status: Inactive Positional Accuracy: Automatically positioned to the address	A17SE (NW)	754	-	566600 167116
12	Points of Interest - Commercial Services Name: J L F Pest Control Location: Owls Pen, Henley Street, Luddesdown, Gravesend, DA13 0XB Category: Contract Services Class Code: Pest and Vermin Control Positional Accuracy: Positioned to address or location	A17SE (NW)	754	6	566600 167116
13	Points of Interest - Recreational and Environmental Name: Play Area Location: DA13 Category: Recreational Class Code: Playgrounds Positional Accuracy: Positioned to an adjacent address or location	A18SW (N)	410	6	567106 167056

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
14	Ancient Woodland Name: Henley Wood Reference: 1486952 Area(m²): 209187.38 Type: Ancient and Semi-Natural Woodland	A13NW (NW)	392	7	566895 166905
15	Ancient Woodland Name: Cobhambury Wood Reference: 1486897 Area(m²): 261257.48 Type: Ancient and Semi-Natural Woodland	A18SE (N)	616	7	567447 167220
16	Ancient Woodland Name: Red/Stonyfield+ Woods Reference: 1486927 Area(m²): 2016463.94 Type: Ancient and Semi-Natural Woodland	A9NW (SE)	782	7	567797 166076
17	Ancient Woodland Name: Not Supplied Reference: 1486704 Area(m²): 27376.54 Type: Ancient and Semi-Natural Woodland	A9NW (SE)	790	7	567737 166004
18	Areas of Adopted Green Belt Authority: Gravesham Borough Council Plan Name: Gravesham Local Plan - Core Strategy Status: Adopted Plan Date: 30th September 2014	A13SW (N)	0	8	567197 166615
19	Areas of Outstanding Natural Beauty Name: Kent Downs Multiple Areas: Y Total Area (m2): 879004390.4543287 Designation Date: 30th July 1968 Source: Natural England	A13SW (N)	0	7	567197 166615
20	Nitrate Vulnerable Zones Name: North Kent Description: Groundwater Source: Environment Agency, Head Office	A13SW (N)	0	2	567197 166615
21	Sites of Special Scientific Interest Name: Halling To Trottiscliffe Escarpment Multiple Areas: Y Total Area (m2): 6005804.82 Source: Natural England Reference: 1003779 Designation Details: Nature Conservation Review Designation Date: 2nd March 1984 Date Type: Notified Designation Details: Special Area Of Conservation Designation Date: 2nd March 1984 Date Type: Notified Designation Details: Site Of Special Scientific Interest Designation Date: 2nd March 1984 Date Type: Notified	A9NW (SE)	782	7	567800 166078
22	Special Areas of Conservation Name: North Downs Woodlands Multiple Areas: Y Total Area (m2): 2873461.83 Source: Natural England Reference: UK0030225 Status: Designated	A9SW (SE)	889	7	567595 165787

Agency & Hydrological	Version	Update Cycle
Contaminated Land Register Entries and Notices Environment Agency - Head Office Tonbridge And Malling Borough Council - Environmental Health Department Sevenoaks District Council - Environmental Health Department Dartford Borough Council - Environmental Health Department Gravesham Borough Council - Public Health Services Medway Council - Environmental Health	November 2023 November 2024 October 2017 September 2017 September 2017 September 2017	Annually Annual Rolling Update Annual Rolling Update Annual Rolling Update Annual Rolling Update Annual Rolling Update
Discharge Consents Environment Agency - Southern Region	April 2025	Quarterly
Enforcement and Prohibition Notices Environment Agency - Southern Region	March 2013	
Integrated Pollution Controls Environment Agency - Southern Region	January 2009	
Integrated Pollution Prevention And Control Environment Agency - South East Region - Kent & South London Area Environment Agency - Southern Region	April 2025 April 2025	Quarterly Quarterly
Local Authority Integrated Pollution Prevention And Control Tonbridge And Malling Borough Council - Environmental Health Department Medway Council - Environmental Health Gravesham Borough Council - Environmental Health Department Dartford Borough Council - Environmental Health Department Sevenoaks District Council - Environmental Health Department	December 2024 June 2014 October 2014 September 2014 September 2014	Variable Variable Variable Variable Variable
Local Authority Pollution Prevention and Controls Tonbridge And Malling Borough Council - Environmental Health Department Medway Council - Environmental Health Gravesham Borough Council - Environmental Health Department Dartford Borough Council - Environmental Health Department Sevenoaks District Council - Environmental Health Department	December 2024 June 2014 October 2014 September 2014 September 2014	Annual Rolling Update Not Applicable Annual Rolling Update Annual Rolling Update Annual Rolling Update
Local Authority Pollution Prevention and Control Enforcements Tonbridge And Malling Borough Council - Environmental Health Department Medway Council - Environmental Health Gravesham Borough Council - Environmental Health Department Dartford Borough Council - Environmental Health Department Sevenoaks District Council - Environmental Health Department	December 2024 June 2014 October 2014 September 2014 September 2014	Variable Variable Variable Variable Variable
Nearest Surface Water Feature Ordnance Survey	April 2025	
Pollution Incidents to Controlled Waters Environment Agency - Southern Region	December 1999	
Historical Prosecutions Environment Agency, Southern Region	March 2013	Not Applicable
Registered Radioactive Substances Environment Agency - Head Office Environment Agency - Southern Region	May 2023 May 2023	
Substantiated Pollution Incident Register Environment Agency - South East Region - Kent & South London Area Environment Agency - Southern Region - Kent Area Environment Agency - Southern Region - Kent and East Sussex	April 2025 April 2025 April 2025	Quarterly Quarterly Quarterly
Water Abstractions Environment Agency - Southern Region	April 2025	Quarterly
Water Industry Act Referrals Environment Agency - Southern Region	October 2017	
Groundwater Vulnerability Map Environment Agency - Head Office	June 2018	As notified

Agency & Hydrological	Version	Update Cycle
Groundwater Vulnerability - Soluble Rock Risk Environment Agency - Head Office	June 2018	As notified
Bedrock Aquifer Designations Environment Agency - Head Office	January 2018	As notified
Superficial Aquifer Designations Environment Agency - Head Office	January 2018	As notified
Source Protection Zones Environment Agency - Head Office	September 2022	Bi-Annually
Extreme Flooding from Rivers or Sea without Defences Environment Agency - Head Office	December 2023	As notified
Flooding from Rivers or Sea without Defences Environment Agency - Head Office	December 2023	As notified
Areas Benefiting from Flood Defences Environment Agency - Head Office	February 2023	
Flood Water Storage Areas Environment Agency - Head Office	January 2024	Quarterly
Flood Defences Environment Agency - Head Office	August 2022	
OS Water Network Lines Ordnance Survey	April 2025	Quarterly
Surface Water 1 in 30 year Flood Extent Environment Agency - Head Office	May 2018	Annually
Surface Water 1 in 100 year Flood Extent Environment Agency - Head Office	May 2018	Annually
Surface Water 1 in 1000 year Flood Extent Environment Agency - Head Office	May 2018	Annually
Surface Water Suitability Environment Agency - Head Office	February 2016	Annually
BGS Groundwater Flooding Susceptibility British Geological Survey - National Geoscience Information Service	May 2013	As notified
Water Framework Directive - Catchment Environment Agency - Head Office	July 2024	Annually
Water Framework Directive - Groundwater Environment Agency - Head Office	July 2024	Annually

