



# **DESK STUDY REPORT LAND AT CENTRAL AVENUE GRAVESEND**

**Prepared for: Avery Healthcare Limited, Octopus Healthcare  
and Willowbank Healthcare Developments Ltd**

**ASL Report No. 002-21-719-11**

**February 2021**

**ASL**

Holly Farm Business Park  
Honiley  
Warwickshire  
CV8 1NP

**T:** +44(0)1926485508

**F:** +44(0)1926485507

**E:** [info@aslenvironmental.co.uk](mailto:info@aslenvironmental.co.uk)

**W:** [www.aslenvironmental.co.uk](http://www.aslenvironmental.co.uk)

---



# DESK STUDY REPORT LAND AT CENTRAL AVENUE GRAVESEND

## CONTENTS

|             |                                                                    |           |
|-------------|--------------------------------------------------------------------|-----------|
| <b>1</b>    | <b>INTRODUCTION .....</b>                                          | <b>3</b>  |
| <b>2</b>    | <b>THE SITE .....</b>                                              | <b>4</b>  |
| <b>3</b>    | <b>GEOLOGY .....</b>                                               | <b>5</b>  |
| <b>4</b>    | <b>HYDROGEOLOGY .....</b>                                          | <b>5</b>  |
| <b>5</b>    | <b>HYDROLOGY .....</b>                                             | <b>6</b>  |
| <b>6</b>    | <b>SITE HISTORY .....</b>                                          | <b>7</b>  |
| <b>7</b>    | <b>STATUTORY DATABASE SEARCH .....</b>                             | <b>9</b>  |
| 7.1         | General .....                                                      | 9         |
| 7.2         | Database Search Results .....                                      | 9         |
| 7.3         | Environment Agency Search Results .....                            | 9         |
| 7.4         | Geological Hazards .....                                           | 10        |
| 7.5         | Contemporary Trade References .....                                | 10        |
| <b>8</b>    | <b>UNEXPLODED ORDNANCE .....</b>                                   | <b>12</b> |
| <b>9</b>    | <b>ASSESSMENT OF POTENTIAL CONTAMINATION RISKS .....</b>           | <b>13</b> |
| 9.1         | General .....                                                      | 13        |
| 9.2         | On-Site Sources of Contamination .....                             | 13        |
| 9.3         | Off-Site Sources of Contamination .....                            | 13        |
| 9.4         | Receptors and Pathways .....                                       | 14        |
| 9.5         | Potential Pollutant Linkages and Qualitative Risk Assessment ..... | 14        |
| <b>10.0</b> | <b>GEOTECHNICAL CONSIDERATIONS .....</b>                           | <b>17</b> |
| <b>11.0</b> | <b>FURTHER WORK .....</b>                                          | <b>19</b> |
| <b>12.0</b> | <b>SUMMARY AND RECOMMENDATIONS .....</b>                           | <b>20</b> |
|             | <b>REFERENCES .....</b>                                            | <b>22</b> |
|             | <b>GENERAL NOTES .....</b>                                         | <b>23</b> |

### TABLES

- 1 Summary of Site History

### FIGURES

- 1 Site Location
- 2 Site Layout Plan
- 3 Conceptual Site Model

### APPENDICES

- I Proposed Development Layout
- II Environmental Database Search Results
- III Historical Map Extracts
- IV UXO Desk Top Study



## **DESK STUDY REPORT LAND AT CENTRAL AVENUE GRAVESEND**

### **1 INTRODUCTION**

In January 2021, ASL were instructed by Avery Healthcare Group to undertake a desk study of the site known as Land at Central Avenue, Gravesend. The instruction to proceed with these works was received by email from Avery Healthcare Group by email dated 28<sup>th</sup> January 2021 together with associated purchase order number HL-Gravesend/010, dated 4<sup>th</sup> February 2021.

The purpose of this desk study is to determine any potential environmental and geotechnical risk issues and liabilities pertaining to the future development of the site. It is understood that the proposed development comprises the demolition of the existing structures and redevelopment to provide a new 62 bedroom care home (Use Class C2) together with associated access, car and cycle parking, structural landscaping, and amenity space provision. A proposed development layout is presented as Appendix I.

This assessment uses available information on the site and the surrounding area sourced from environmental databases maintained by the Environment Agency (EA), historical ordnance survey maps, a site walkover survey, a review of the site's environmental setting and an appraisal of the current and former land uses with a view to determining the potential for contamination to be present at the site. This report presents the findings of this assessment together with the factual data sourced during the course of these works which are appended for completeness.

It should be noted that this assessment cannot determine the actual levels of contamination present at the site only the potential for contamination to be present. The general notes section should be consulted in relation to the limitations of this report.

This report has been prepared for the sole benefit of the joint Clients, Avery Healthcare Limited, Octopus Healthcare and Willowbank Healthcare Developments Ltd and their representatives and agents. The report has been written based on the results of data searches and site conditions encountered at the time of the assessment. Future changes in legislation and advances in current best practises or provision of more detailed design proposals will result in this report requiring review and possible further assessment after the date of issue. The general notes section within this report should be noted in relation to the limitations of this assessment.



## 2 THE SITE

The site is located to the south-west of the junction between Central Avenue to the east and Ascot Road to the north approximately 1.8km to the south of Gravesend town centre at approximate National Grid Reference TQ649724 as presented as Figure 1.

The site comprises a rectangular shaped piece of land with maximum dimensions of approximately 65m by 60m with the long axis aligned east to west. The site is generally flat lying with only minor elevation changes present.

The site is separated into two main areas.

The first area comprises the majority of the site in the north and east. This portion of the site is occupied by the Ascot Arms public house. During the site walkover the public house was not in use and the windows and doors had been secured against unauthorised access with steel sheet panels.

The public house is constructed with brick walls and a sloping tiled roof and extends to two storeys in height. A cellar hatch is located centrally to the northern elevation indicating that a basement structure is present. The nature and extent of the basement structure is not known.

The public house is generally surrounded by areas of tarmacadam hardstanding to the north-east, north and north-west used for access and vehicle parking. An electrical substation is located in the north-west of this area.

The public house is generally surrounded by soft landscaped areas to the south-east, south and west. Locally picnic benches are present in the south providing outside seating areas. A covered decking area is located on the south-eastern elevation of the public house. A palisade fence runs from the south-east of the site to the north-west of the site. This palisade fence separates the site from the remainder of the site in the south and south-west and is surrounded by mature trees.

The second area in the south and south-west comprises a portion of a larger grassed playing field.

The northern and eastern boundaries of the public house portion of the site are generally formed by heras fencing and locally concrete Jersey Blocks at vehicle access points to prevent unauthorised access. The western boundary is formed by wooden fencing in the north and metal palisade fencing centrally and in the south. The southern boundary is not physically marked with this area open to further areas of grassed playing field.

The site is bound to the east by Central Avenue with residential dwellings beyond, to the north by Ascot Road with residential dwellings beyond, to the west by Aintree Close with residential dwellings beyond and to the south by a playing field with residential dwellings beyond.