Waste	Version	Update Cycle
BGS Recorded Landfill Sites British Geological Survey - National Geoscience Information Service	November 2002	As notified
Historical Landfill Sites Environment Agency - Head Office	October 2024	Quarterly
Integrated Pollution Control Registered Waste Sites Environment Agency - Southern Region	January 2009	Not Applicable
Licensed Waste Management Facilities (Landfill Boundaries) Environment Agency - South East Region - Kent & South London Area Environment Agency - Southern Region - Kent Area Environment Agency - Southern Region - Kent and East Sussex	November 2024 November 2024 November 2024	Quarterly Quarterly Quarterly
Licensed Waste Management Facilities (Locations) Environment Agency - South East Region - Kent & South London Area Environment Agency - Southern Region - Kent Area Environment Agency - Southern Region - Kent and East Sussex	April 2025 April 2025 April 2025	Quarterly Quarterly Quarterly
Local Authority Landfill Coverage Dartford Borough Council - Environmental Health Department Gravesham Borough Council Kent County Council - Waste Management Group Medway Council - Environmental Protection Department Sevenoaks District Council Tonbridge And Malling Borough Council - Environmental Health Department	February 2003 February 2003 February 2003 February 2003 February 2003 February 2003	Not Applicable Not Applicable Not Applicable Not Applicable Not Applicable Not Applicable
Local Authority Recorded Landfill Sites Dartford Borough Council - Environmental Health Department Gravesham Borough Council Kent County Council - Waste Management Group Medway Council - Environmental Protection Department Sevenoaks District Council Tonbridge And Malling Borough Council - Environmental Health Department	October 2018 October 2018 October 2018 October 2018 October 2018 October 2018	
Potentially Infilled Land (Non-Water) Landmark Information Group Limited	December 1999	
Potentially Infilled Land (Water) Landmark Information Group Limited	December 1999	
Registered Landfill Sites Environment Agency - Southern Region - Kent Area Environment Agency - Southern Region - Kent and East Sussex	March 2006 March 2006	Not Applicable Not Applicable
Registered Waste Transfer Sites Environment Agency - Southern Region - Kent Area Environment Agency - Southern Region - Kent and East Sussex	April 2018 April 2018	
Registered Waste Treatment or Disposal Sites Environment Agency - Southern Region - Kent Area Environment Agency - Southern Region - Kent and East Sussex	June 2015 June 2015	

Hazardous Substances	Version	Update Cycle
Control of Major Accident Hazards Sites (COMAH) Health and Safety Executive	September 2024	Bi-Annually
Explosive Sites Health and Safety Executive	March 2017	
Notification of Installations Handling Hazardous Substances (NIHHS) Health and Safety Executive	August 2001	
Planning Hazardous Substance Enforcements Medway Council Tonbridge And Malling Borough Council Dartford Borough Council Sevenoaks District Council Kent County Council Gravesham Borough Council	February 2016 February 2016 June 2023 June 2023 May 2023 October 2015	Variable Variable Variable Variable Variable Variable
Planning Hazardous Substance Consents Medway Council Sevenoaks District Council Tonbridge And Malling Borough Council Dartford Borough Council Kent County Council Gravesham Borough Council	February 2016 February 2016 February 2016 January 2016 January 2016 October 2015	Variable Variable Variable Variable Variable Variable

Geological	Version	Update Cycle
BGS 1:625,000 Solid Geology British Geological Survey - National Geoscience Information Service	January 2009	As notified
BGS Estimated Soil Chemistry British Geological Survey - National Geoscience Information Service	December 2015	As notified
BGS Recorded Mineral Sites British Geological Survey - National Geoscience Information Service	April 2025	Bi-Annually
CBSCB Compensation District Cheshire Brine Subsidence Compensation Board (CBSCB) Cheshire Brine Subsidence Compensation Board (CBSCB)	August 2011 November 2020	As notified
Coal Mining Affected Areas The Coal Authority - Property Searches	February 2023	
Mining Instability Ove Arup & Partners	June 1998	Not Applicable
Non Coal Mining Areas of Great Britain British Geological Survey - National Geoscience Information Service	May 2015	Not Applicable
Potential for Collapsible Ground Stability Hazards British Geological Survey - National Geoscience Information Service	April 2020	As notified
Potential for Compressible Ground Stability Hazards British Geological Survey - National Geoscience Information Service	January 2019	As notified
Potential for Ground Dissolution Stability Hazards British Geological Survey - National Geoscience Information Service	January 2019	As notified
Potential for Landslide Ground Stability Hazards British Geological Survey - National Geoscience Information Service	January 2019	As notified
Potential for Running Sand Ground Stability Hazards British Geological Survey - National Geoscience Information Service	January 2019	As notified
Potential for Shrinking or Swelling Clay Ground Stability Hazards British Geological Survey - National Geoscience Information Service	January 2019	As notified
Radon Potential - Radon Affected Areas British Geological Survey - National Geoscience Information Service	November 2024	Annually
Radon Potential - Radon Protection Measures British Geological Survey - National Geoscience Information Service	November 2024	Annually
Industrial Land Use	Version	Update Cycle
Contemporary Trade Directory Entries Thomson Directories	March 2025	Quarterly
Fuel Station Entries Green Street Advisor (UK) Ltd	February 2025	Quarterly
Points of Interest - Commercial Services PointX	March 2025	Quarterly
Points of Interest - Education and Health PointX	March 2025	Quarterly
Points of Interest - Manufacturing and Production PointX	March 2025	Quarterly
Points of Interest - Public Infrastructure PointX	March 2025	Quarterly
Points of Interest - Recreational and Environmental PointX	March 2025	Quarterly
Underground Electrical Cables National Grid	January 2024	

Sensitive Land Use	Version	Update Cycle
Ancient Woodland Natural England	March 2025	Bi-Annually
Areas of Adopted Green Belt Dartford Borough Council Gravesham Borough Council Medway Council Sevenoaks District Council Tonbridge And Malling Borough Council	July 2024 July 2024 July 2024 July 2024 July 2024	Quarterly Quarterly Quarterly Quarterly Quarterly
Areas of Unadopted Green Belt Dartford Borough Council Gravesham Borough Council Medway Council Sevenoaks District Council Tonbridge And Malling Borough Council	July 2024 July 2024 July 2024 July 2024 July 2024	Quarterly Quarterly Quarterly Quarterly Quarterly
Areas of Outstanding Natural Beauty Natural England	May 2025	Bi-Annually
Environmentally Sensitive Areas Natural England	August 2023	
Forest Parks Forestry Commission	May 2023	Not Applicable
Local Nature Reserves Natural England	March 2025	Bi-Annually
Marine Nature Reserves Natural England	February 2025	Bi-Annually
National Nature Reserves Natural England	January 2025	Bi-Annually
National Parks Natural England	September 2024	Bi-Annually
Nitrate Sensitive Areas Natural England	April 2023	Not Applicable
Nitrate Vulnerable Zones Department for Environment, Food and Rural Affairs (DEFRA - formerly FRCA) Environment Agency - Head Office	April 2016 November 2024	Annually
Ramsar Sites Natural England	February 2025	Bi-Annually
Sites of Special Scientific Interest Natural England	November 2024	Bi-Annually
Special Areas of Conservation Natural England	January 2025	Bi-Annually
Special Protection Areas Natural England	May 2025	Bi-Annually

A selection of organisations who provide data within this report

Data Supplier	Data Supplier Logo
Ordnance Survey	
Environment Agency	
Scottish Environment Protection Agency	
The Coal Authority	
British Geological Survey	 British Geological Survey NATURAL ENVIRONMENT RESEARCH COUNCIL
Centre for Ecology and Hydrology	 Centre for Ecology & Hydrology NATURAL ENVIRONMENT RESEARCH COUNCIL
Natural Resources Wales	
Scottish Natural Heritage	
Natural England	
Public Health England	
Ove Arup	
Stantec UK Ltd	

Contact	Name and Address	Contact Details
1	British Geological Survey - Enquiry Service British Geological Survey, Environmental Science Centre, Keyworth, Nottingham, Nottinghamshire, NG12 5GG	Telephone: 0115 936 3143 Fax: 0115 936 3276 Email: enquiries@bgs.ac.uk Website: www.bgs.ac.uk
2	Environment Agency - National Customer Contact Centre (NCCC) PO Box 544, Templeborough, Rotherham, S60 1BY	Telephone: 03708 506 506 Email: enquiries@environment-agency.gov.uk
3	Environment Agency - Head Office Rio House, Waterside Drive, Aztec West, Almondsbury, Bristol, Avon, BS32 4UD	Telephone: 01454 624400 Fax: 01454 624409
4	Gravesham Borough Council Cygnet House, 132 Windmill Street, Gravesend, Kent, DA12 1AU	Telephone: 01474 564422 Fax: 01474 337546 Website: www.gravesham.gov.uk
5	Kent County Council - Waste Management Group Block H, The Forstal, Beddow Way, Aylesford, Kent, ME20 7BT	Telephone: 01622 605976 Website: www.kent.gov.uk
6	PointX 5-6 Abbey Court, Eagle Way, Sowton, Exeter, Devon, EX2 7HY	Website: www.pointx.co.uk
7	Natural England County Hall, Spetchley Road, Worcester, WR5 2NP	Telephone: 0300 060 3900 Email: enquiries@naturalengland.org.uk Website: www.naturalengland.org.uk
8	Gravesham Borough Council Cygnet House, 132 Windmill Street, Gravesend, Kent, DA12 1BQ	Telephone: 01474 564422 Fax: 01474 337546 Website: www.gravesham.gov.uk
9	Medway Council Civic Centre, Strood, Rochester, Kent, ME2 4AU	Telephone: 01634 727777 Fax: 01634 732756 Website: www.medway.gov.uk
-	Public Health England - Radon Survey, Centre for Radiation, Chemical and Environmental Hazards Chilton, Didcot, Oxfordshire, OX11 0RQ	Telephone: 01235 822622 Fax: 01235 833891 Email: radon@phe.gov.uk Website: www.ukradon.org
-	Landmark Information Group Limited Landmark Information Group, Imperium, Imperial Way, Reading, Berkshire, RG2 0TD	Telephone: 0330 036 6618 Fax: 0844 844 9951 Email: helpdesk@landmark.co.uk Website: www.landmark.co.uk

Please note that the Environment Agency / Natural Resources Wales / SEPA have a charging policy in place for enquiries.



APPENDIX B: Historical Maps

Historical Mapping Legends

Ordnance Survey County Series and Ordnance Survey Plan 1:2,500

	Quarry		Gravel Pit		Sand Pit
	Clay Pit		Shingle		Refuse Heap
	Sloping Masonry		Flat Rock		
	Marsh		Reeds		Osiers
	Rough Pasture		Furze		Wood
	Mixed Wood		Brushwood		Orchard
	Fir		Ford		Stepping Stones
	Ferry		Waterfall		Lock
	Trig. Station		Altitude at Trig. Station		
	B.M. 325.9		Bench Mark		Surface Level
	Arrow denotes flow of water		Antiquities (site of)		
	Cutting		Embankment		
	Railway crossing Road		Level Crossing		Road crossing Railway
	Railway crossing River or Canal		Road over single stream		Road over River or Canal
	County Boundary (Geographical)		County & Civil Parish Boundary		Administrative County & Civil Parish Boundary
	County Borough Boundary (England)		County Burgh Boundary (Scotland)		
	Boundary Post or Stone		Police Call Box		
	Bridle Road		Pump		
	Electricity Pylon		Signal Post		
	Foot Bridge		Sluice		
	Foot Path		Spring		
	Guide Post or Board		Telephone Call Box		
	Mile Stone		Trough		
	Mooring Post or Ring		Well		

Ordnance Survey Plan, Additional SIMs and Supply of Unpublished Survey Information 1:2,500 and 1:1,250

	Inactive Quarry, Chalk Pit or Clay Pit		Active Quarry, Chalk Pit or Clay Pit
	Rock		Boulders
	Cliff		Slopes
	Roofed Building		Glazed Roof Building
	Sloping Masonry		Archway
	Non-Coniferous Tree (surveyed)		Coniferous Tree (surveyed)
	Non-Coniferous Trees (not surveyed)		Coniferous Trees (not surveyed)
	Orchard Tree		Scrub
	Coppice, Osier		Reeds
	Rough Grassland		Heath
	Direction of water flow		Bench Mark
	Cave Entrance		Triangulation Station
	Electricity Transmission Line		Antiquity (site of)
	County Boundary (Geographical)		County & Civil Parish Boundary
	County & Civil Parish Boundary		Civil Parish Boundary
	Admin. County or County Bor. Boundary		London Borough Boundary
	Symbol marking point where boundary mereing changes		
	Beer House		Pillar, Pole or Post
	Boundary Post or Stone		Post Office
	Capstan, Crane		Public Convenience
	Chimney		Public House
	Drinking Fountain		Pump
	Electricity Pillar or Post		Signal Box or Bridge
	Fire Alarm Pillar		Signal Post or Light
	Foot Bridge		Spring
	Guide Post		Tank or Track
	Hydrant or Hydraulic		Telephone Call Box
	Level Crossing		Telephone Call Post
	Manhole		Trough
	Mile Post or Mooring Post		Water Point, Water Tap
	Mile Stone		Well
	Normal Tidal Limit		Wind Pump

Large-Scale National Grid Data 1:2,500 and 1:1,250

	Cliff		Slopes
	Rock		Rock (scattered)
	Boulders		Boulders (scattered)
	Positioned Boulder		Scree
	Non-Coniferous Tree (surveyed)		Coniferous Tree (surveyed)
	Non-Coniferous Trees (not surveyed)		Coniferous Trees (not surveyed)
	Orchard Tree		Scrub
	Coppice, Osier		Reeds
	Rough Grassland		Heath
	Direction of water flow		Triangulation Station
	Electricity Transmission Line		Antiquity (site of)
	Bench Mark		Buildings with Building Seed
	Roofed Building		Glazed Roof Building
	Civil parish/community boundary		
	District boundary		
	County boundary		
	Boundary post/stone		
	Boundary mereing symbol (note: these always appear in opposed pairs or groups of three)		
	Barracks		Pillar, Pole or Post
	Battery		Post Office
	Cemetery		Public Convenience
	Chimney		Pump
	Cistern		Pumping Station
	Dismantled Railway		Place of Worship
	Electricity Generating Station		Sewage Pumping Station
	Electricity Pole, Pillar		Signal Box or Bridge
	Electricity Sub Station		Signal Post or Light
	Filter Bed		Spring
	Fountain / Drinking Ftn.		Tank or Track
	Gas Valve Compound		Trough
	Gas Governor		Wind Pump
	Guide Post		Water Point, Water Tap
	Manhole		Works (building or area)
	Mile Post or Mile Stone		Well

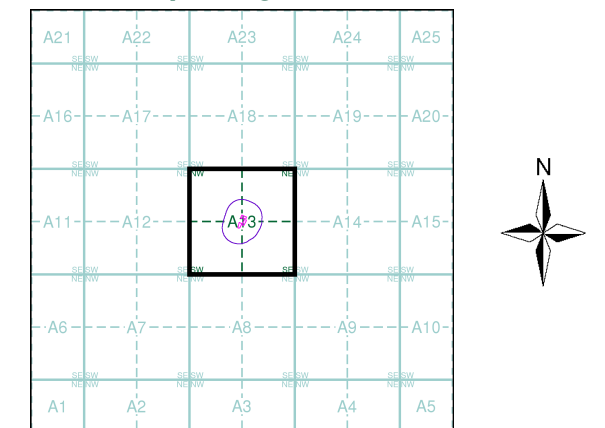


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Historical Mapping & Photography included:

Mapping Type	Scale	Date	Pg
Kent	1:2,500	1865 - 1894	2
Kent	1:2,500	1867 - 1895	3
Kent	1:2,500	1895	4
Kent	1:2,500	1895	5
Kent	1:2,500	1896	6
Kent	1:2,500	1908 - 1909	7
Kent	1:2,500	1936 - 1939	8
Ordnance Survey Plan	1:2,500	1963	9
Additional SIMs	1:2,500	1990	10
Large-Scale National Grid Data	1:2,500	1993	11
Historical Aerial Photography	1:2,500	1999	12