The general site layout is presented as Figure 2.

It is understood that the proposed development comprises the demolition of the existing structures and redevelopment to provide a new 62 bedroom care home (Use Class C2) together with associated access, car and cycle parking, structural landscaping, and amenity space provision. A proposed development layout is presented as Appendix I.



### 3 GEOLOGY

The British Geological Survey (BGS) Sheets No. 271 – Dartford (Solid and Drift) and the Geology of Britain Viewer indicates the site to be devoid of drift deposits and to be directly underlain by solid geology comprising the Lewes Nodular Chalk Formation, Seaford Chalk Formation and Newhaven Chalk Formation (Undifferentiated). The chalk stratum is generally described as 'white, soft with courses of flint'. The chalk stratum is indicated to be 70m thick in the vicinity of the site.

In addition to the published geology, it is expected that Made Ground and/or Topsoil will be present at the surface of beneath hardstandings given the current use of the site.

The site is located in an area that may not be affected by coal mining and at unlikely risk from non-coal mining activities.

The site is located in an area at 'inconclusive' risk from rock mining. There is one man made mining cavity located within 0.5km of the site. The listing relates to a vertical shaft with chambers at the base for the extraction of chalk located approximately 270m to the south.

There are no BGS recorded mineral sites located within 0.5km of the site.

The site is located in an area indicated to have a very significant soluble rock risk with a 'high possibility' of occurrence, however there are no recorded natural cavities in the vicinity of the site.

The environmental database search indicates the site is in a lower probability radon area and that new developments or extensions do not require radon protection measures.

Further details are presented in Appendix II.

### 4 HYDROGEOLOGY

The chalk stratum is classified by the EA as a Principal Aquifer defined 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'.

There are four abstractions from groundwater located within 1.0km of the site. The first listing relates to the abstraction of groundwater for industrial processing located approximately 445m to the east. The second listing relates to the abstraction of groundwater for spray irrigation located approximately 755m to the south-west. The remaining listings relate to the abstraction of groundwater for potable supply located approximately 765m and 840m to the north.

The site is located in a Source Protection Zone (SPZ) II (Outer Protection Zone) and an SPZ III (Total Catchment). A boundary with a SPZ I (inner protection zone) is located approximately 265m to the north.

There is one discharge consent to groundwater within 0.5km of the site. This listing relates to sewage discharges into the land located approximately 195m to the east.

The site is located in an area with a limited potential for groundwater flooding to occur.



The site is not located in a groundwater nitrate vulnerable zone.

Further details are presented in Appendix II.

## **5 HYDROLOGY**

The nearest surface water feature is an unnamed stream located approximately 815m to the west. The unnamed stream is not classified chemically or biologically by the EA in the vicinity of the site.

There is one abstraction from surface water within 1.0km of the site. This listing relates to the abstraction of surface water for sand and gravel washing located approximately 760m to the north.

There are two discharge consents to surface water within 0.5km of the site. Both listings relate to the discharge of sewerage located approximately 465m to the north-west.

The site is not indicated to be at risk from flooding from rivers and seas without defences.

The western half of the site and the central eastern portion of the site are indicated to be at risk from surface water flooding.

The site is not located in a surface water nitrate vulnerable zone.

Further details are presented in Appendix II.



## 6 SITE HISTORY

The history of the site has been derived from historical OS maps dating back to 1869. The map extracts are presented in Appendix III. Table 1 below presents a summary of the key developments in and around the site shown on the historical map extracts.

**Table 1 Summary of Site History**

| Date of Map Extract                   | On site and surrounding Land-use                                                                                                                                                                                                                                                                                                                                                                                                                |
|---------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1869–1882<br>(1:2500 & 1:10560)       | The site generally comprises undeveloped agricultural land. A track transects the site from north to south in the vicinity of the eastern boundary.<br>The immediate surrounding area generally comprises undeveloped agricultural land.<br>Minor residential and agricultural development has occurred in excess of approximately 300m to the north-east, north-west and north.                                                                |
| 1896-1899<br>(1:2500 & 1:10560)       | The site and immediate surrounding area remain generally unchanged.<br>Residential development has occurred in excess of approximately 300m to the north-east, north and north-west.<br>A nunnery and cemetery are located approximately 490m to the north.                                                                                                                                                                                     |
| 1908-1910<br>(1:2500 & 1:10560)       | The site and immediate surrounding area remain generally unchanged.<br>Residential development has occurred in excess of approximately 250m to the north, north-east and north-west.<br>A brick works and associated pit are located approximately 500m to the north-west.                                                                                                                                                                      |
| 1931-32<br>(1:10560)                  | The site remains generally unchanged.<br>significant residential development has occurred surrounding the site at distances greater than approximately 75m. Residential development has occurred over the extent of the pit associated with the brick works to the north-west.                                                                                                                                                                  |
| 1936-38<br>(1:2500 & 1:10560)         | The site has been developed with a public house at the general location seen today.<br>The land directly to the west and south is indicated to be a sports ground together with associated pavilions.<br>Residential development has occurred directly to the north and east and further to the west.<br>Residential development has also occurred in the wider area including over then remaining extent of the brick works to the north-west. |
| 1946-47<br>(1:10560 & Aerial Photo)   | The site and immediate surrounding area remain generally unchanged.<br>Residential development has occurred in the wider surrounding area with the closest are located approximately 500m to the east.                                                                                                                                                                                                                                          |
| 1954<br>(1:1250)                      | A new parking area is present in the north of the site.<br>A small paint spraying works is located approximately 300m to the north-west.                                                                                                                                                                                                                                                                                                        |
| 1961-62<br>(1:10000)                  | The site remains generally unchanged.<br>Residential development has occurred in the wider surrounding area with the closest areas located approximately 750m to the south-east.                                                                                                                                                                                                                                                                |
| 1966<br>(1:10000)                     | The site remains generally unchanged.<br>Residential development has occurred in the wider surrounding area with the closest areas located approximately 300m to the south.                                                                                                                                                                                                                                                                     |
| 1972-75<br>(1:1250 & 1:10560)         | A small ancillary building is located centrally in the north.<br>Lock-up garages are located approximately 70m to the north.<br>Minor residential development has occurred surrounding the site including over a portion of the playing field to the south.                                                                                                                                                                                     |
| 1980-87<br>(1:1250 & 1:10000)         | An electrical substation is located in the north-west of the site.<br>A playground is located to the south by 1986.<br>Residential development has occurred directly to the west. Residential development has also occurred in the wider surrounding area with the closest areas located approximately 250m to the south.                                                                                                                       |
| 1991-93<br>(1:2500 & 1:10000)         | The site and immediate surrounding area remain generally unchanged.                                                                                                                                                                                                                                                                                                                                                                             |
| 1999-2020<br>(1:10000 & Aerial Photo) | The site and immediate surrounding area remain generally unchanged.                                                                                                                                                                                                                                                                                                                                                                             |

The site history dating back to 1869 has generally comprised undeveloped agricultural land and a public house since at least 1936. The public house has undergone a number of phases of minor development including an electrical substation that was constructed by at least 1986.