Historical Map - Segment A13



Order Details

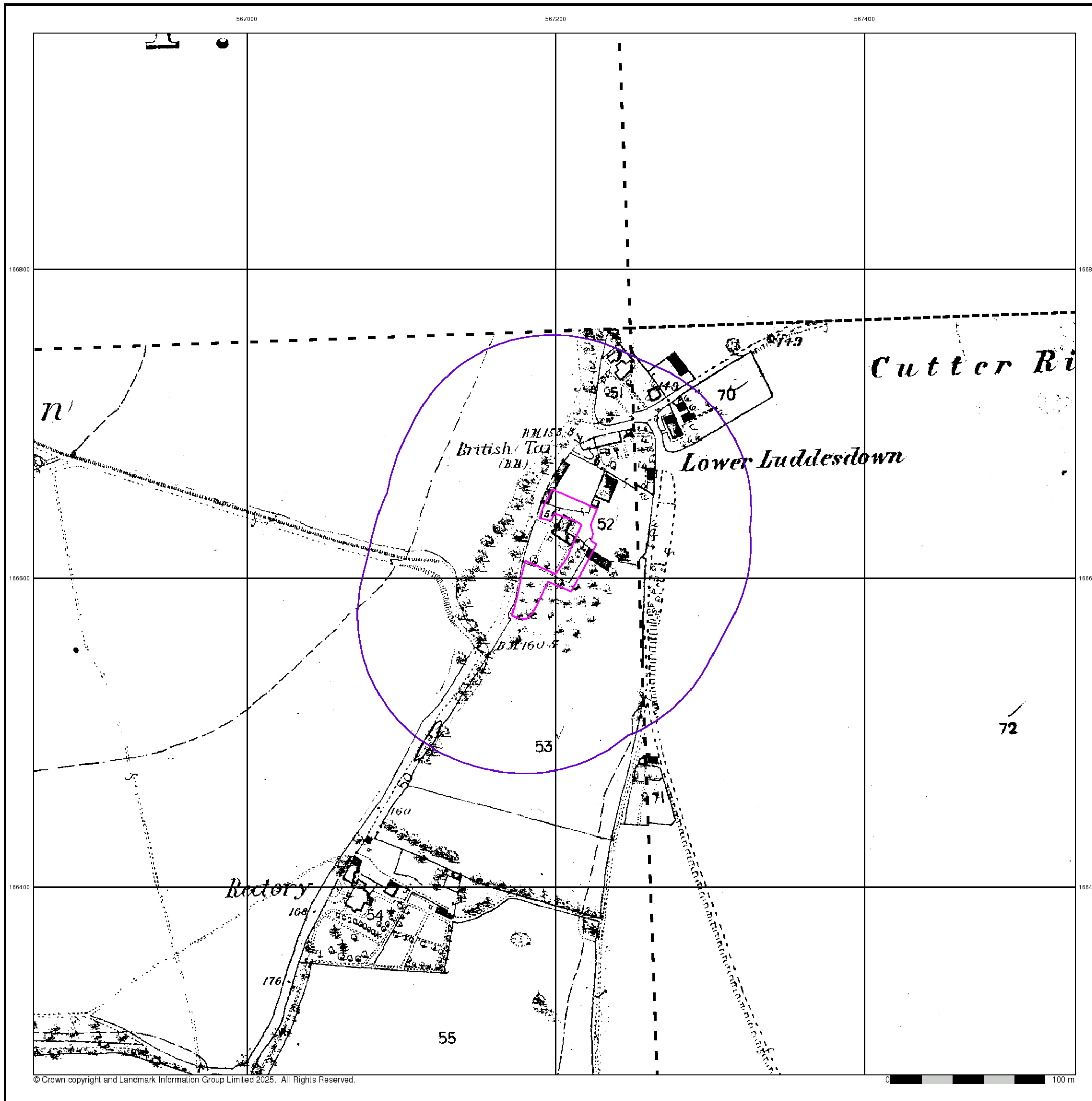
Order Number: 377683723_1_1
Customer Ref: 5318
National Grid Reference: 567200, 166610
Slice: A
Site Area (Ha): 0.16
Search Buffer (m): 100

Site Details

The Lion, Luddesdown Road, Luddesdown, GRAVESEND, DA13 0XE

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Kent

Published 1867 - 1895

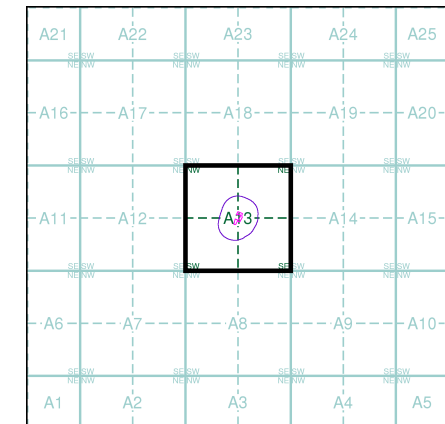
Source map scale - 1:2,500

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 and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below 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.

Map Name(s) and Date(s)

018_07 1895 1:2,500	018_08 1895 1:2,500
018_11 1894 1:2,500	018_12 1867 1:2,500

Historical Map - Segment A13



Order Details

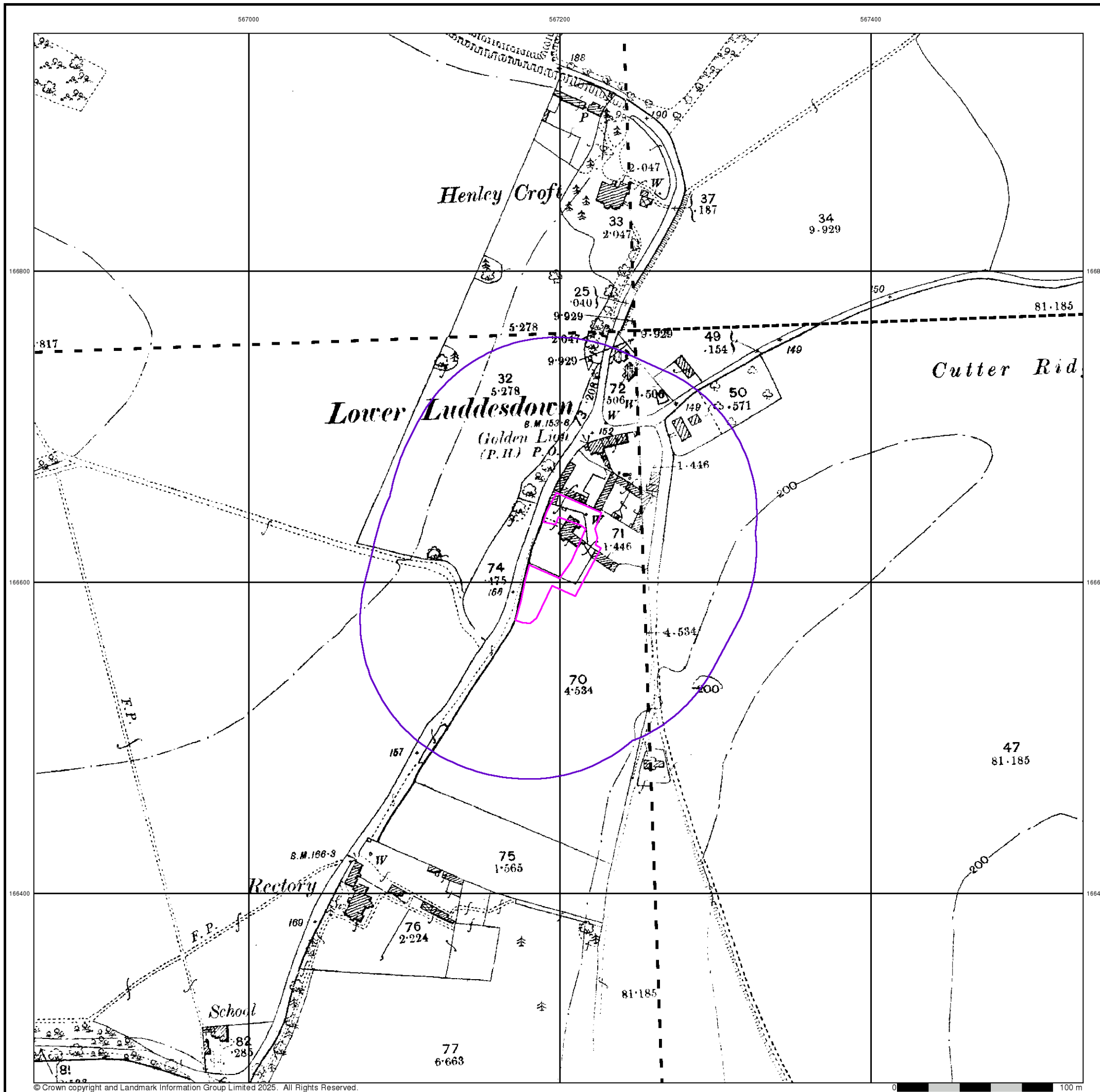
Order Number: 377683723_1_1
Customer Ref: 5318
National Grid Reference: 567200, 166610
Slice: A
Site Area (Ha): 0.16
Search Buffer (m): 100

Site Details

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Kent

Published 1896

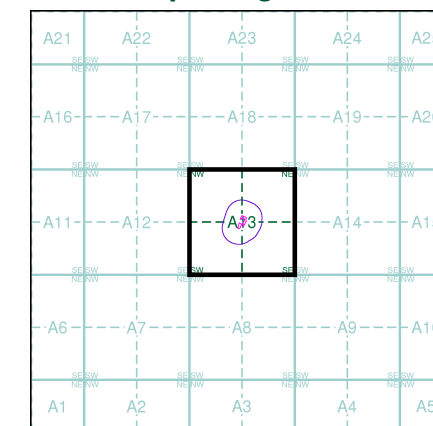
Source map scale - 1:2,500

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 and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below 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.

Map Name(s) and Date(s)

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018_11 1896 1:2,500	018_12 1896 1:2,500

Historical Map - Segment A13



Order Details

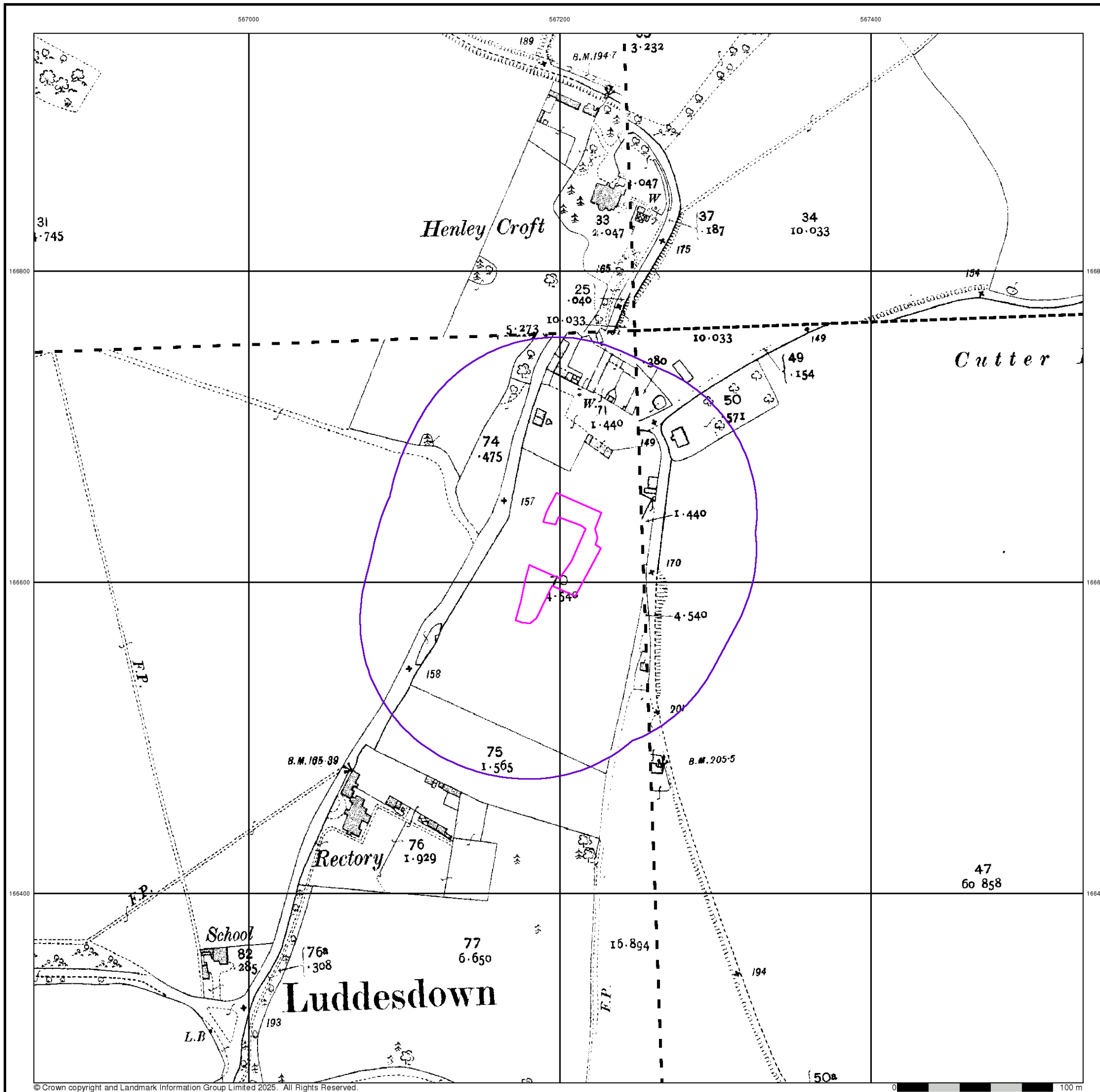
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Search Buffer (m): 100

Site Details

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Kent

Published 1908 - 1909

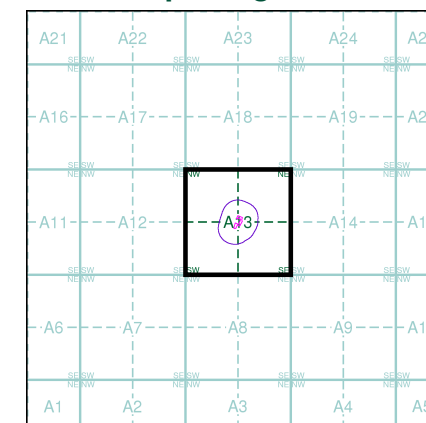
Source map scale - 1:2,500

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 and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below 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.

Map Name(s) and Date(s)

018_07 1908 1:2,500	018_08 1909 1:2,500
018_11 1908 1:2,500	018_12 1909 1:2,500

Historical Map - Segment A13



Order Details

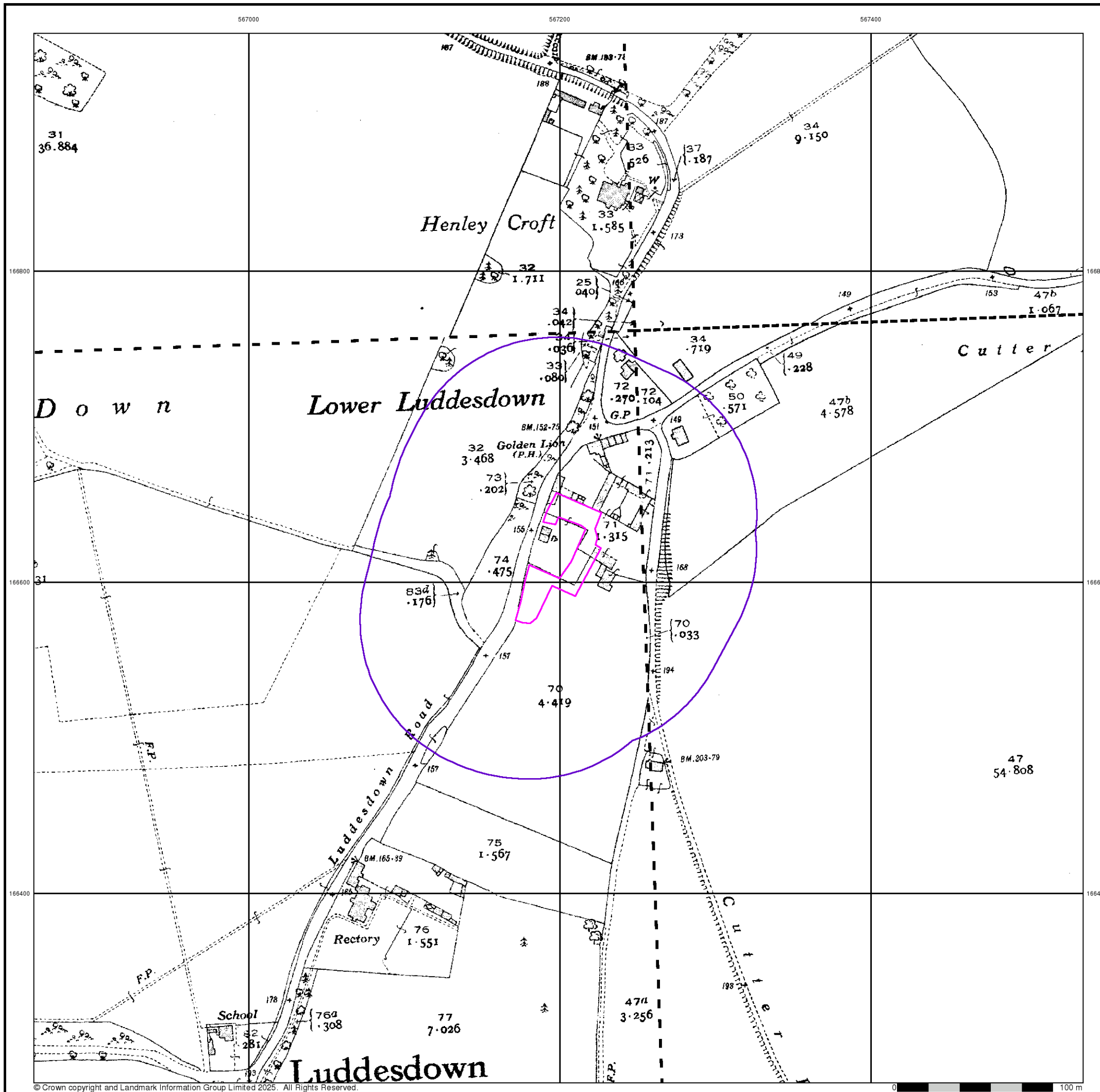
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Site Area (Ha): 0.16
Search Buffer (m): 100