The immediate surrounding area has generally comprised agricultural land, residential dwellings and sport fields or playgrounds.

In the wider surrounding area, a paint spraying works and a brick works were located at distances greater than approximately 300m to the north-west. The brick works and associated pit were subsequently redeveloped with residential dwellings. The paint spraying works subsequently became a warehouse.

No evidence of bomb damage during WWII is noted on the available historical map extracts.



## **7 STATUTORY DATABASE SEARCH**

### **7.1 General**

This section details any relevant information from registers maintained by the EA. Information provided by the BGS, The Coal Authority, Health Protection Agency and the National Environment Research Council (NERC) is also considered. The information held by the various bodies is summarised below and presented in detail in Appendix II.

It should be noted that the information provided in the desk study is obtained from independent third party sources. It is provided in good faith, but no guarantee can be provided as to its accuracy. Independent enquiries should be made relating to information provided in the desk study information that may impact on the proposed development. The desk study information is not necessarily exhaustive and further information relevant to the site may be available from other sources.

### **7.2 Database Search Results**

There are no registrations listed within 0.5km of the site under the following:

- Contaminated Land Register Entries and Notices;
- Prosecutions Relating to Controlled Waters;
- Enforcement and Prohibition Notices;
- Integrated Pollution Controls;
- Integrated Pollution Prevention and Controls;
- Local Authority Pollution Prevention and Control;
- Local Authority Pollution Prevention and Control Enforcements;
- Pollution Incidents to Controlled Waters;
- Prosecutions Relating to Authorised Processes;
- Registered Radioactive Substances;
- Water Industry Act Referrals;
- BGS Recorded Landfill Sites;
- Integrated Pollution Control Registered Waste Sites;
- Licenced Waste Management Facilities;
- Any Registered Landfill, Transfer, Treatment or Disposal Sites;
- Any Hazardous Substance Sites.

The following sections discuss the database search results which identified registrations listed within 0.5km of the site.

### **7.3 Environment Agency Search Results**

There is one Local Authority Pollution Prevention and Control located within 0.5km of the site. The listing relates to a dry cleaner located approximately 460m to the north-west.

There is one historical landfill located within 0.5km of the site. This listing relates to a facility that accepted wastes including inert wastes over an undefined period of time between approximately 470m to the north-west.

There is one area of potentially infilled land (non-water) located within 0.5km of the site. The listing relates to an area of unknown filled land (pit, quarry etc.) located approximately 450m to the north-west.



There is one area of potentially infilled land (water) located within 0.5km of the site. The listing relates to an area of unknown filled land (pond, marsh, river, stream etc.) located approximately 460m to the north-east.

Further details are presented in Appendix II.

#### **7.4 Geological Hazards**

There is either at very low risk or no hazard from collapsible ground stability, shrinking or swelling of the ground stability, compressible land stability, running sand ground stability ground dissolution, stability or landslide ground stability at the site.

The site is located in an area at 'inconclusive' risk from rock mining. There is one man made mining cavity located within 0.5km of the site. The listing relates to a vertical shaft with chambers at the base for the extraction of chalk.

There are no BGS recorded mineral sites located within 0.5km of the site.

The site is located in an area indicated to have a very significant soluble rock risk with a 'high possibility' of occurrence. However, the site is also indicated to be at very low risk from ground dissolution ground stability hazards. There are no recorded natural cavities in the vicinity of the site.

The environmental database search indicates the site is in a lower probability radon area and that new developments or extensions do not require radon protection measures.

The site is located in an area with a limited potential for groundwater flooding to occur.

The site is not indicated to be at risk from flooding from rivers and seas without defences.

The western half of the site and the central eastern portion of the site are indicated to be at risk from surface water flooding.

Further details are presented in Appendix II.

#### **7.5 Contemporary Trade References**

There are thirty-one contemporary trade references located within 0.5km of the site. The first listing relates to ready mix concrete and mortar located approximately 115m to the south-west. The second listing relates to blinds, awnings and canopies located approximately 145m to the north-west. The remaining listings relate to various land-uses including but not limited to sports equipment manufacture, air conditioning units, water softeners, hardware and vehicle repair, testing and servicing located at distances greater than approximately 175m from the site.

There are sixteen commercial services points of interest located within 0.5km of the site. The first listing relates to distribution and haulage services located approximately 115m to the south-west. The next two listings relate to vehicle repair, testing and servicing located approximately 260m to the south. The remaining listings relate to vehicle repair, testing and servicing, pest and vermin control and a scrap metal merchant located at distances greater than approximately 300m from the site.

There is one public infrastructure point of interest located within 0.5km of the site. The listing relates to waste storage, processing and disposal located approximately 440m to the west.



There are two recreational and environmental points of interest located within 0.5km of the site. The listings relate to a playground located directly to the south.

Further details are presented in Appendix II.



## **8 UNEXPLODED ORDNANCE**

A preliminary unexploded ordnance (UXO) desk study has identified the site to be located in an area at 'high risk' from the presence of UXO. The Unexploded Bomb Risk Map is presented in full in Appendix IV.

No evidence of bomb damage during WWII is noted on the available historical map extracts.

EOD Contracts Limited completed an Explosive Ordnance Desk Top Study (report reference EOD/21/21086/DTS/ASL Ascot Arms, Central Avenue, Gravesend, DA12 5AW, dated 26<sup>th</sup> February 2021) for the site on behalf of ASL.

Gravesend was identified as experiencing heavy bombardment throughout WW2. However, the exact location of the strikes could not be determined.

The findings of the Explosive Ordnance Desk Top Study indicate that there is a low risk in relation to the potential for UXO to be present at the site within the public house portion of the site. In the south and west of the site in the playing field portion of the site, a medium risk in relation to the potential for UXO to be present was identified.

For the low risk portion of the site, it is recommended UXO safety awareness training is provided to all site operatives by a competent person.

For the medium risk portion of the site, it is recommended that the potential risks from UXO at the site should be communicated to all stakeholders and the project planner so that appropriate health and safety precautions as set out in the Explosive Ordnance Desk Top Study report may be taken during the development. Further to this, UXO safety awareness training should be given to all site personnel involved with intrusive earthworks at the site as part of any future development works. Appropriate discovery strategy, emergency procedures and work permits should be in place as part of the development works. It is also recommended that all excavations at the site associated with the proposed development including investigation works are cleared and undertaken under the supervision of an appropriately qualified UXO contractor.

The Explosive Ordnance Desk Top Study is presented in full in Appendix IV.



## **9 ASSESSMENT OF POTENTIAL CONTAMINATION RISKS**

### **9.1 General**

The following sections identify potential sources of contamination at the site and the surrounding area. The receptors to any contamination are also identified together with the pathways by which the contamination may make contact with the receptors. This section of the report uses the guidance presented in CLR 11 'Model Procedures for the Management of Land Contamination' produced by DEFRA and the EA to develop a conceptual site model as a 'source-pathway-receptor' model in accordance with current best practice.