Site Details

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Kent

Published 1936 - 1939

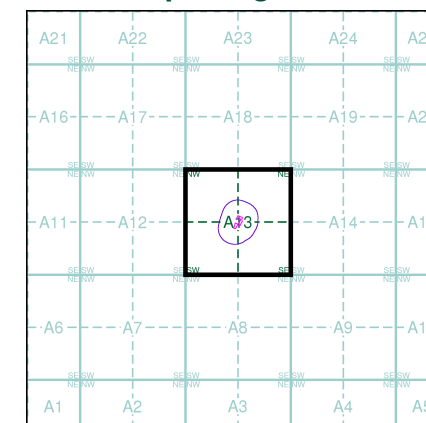
Source map scale - 1:2,500

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 and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below 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.

Map Name(s) and Date(s)

018_07 1939 1:2,500	018_08 1939 1:2,500
018_11 1936 1:2,500	018_12 1936 1:2,500

Historical Map - Segment A13



Order Details

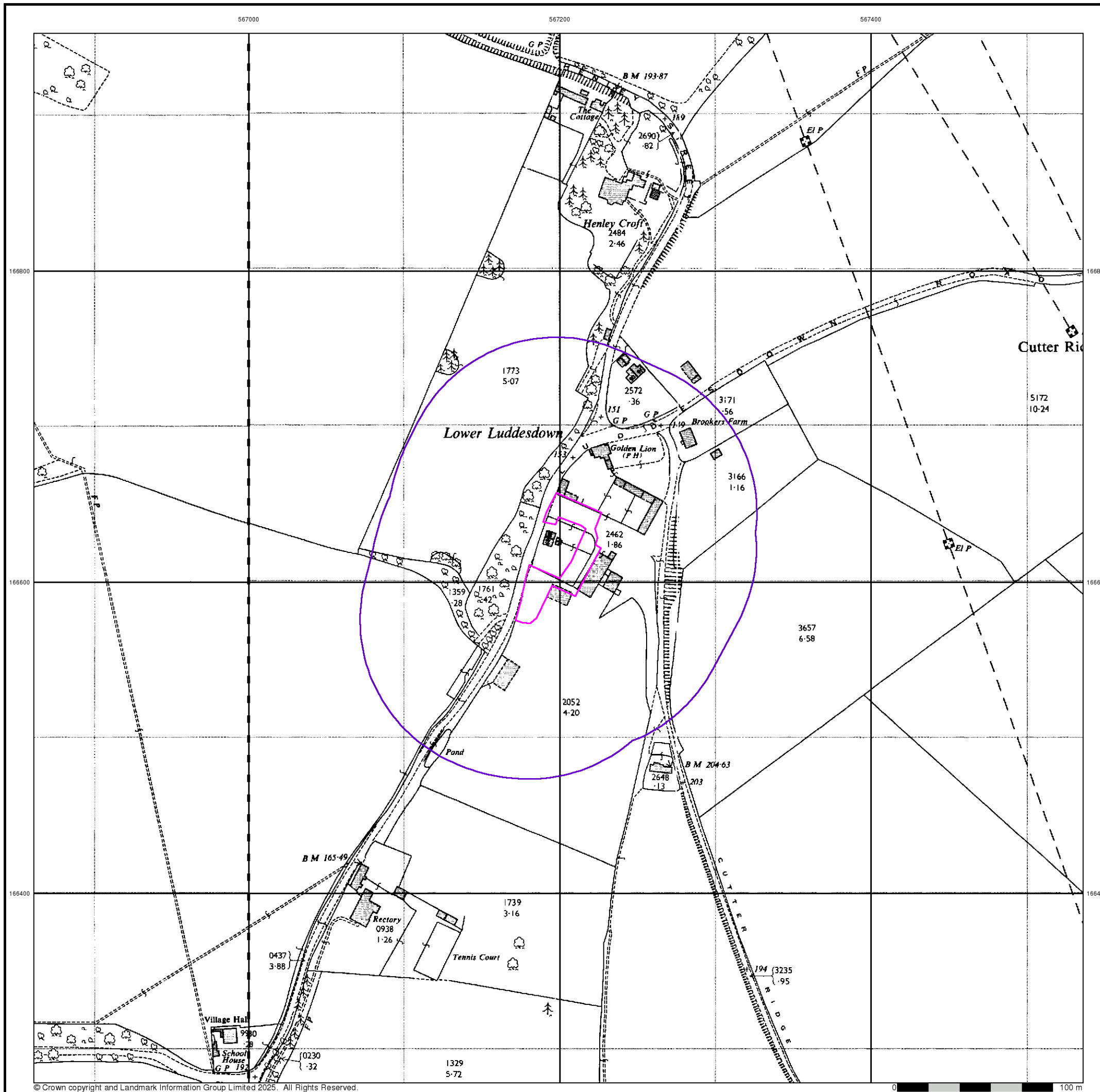
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National Grid Reference: 567200, 166610
Slice: A
Site Area (Ha): 0.16
Search Buffer (m): 100

Site Details

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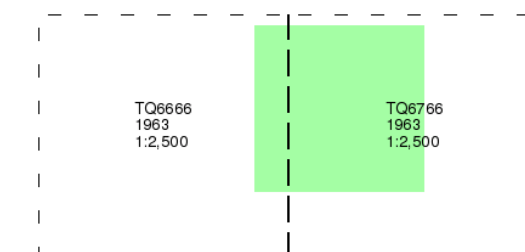
Ordnance Survey Plan

Published 1963

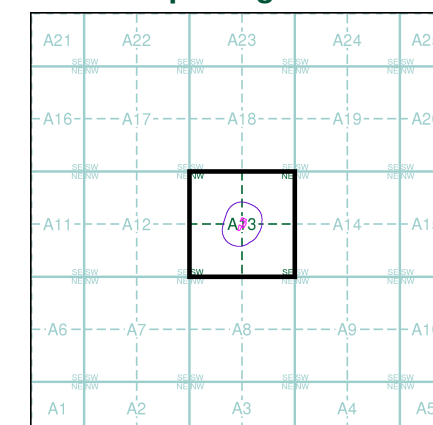
Source map scale - 1:2,500

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 and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below 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.

Map Name(s) and Date(s)



Historical Map - Segment A13



Order Details

Order Number: 377683723_1_1
Customer Ref: 5318
National Grid Reference: 567200, 166610
Slice: A
Site Area (Ha): 0.16
Search Buffer (m): 100

Site Details

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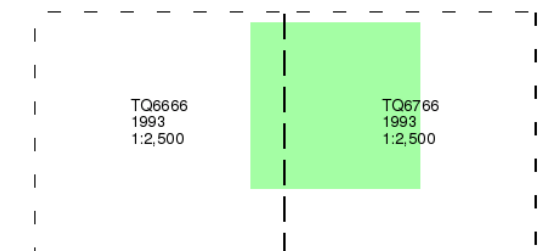
Large-Scale National Grid Data

Published 1993

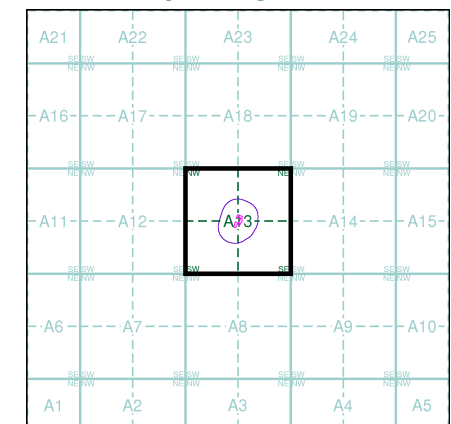
Source map scale - 1:2,500

'Large Scale National Grid Data' superseded SIM cards (Ordnance Survey's 'Survey of Information on Microfilm') in 1992, and continued to be produced until 1999. These maps were the fore-runners of digital mapping and so provide detailed information on houses and roads, but tend to show less topographic features such as vegetation. These maps were produced at both 1:2,500 and 1:1,250 scales.

Map Name(s) and Date(s)



Historical Map - Segment A13



Order Details

Order Number: 377683723_1_1
Customer Ref: 5318
National Grid Reference: 567200, 166610
Slice: A
Site Area (Ha): 0.16
Search Buffer (m): 100

Site Details

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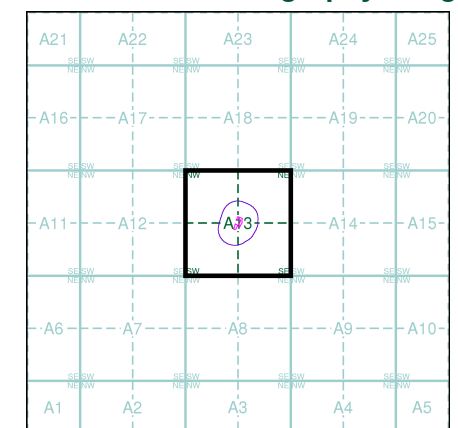
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Historical Aerial Photography

Published 1999

This aerial photography was produced by Getmapping, these vertical aerial photographs provide a seamless, full colour survey of the whole of Great Britain

Historical Aerial Photography - Segment A13



Order Details

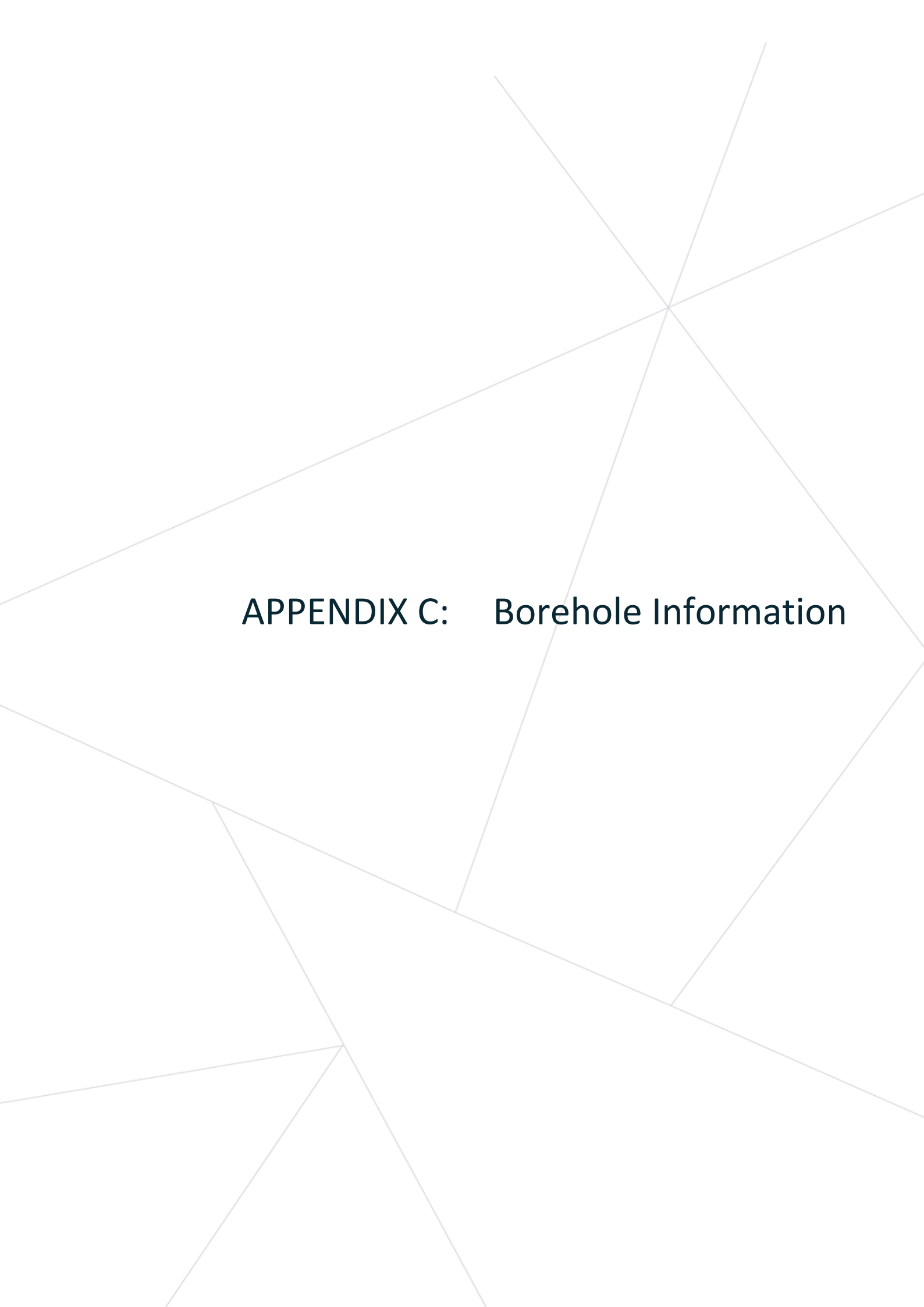
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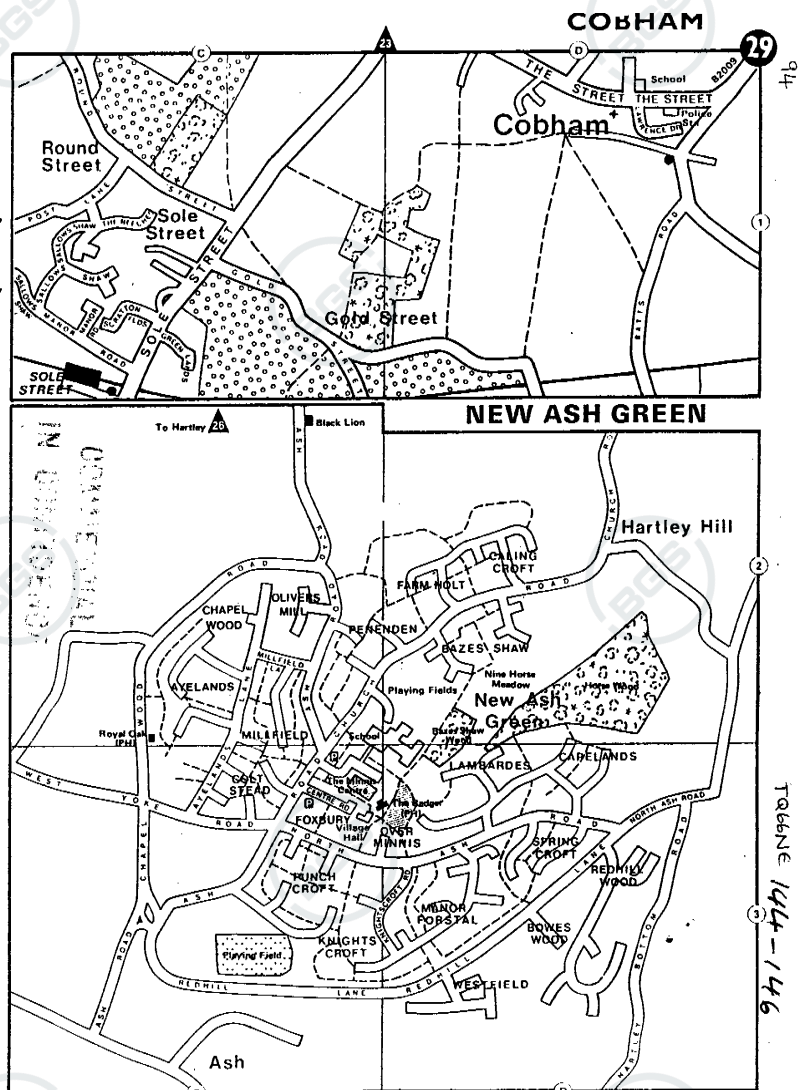
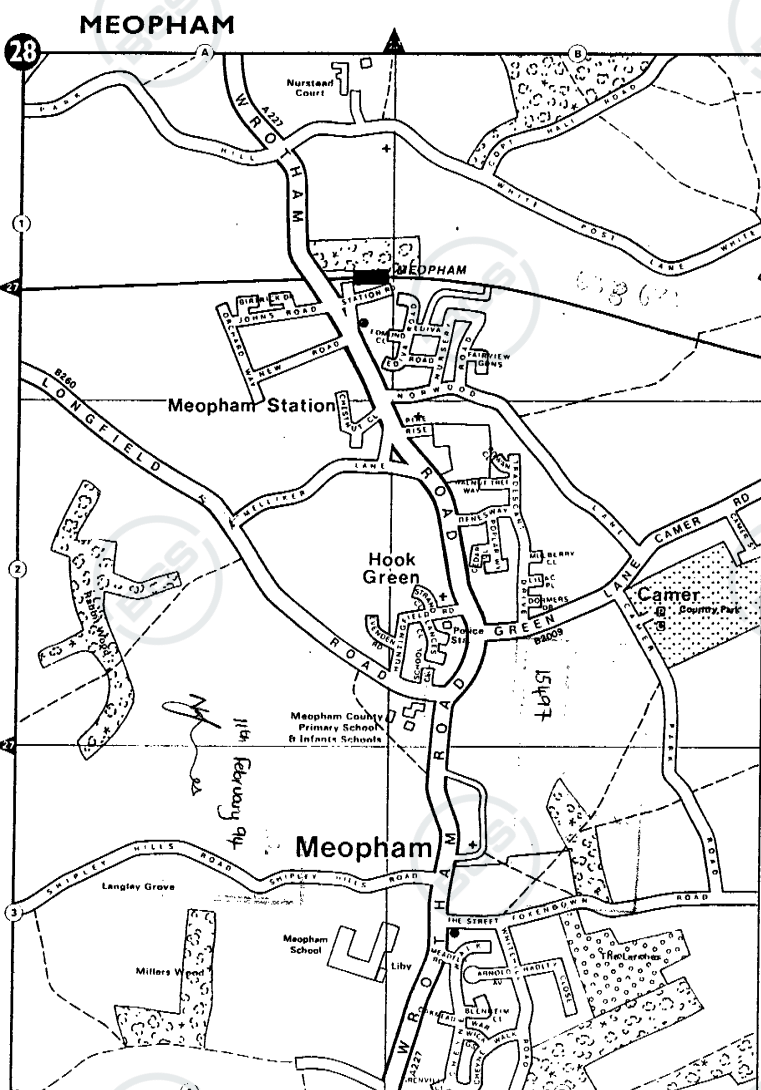
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DA13 0XE