### **9.2 On-Site Sources of Contamination**

The potential sources of on-site contamination are associated with the site's former and current land uses. The site history dating back to 1869 has generally comprised undeveloped agricultural land and a public house since at least 1936. The public house has undergone a number of phases of minor development including an electrical substation that was constructed by at least 1986.

The former and current land-uses are not classified in the Department for Environment, Food and Rural Affairs and the Environment Agency's document CLR8 and the Department of the Environment Industry Profiles as being potential sources of contamination.

However, there is the potential for Made Ground to be present at the site associated with its development. Given the likely nature of the identified Made Ground that is expected to comprise relocated natural strata or natural strata including construction materials, the potential for significant contamination to be present is considered to be very low. Further to this, given the likely composition and thickness of these materials, the potential for significant ground gas production is considered to be very low if not negligible.

There is also the potential for contamination at the site from incidental leaks or spills of fuels and oils from machinery and vehicles used at the site. This would give rise to the presence of oil and fuel based hydrocarbons within the near surface soils. No visual or olfactory evidence of fuel or oil spillages was noted during the site walkover.

The electrical substation in the north-west of the site is considered to be a potential source of contamination in the form of oil and fuel based hydrocarbons and polychlorinated biphenyls.

The environmental database search indicates the site to be in an area where marginally elevated concentrations of lead up to 200mg/kg may be present associated with historical industrial activities completed within the vicinity of the site. Land to the north in the vicinity of the site is indicated to be characterised by lead concentrations up to approximately 300mg/kg.

Finally, there is the potential for asbestos to be present within the building fabric of the structures present at the site.

### **9.3 Off-Site Sources of Contamination**

The potential sources of off-site contamination are associated with the site's former and current land uses. The immediate surrounding area has generally comprised agricultural land, residential dwellings and sport fields or playgrounds. In the wider surrounding area, a paint spraying works and a brick works were located at distances greater than



approximately 300m to the north-west. The brick works and associated pit were subsequently redeveloped with residential dwellings. The paint spraying works subsequently became a warehouse. Finally, areas of filled land and historical landfill facilities have been identified in excess of approximately 450m from the site.

The former and current uses of the immediate surrounding area are not classified by the Department for Environment, Food and Rural Affairs and the Environment Agency's document CLR8 as being potential sources of contamination.

Potential sources of contamination have been identified in the wider surrounding area. Due to the distance to the identified potential sources of contamination completed in the wider surrounding area at distances in excess of approximately 250m from the site boundary, the potential risk posed at the site is considered to be very low if not negligible and will not be considered further.

The filled land and landfills in the wider surrounding area are considered to be potential sources of hazardous ground gas. However, due to the distance to these areas of filled land, the potential risk posed at the site is considered to be very low if not negligible.

#### **9.4 Receptors and Pathways**

The receptors to any potential contamination at the site and therefore the element actually at risk from contamination have been identified as the following:

- Construction and maintenance workers (R1);
- Current and future site users (R2);
- Service Lines – Constructed as part of any new development (R3);
- Groundwater hydraulically down gradient of the site –Principal Aquifer (R4);
- Surface watercourses – Unnamed stream 815m to the west (R5);
- Neighbouring properties and residents (R6).

A pathway is the means by which a contamination source makes contact with the receptor creating a pollutant linkage. The three elements of a pollutant linkage (source-pathway-receptor) need to be identified for there to be a perceived risk from identified contamination. The pathways considered in this assessment are as follows:

- Direct Physical Contact – Dermal contact, ingestion, inhalation (PL1);
- Migration from soils to groundwater via leaching (PL2);
- Migration within groundwater (PL3);
- Migration via service lines (PL4);
- Volatilisation of contaminants from soils and groundwater (PL5);
- Migration of hazardous ground gases (PL6).

The critical receptors are considered to be the Principal Aquifer (controlled waters) and a female adult (human health) for a commercial development.

#### **9.5 Potential Pollutant Linkages and Qualitative Risk Assessment**

The potential sources, pathways and receptors have been assessed to derive a list of potential pollutant linkages. This assessment is based on CLR 11 'Model Procedures for the Management of Land Contamination' (DEFRA) and in accordance with the procedure for identifying contaminated land under Part IIA of the Environmental Protection Act (1990). A generalised conceptual site model has been produced in this report as Figure 3.



## Human Health

The potential contamination risks to future site users and construction and maintenance workers are from the historical activities completed at the site and in the surrounding area.

The desk study has identified minor potential sources of contamination at the site including the potential for Made Ground to be present, the potential for elevated concentrations of lead and the potential for contamination to be present associated with an electrical substation located in the north-west of the site. The potential risk posed to human health is therefore considered to be typically low to very low and low to moderate in the vicinity of the electrical substation. It is considered that the risks are likely to be mitigated by the use of physical barriers including cover systems.

A minor potential source of hazardous ground gas has been identified at the site associated with the presence of Made Ground. The potential risk from hazardous ground gas is therefore considered to be low. It is considered likely that the risk may be mitigated by the use of physical barriers comprising gas and potentially hydrocarbon resistant membranes should contamination be present associated with the electrical substation.

There is the potential for asbestos to be present within the existing building fabric of the structures present at the site that may pose a risk to human health during the site clearance works. It is recommended that an asbestos survey is completed ahead of the demolition and site clearance works. If asbestos is identified, these materials should be removed by a suitably licensed contractor ahead of the demolition and site clearance works.

The desk study has not identified significant potential sources of contamination or hazardous ground gas in the surrounding area that are anticipated to significantly impact on the site. The potential risk at the site from off-site sources of contamination is therefore considered to be very low if not negligible.

The potential contamination risks to neighbouring site users are from historical activities completed at the site. The desk study has not identified any significant potential sources of contamination at the site. The potential risk posed to neighbouring site users from any residual contamination at this site is therefore considered to be very low to negligible.

## Service Lines

Minor potential sources of contamination have been identified at the site by the desk study and therefore the potential risk to service lines is considered to be low. It is considered likely that the use of contaminant resistant water supply pipes will mitigate any potential residual risk to service lines.

## Groundwater

The chalk stratum is classified by the EA as a Principal Aquifer. There are four abstractions from groundwater located within 1.0km of the site. The first listing relates to the abstraction of groundwater for industrial processing located approximately 445m to the east. The second listing relates to the abstraction of groundwater for spray irrigation located approximately 755m to the south-west. The remaining listings relate to the abstraction of groundwater for potable supply located approximately 765m and 840m to the north. The site is located in a SPZ II and an SPZ III. A boundary with a SPZ I is located approximately 265m to the north.

Due to the lack of significant potential sources of contamination identified at the site, it is considered that the potential risk posed by contamination from the site is low.



### **Surface Watercourses**

The nearest surface water feature is an unnamed stream located approximately 815m to the west. Due to the lack of significant potential sources of contamination identified at the site and the distance to the nearest surface water feature, the potential risk posed by contamination from the site is considered to be negligible.



## 10.0 GEOTECHNICAL CONSIDERATIONS

The published geology provided by the BGS indicates the site to be directly underlain by solid geology of the Lewes Nodular Chalk Formation, Seaford Chalk Formation and Newhaven Chalk Formation (Undifferentiated). In addition to the published geology, it is expected that Made Ground and/or Topsoil will be present at the surface of beneath hardstandings given the current use of the site.

It is understood that the proposed development comprises the demolition of the existing structures and redevelopment to provide a new 62 bedroom care home (Use Class C2) together with associated access, car and cycle parking, structural landscaping, and amenity space provision. A proposed development layout is presented as Appendix I.

The site is currently occupied by a public house. It is understood that the public house includes a basement structure. The nature and extent of the basement structure is not known. It is recommended that the basement is removed as part of the demolition and site clearance. It is recommended that the resultant excavation is backfilled with materials that are geotechnically suitable for the development proposals.

Based on the expected geology, it is considered that conventional strip or pad foundations may be appropriate for lightly loaded structures at the proposed development. Foundations may need to be extended through any deeper Made Ground, soft, loose or otherwise unsuitable materials. It is noted that deeper Made Ground is anticipated associated with the basement structure currently present at the site.

For higher structural loads, if significant thicknesses of Made Ground are found to be present at the site or if the shallow ground conditions are found to be poor in nature, consideration to an alternative foundation solution such as piling may be required.

The site is located in an area at 'inconclusive' risk from rock mining. The closest man-made cavity to the site relates to a vertical shaft with chambers at the base for the extraction of chalk located approximately 270m to the south. There are no BGS recorded mineral sites located within 0.5km of the site. Due to the distance to the nearest mine entry, further consideration of the potential risk from rock mining at the site is not considered necessary.

The site is located in an area indicated to have a very significant soluble rock risk with a 'high possibility' of occurrence. However, the environmental database also indicates the site to be in an area at very low risk from dissolution of the ground stability hazards and there are no recorded natural cavities in the vicinity of the site. Based on the findings of the desk study, the potential risk from ground dissolution at the site is considered to be very low.

Based on the anticipated nature of the ground conditions, the use of shallow soakaways or other infiltration drainage systems may be feasible at the site. Soakaways should be appropriately located away from proposed or existing structures in accordance with CIRIA C574 'Engineering in Chalk'.

The site is locally indicated to be at risk from surface water flooding. Surface water flooding happens when rainwater does not drain away through the normal drainage systems or soak into the ground, but instead lies on or flows over the ground surface. The risk posed by surface water flooding at the site could be mitigated by the inclusion of appropriate surface water drainage systems within the proposed development.



It is considered necessary to undertake a detailed intrusive investigation at the site to identify any potential geotechnical constraints which may exist and to determine the geotechnical parameters of the underlying ground conditions.



## 11.0 FURTHER WORK

Based on the findings of the desk study it is recommended that an intrusive investigation is completed before commencement of any development works to assess the actual contaminative status of the ground at the site.

It is also considered essential that the intrusive investigation should determine the geotechnical parameters of the underlying ground conditions as part of the future development of the site.

The intrusive investigation is likely to comprise a series of boreholes and should include the installation of gas monitoring standpipes. Selected soil and leachate samples recovered during the intrusive investigation would be tested for a general suite of determinants.

The findings of the Explosive Ordnance Desk Top Study indicate that there is a low and medium risk in relation to the potential for UXO to be present at the site. Specific precautions are therefore required during the investigation and development of the site.

It is recommended that an asbestos survey is completed ahead of the demolition and site clearance works. If asbestos is identified, these materials should be removed by a suitably licensed contractor ahead of the demolition and site clearance works.



## 12.0 SUMMARY AND RECOMMENDATIONS

A desk study is required as part of the proposed development of the site for a care home with associated areas of hardstanding for access and parking and managed soft landscaping. The conclusions of this assessment are summarised as follows:

Based on the qualitative risk assessment the critical receptors are considered to be human health (female adult for a commercial development) and the controlled water (Principal Aquifer).

Based on the likely presence of contamination, the potential risk to human health is typically considered to be low to very low and locally low to moderate. The potential risk from hazardous ground gas and to groundwater and service lines is considered to be low. The potential risk to surface water is considered to be negligible. It is considered likely that the risks identified associated with contamination and hazardous ground gas may be mitigated by physical barriers including cover systems, gas and potentially hydrocarbon resistant membranes and contaminant resistant water supply pipes.

It is recommended that an asbestos survey is completed on the existing structures ahead of the demolition and site clearance works. If asbestos is identified, these materials should be removed by a suitably licensed contractor.

The findings of the Explosive Ordnance Desk Top Study indicate that there is a low to medium risk in relation to the potential for UXO to be present at the site. Specific precautions are therefore required during the investigation and development of the site. It is recommended that the existing basement is removed, and the resultant excavation is backfilled with materials that are geotechnically suitable for the development proposals.

It is considered that conventional strip or pad foundations may be appropriate for lightly loaded structures at the proposed development. Foundations should be extended through unsuitable materials. It is noted that deeper Made Ground is anticipated associated with the basement structure currently present at the site.

For higher structural loads, if significant thicknesses of Made Ground are found to be present or if the shallow ground conditions are found to be poor in nature, consideration to an alternative foundation solution such as piling may be required.

Based on the findings of the desk study, further consideration of the potential risk from rock mining at the site is not considered necessary.

Based on the findings of the desk study, the potential risk from ground dissolution at the site is considered to be very low.

The use of shallow soakaways or other infiltration drainage systems may be feasible at the site. Soakaways should be appropriately located away from proposed or existing structures in accordance with CIRIA C574 'Engineering in Chalk'.

The site is locally indicated to be at risk from surface water flooding. Surface water flooding happens when rainwater does not drain away through the normal drainage systems or soak into the ground, but instead lies on or flows over the ground surface. The risk posed by surface water flooding at the site could be mitigated by the inclusion of appropriate surface water drainage systems within the proposed development.

It is recommended that an intrusive ground investigation is required ahead of any development works to determine the founding properties of the underlying ground



conditions and to determine the actual contaminative ground conditions. The intrusive investigation should include an assessment of hazardous ground gas.



## REFERENCES

BGS Map Sheet No. 271 – Dartford , Solid and Drift. 1:50 000 scale

DEFRA R&D Publication CLR 7 “Assessment of Risks to Human Health from Land Contamination” dated March 2002.

DEFRA R&D Publication CLR 8 “Potential Contaminants for the Assessment of Land” dated March 2002.

DEFRA R&D Publication CLR 9 “Contaminants in Soil” dated March 2002.

DEFRA R&D Publication CLR 10 “The Contaminated Land Exposure Assessment (CLEA) Model” dated March 2002.

DEFRA R&D Publication CLR 11 “Model Procedures for the Management of Land Contamination” dated September 2004.