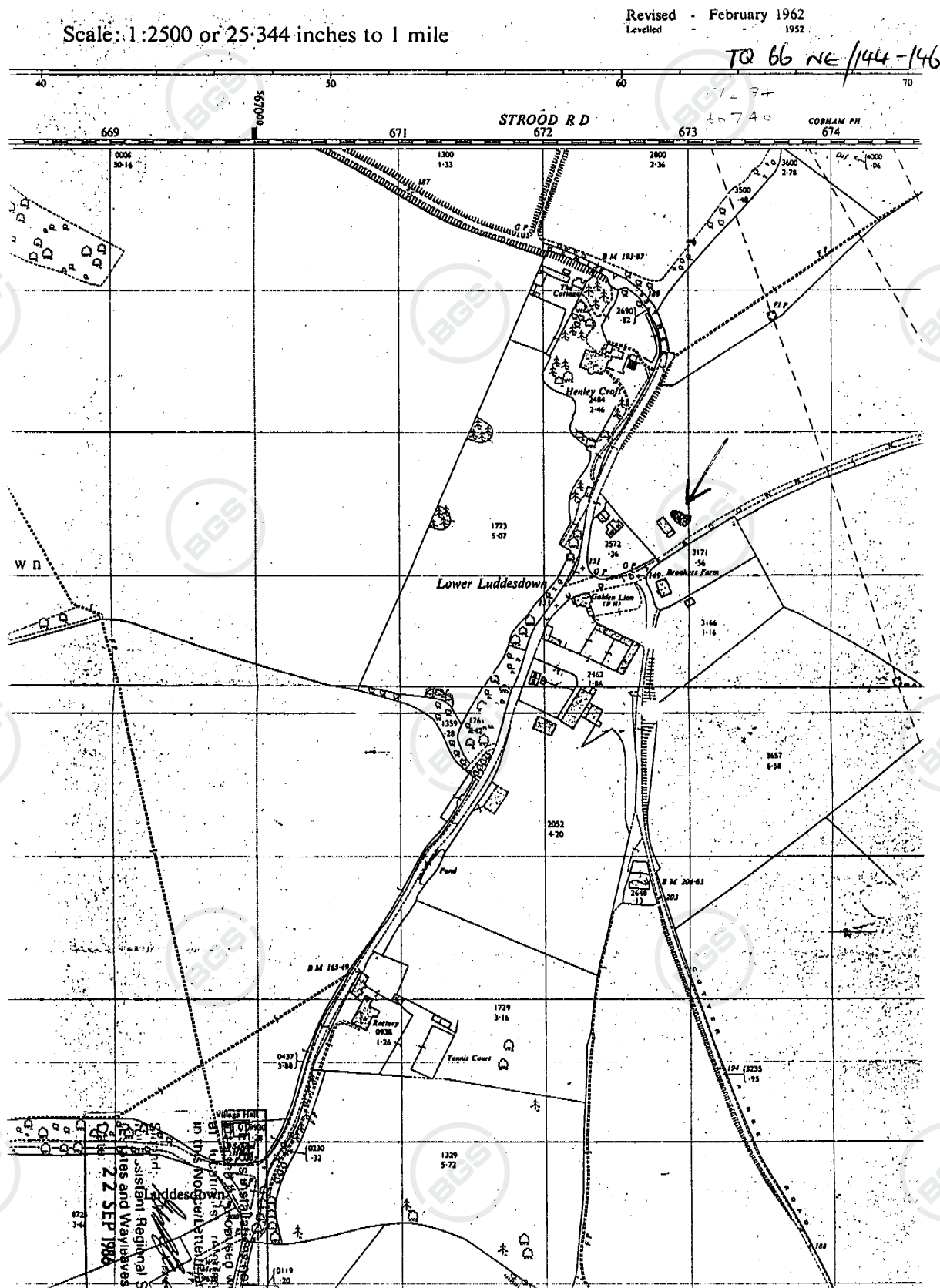
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APPENDIX C: Borehole Information







GRAVESHAM BOROUGH COUNCIL							BOREHOLE				
LUDESSESDOWNE ROAD, LOWER LUDESSESDOWNE							1				
BORING EQUIPMENT			BOREHOLE DIAMETER		LOCATION		SHEET 1 OF 1				
LIGHT PERCUSSION			200mm		E = 67294 N = 66740		GROUND LEVEL METRES A.O.D.				
DATE COMMENCED			25th November 1986		DATE COMPLETED		25th November 1986				
DATE & DEPTH (m)	DEPTH OF CASING (m)	DEPTH TO WATER (m)	SAMPLES AND INSITU TESTING				LEGEND	DESCRIPTION OF STRATA	DEPTH (thickness of stratum) (m)	PIEZ. DEP. (m)	
No.	TYPE	BLOWS	DEPTH (m)								
								TOPSOIL	0.30		
1	●		0.50					Firm brown slightly sandy clayey SILT with much rounded flint up to 50mm and chalk pellets up to 5mm.	0.85		
2	●		1.00					Firm/dense brown calcareous clayey SILT and white chalk pellets up to 2mm with flints up to 2mm with flints up to 70mm.			
								COOMBE DEPOSIT			
3	●		2.00					Hard off-white chalk easily puttyfied. Joints closed and structure not easily defined. Vertical joints apparent with yellow staining and limonite speckles.	1.90		
4	●		3.00								
5	●		4.00								
6	●		5.00					Grey chalk marl 20mm thick in some horizons.			
7	●		6.00					Marcasite nodule found 10mm diameter.			
8	●		7.00								
9	■		8.00		75			MIDDLE CHALK			
10	●		8.45								
			8.60					End of borehole.	8.60		

REMARKS

Scale 1:50

KEY

Water struck

Morning water level

Disturbed Sample

Bulk Disturbed Sample

Standard Penetration Test



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