DEFRA R&D Publication CLR 12 “A Quality Approach for Contaminated Land Consultancy” dated 1997.

[www.environment-agency.gov.uk](http://www.environment-agency.gov.uk)

Department of the Environment Industry Profiles

Envirocheck Report No. 272544619\_1\_1

EOD Contracts Limited, Explosive Ordnance Desk Top Study, report reference EOD/21/21086/DTS/ASL Ascot Arms, Central Avenue, Gravesend, DA12 5AW, dated 26th February 2021



## GENERAL NOTES

The interpretation made in this report is based on the information obtained during the course of the desk study and ground investigation. It should be appreciated that any desk study information is not necessarily exhaustive and that further information relevant to the site and its proposed usage may be available. There may be conditions present on the site that have not been revealed by the ground investigation which as a result have not been addressed within this report.

The accuracy of any map extracts cannot be guaranteed and it should be recognised that different conditions on site may have existed between and subsequent to the various map surveys.

The qualitative assessment of risk presented in this report presents an assessment of potential pollutant linkages between sources, pathways and receptors. A level of risk is attributed to these linkages. However a low or insignificant risk does not imply that elevated concentrations of various determinants are not present on the site when compared to background or 'greenfield' conditions.

The level of risk attributed is based on a number of factors and the interpretation of this risk may be applied in a different manner for a different end use or environmental setting. The presence of contaminants may be assessed in alternative ways by institutional bodies regardless of whether an apparent risk is present based on the identified pollutant linkages in this assessment.

This report may express an opinion on possible configurations of strata underlying the site between or beyond the exploratory holes or on the possible presence of features based on either visual, verbal or published evidence, this is for guidance only and no liability can be accepted for its accuracy.

Comments made on ground conditions are based on the observations made at the time of the investigation works. It should be noted that groundwater levels may vary due to seasonal fluctuation or other factors. Observations made with respect to below ground gas concentrations may also vary due to seasonal factors and atmospheric conditions.

This report has been prepared in relation to the proposed development as detailed herein. Should the nature of the development change following the submission of this report a re-assessment of the conditions recorded on the site may be necessary.

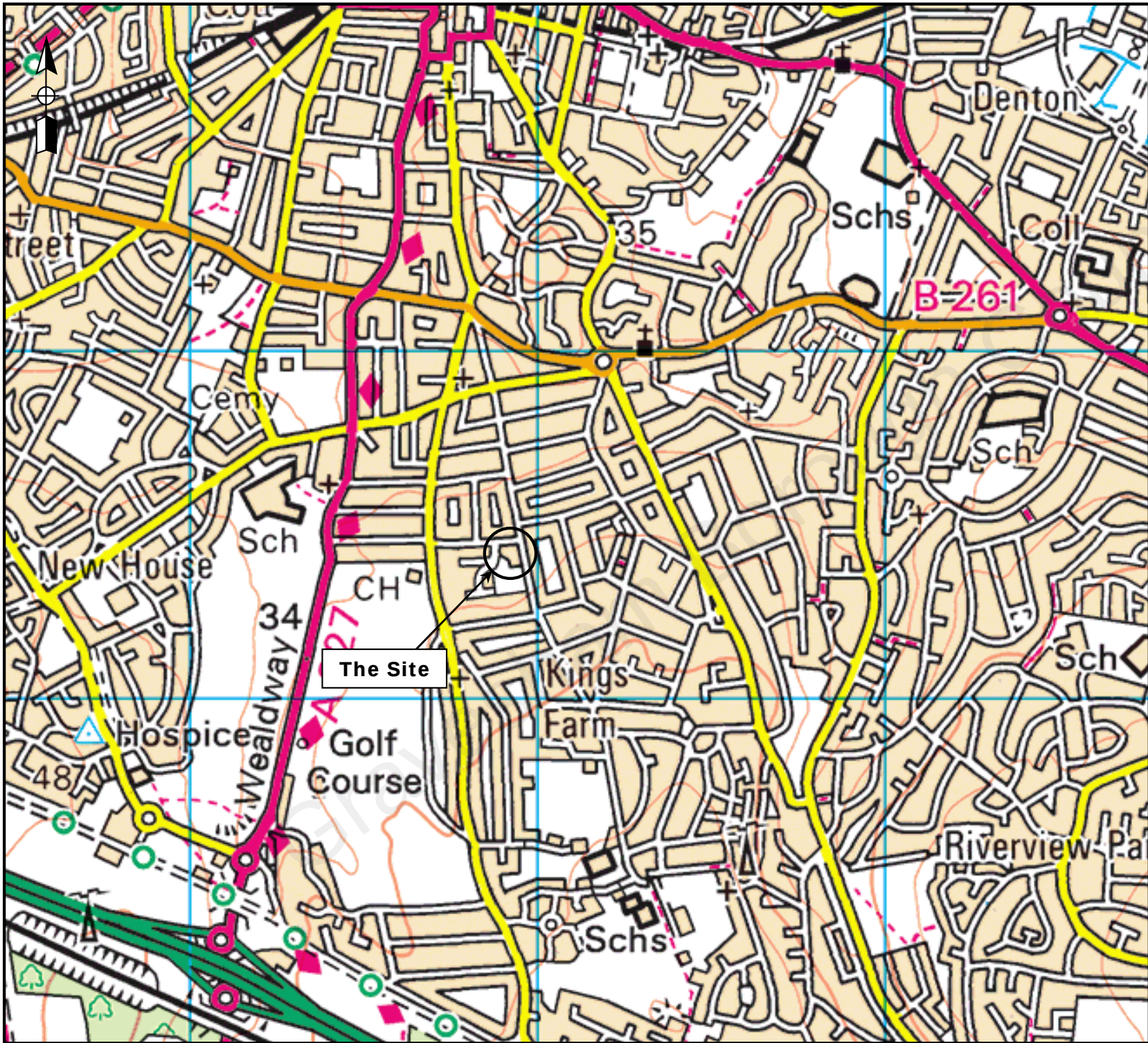
This report may not be used in the assessment of the conditions at any site other than the site described herein

This report has been prepared for the sole use of the client and the client's agents and advisors in relation to the proposed development as detailed herein. The issue of this report to third parties not involved in the proposed development as described herein is not permitted without the prior permission being received in writing by ASL. Reproduction of this report to include all figures, drawings and appendices is prohibited without the prior written consent of ASL.



## FIGURES

Gravesham Borough Council



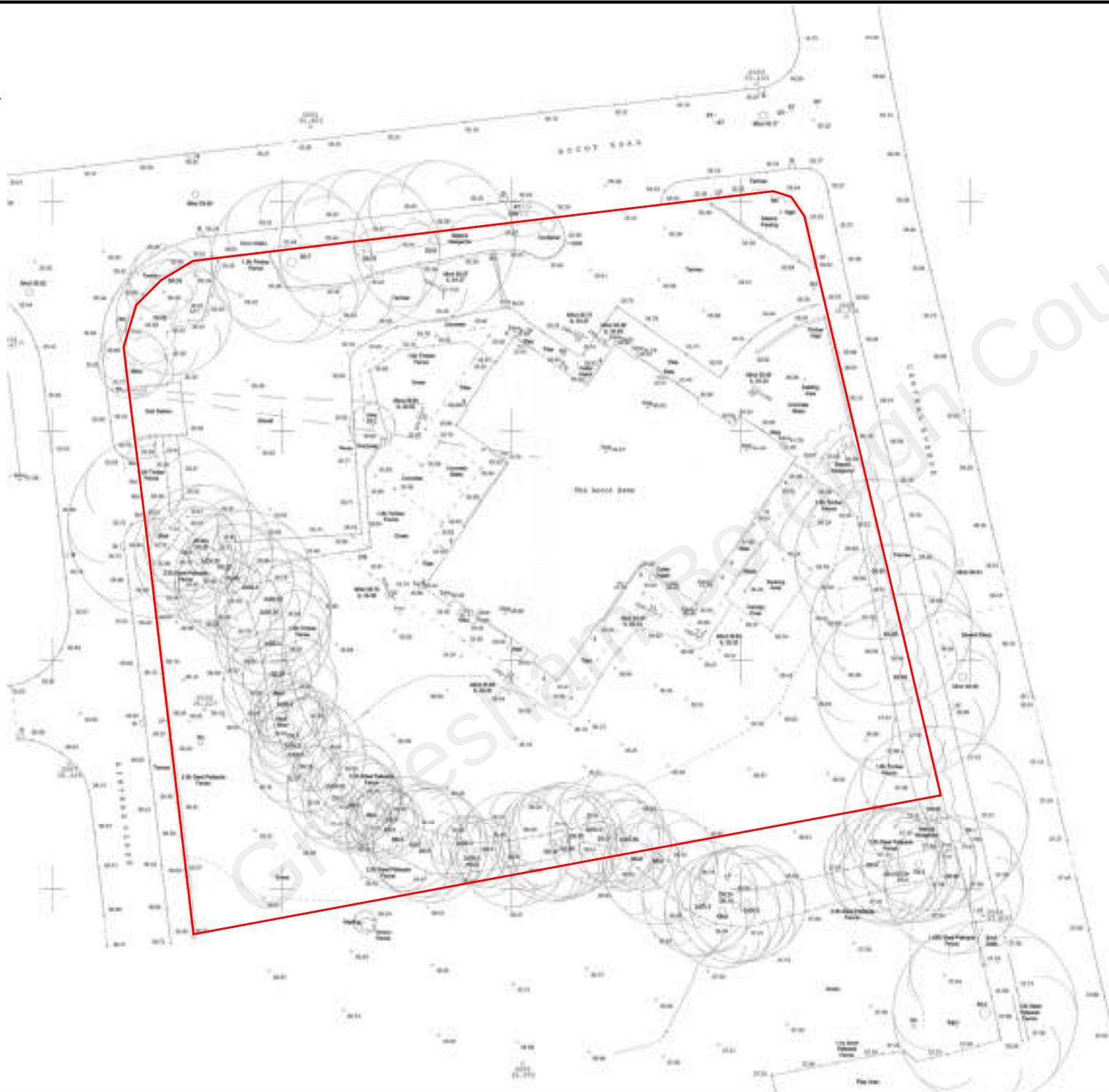
Reproduced under licence to ASL. Licence No. 100044800  
OS Map Sheet No. 178 Map of Thames Estuary, Rochester & Southend-on-Sea, 1:50,000 Scale, dated 2016

|              |                                   |
|--------------|-----------------------------------|
| Drawing No.  | Figure 1                          |
| Drawing Name | Site Layout Plan                  |
| Project      | Land at Central Avenue, Gravesend |
| Client Name  | Avery Healthcare Group            |
| Project No.  | 002-21-719                        |

ASL  
Holly Farm Business Park  
Honiley  
Warwickshire  
CV8 1NP

T: +44 (0)1926 485 508  
E: info@aslenvironmental.co.uk  
W: www.aslenvironmental.co.uk

asl



### Key

— Site Boundary

### Notes:

Not to Scale  
This drawing should be read in conjunction with the associated ASL report.  
All dimensions to be checked on site and not scaled on this drawing.

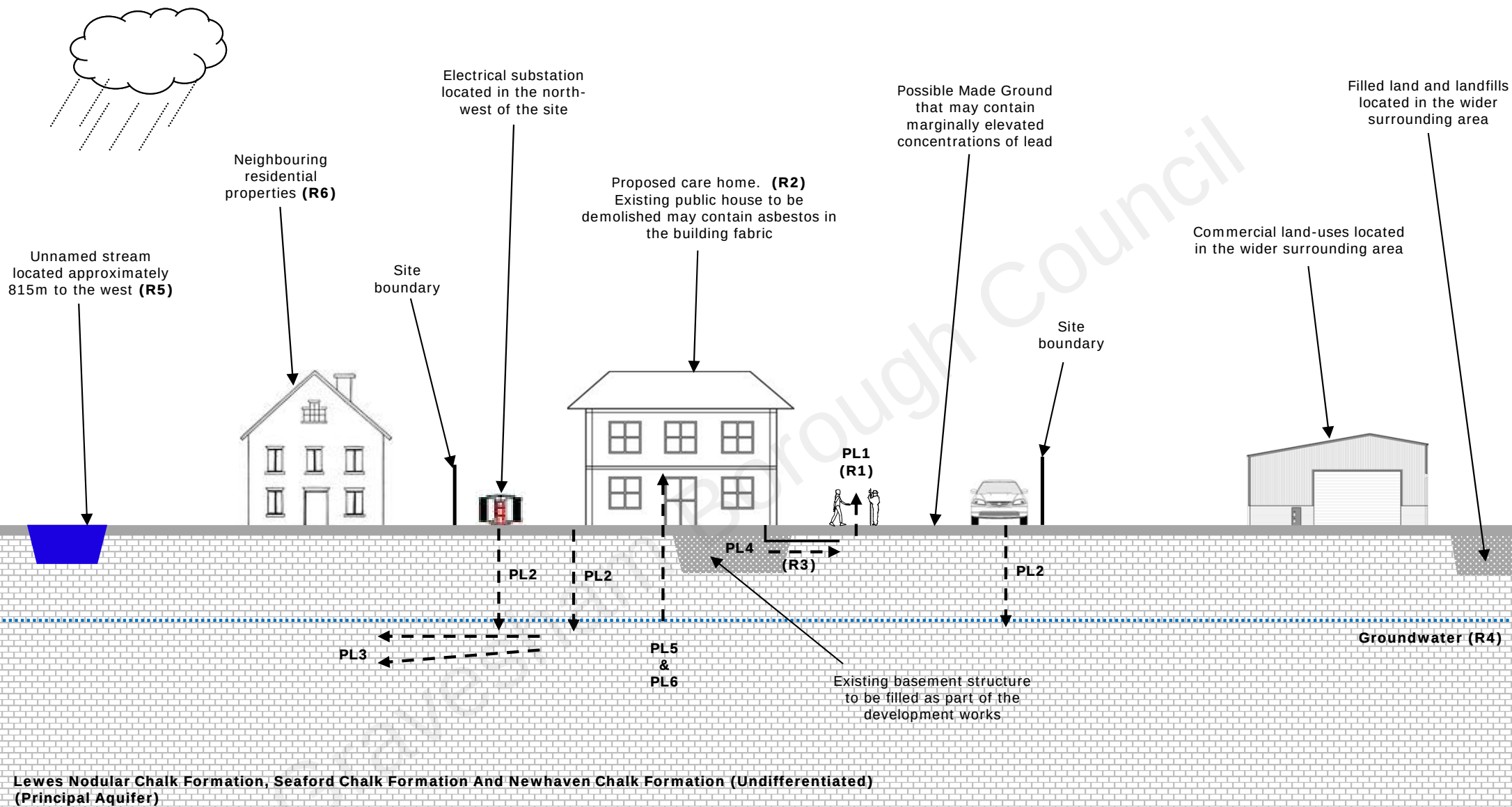
|              |                                          |
|--------------|------------------------------------------|
| Drawing No.  | <b>Figure 2</b>                          |
| Drawing Name | <b>Site Layout Plan</b>                  |
| Project      | <b>Land at Central Avenue, Gravesend</b> |
| Client Name  | <b>Avery Healthcare Group</b>            |
| Project No.  | <b>002-21-719</b>                        |

### ASL

Holly Farm Business Park  
Honiley  
Warwickshire  
CV8 1NP

T: +44 (0)1926 485 508  
E: [info@aslenvironmental.co.uk](mailto:info@aslenvironmental.co.uk)  
W: [www.aslenvironmental.co.uk](http://www.aslenvironmental.co.uk)



Drawing No. **Figure 3**Drawing Name **Conceptual Site Model**Project Name **Land at Central Avenue, Gravesend**Client Name **Avery Healthcare Group**Project No. **002-21-719****Summary of Pollutant Linkages** (for full details see contamination associated report)**Receptors:**

R1 - Construction and maintenance workers;  
R2 - Current and future site users;  
R3 - Service Lines;  
R4 - Groundwater;  
R5 - Surface watercourses;  
R6 - Neighbouring properties and residents.

**Pathways:**

PL1 - Direct Physical Contact;  
PL2 - Migration from soils to groundwater via leaching;  
PL3 - Migration within groundwater;  
PL4 - Migration via service lines;  
PL5 - Volatilisation of contaminants from soils and groundwater;  
PL6 - Migration of hazardous ground gas.

**ASL**

Holly Farm Business Park  
Honiley  
Warwickshire  
CV8 1NP

T: +44 (0)1926 485 508  
E: info@aslenvironmental.co.uk  
W: www.aslenvironmental.co.uk

**asl**



## **APPENDIX I**

### **PROPOSED DEVELOPMENT LAYOUT**

Gravesham Borough Council



WATER CLOSE

Notes

Do not scale, use figured dimensions only.

All dimensions to be verified on site prior to the commencement of any work or the production of any shop drawing. All discrepancies to be reported to the Architect.

This drawing is to be read in conjunction with all related Architect's and Engineer's drawings and any other relevant information.

This drawing is copyright © of TDC Architects Ltd.

| REV | DATE | REVISION | INITIALS | CHECK |
|-----|------|----------|----------|-------|
|     |      |          |          |       |
|     |      |          |          |       |
|     |      |          |          |       |
|     |      |          |          |       |

DRAWING STATUS

|                  |                                     |
|------------------|-------------------------------------|
| AS-RECORDED      | <input type="checkbox"/>            |
| AS-BUILT         | <input type="checkbox"/>            |
| FOR CONSTRUCTION | <input type="checkbox"/>            |
| FOR COORDINATION | <input type="checkbox"/>            |
| FOR PLANNING     | <input checked="" type="checkbox"/> |
| FOR DISCUSSION   | <input type="checkbox"/>            |

**TDC ARCH DESIGN**  
The Design Collective Architects

2nd Fl. | 1-13 Museum St.  
York | YO1 7JH  
info@tdc-arch.design

www.tdc-arch.design

Client

**Avery**

Project

Proposed Care Home,  
Central Avenue, Gravesend

Drawing Title

Proposed Site Plan

|          |            |            |          |
|----------|------------|------------|----------|
| Scale    | 1:200 @ A1 | Date       | Dec 2020 |
| Drawn by | GF         | Checked by | SEL      |

|         |          |             |          |      |   |
|---------|----------|-------------|----------|------|---|
| Job No. | AL202043 | Drawing No. | AL(9)901 | Rev. | - |
|---------|----------|-------------|----------|------|---|



## **APPENDIX II**

### **ENVIRONMENTAL DATABASE SEARCH RESULTS**

Gravesham Borough Council

## Envirocheck<sup>®</sup> Report:

### Datasheet

#### Order Details:

**Order Number:**

272544619\_1\_1

**Customer Reference:**

002-21-719

**National Grid Reference:**

564920, 172400

**Slice:**

A

**Site Area (Ha):**

0.4

**Search Buffer (m):**

1000

#### Site Details:

Land at Central Avenue

GRAVESEND

DA12 5AW

#### Client Details:

Mr M Davis

ASL

Holly Farm Business Park

Honiley

Warwickshire

CV8 1NP

| Report Section        | Page Number |
|-----------------------|-------------|
| Summary               | -           |
| Agency & Hydrological | 1           |
| Waste                 | 5           |
| Hazardous Substances  | -           |
| Geological            | 6           |
| Industrial Land Use   | 11          |
| Sensitive Land Use    | -           |
| Data Currency         | 20          |
| Data Suppliers        | 26          |
| Useful Contacts       | 27          |

## 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.

## Copyright Notice

© Landmark Information Group Limited 2021. The Copyright on the information and data and its format as contained in this Envirocheck® Report ("Report") is the property of Landmark Information Group Limited ("Landmark") and several other Data Providers, including (but not limited to) Ordnance Survey, British Geological Survey, the Environment Agency/Natural Resources Wales and Natural England, and must not be reproduced in whole or in part by photocopying or any other method. The Report is supplied under Landmark's Terms and Conditions accepted by the Customer. A copy of Landmark's Terms and Conditions can be found with the Index Map for this report. Additional copies of the Report may be obtained from Landmark, subject to Landmark's charges in force from time to time. The Copyright, design rights and any other intellectual rights shall remain the exclusive property of Landmark and /or other Data providers, whose Copyright material has been included in this Report. © Environment Agency & United Kingdom Research and Innovation 2021. © Natural Resources Wales & United Kingdom Research and Innovation 2021.

## Natural England Copyright Notice

Site of Special Scientific Interest, National Nature Reserve, Ramsar, Special Protection Area, Special Conservation Area, Marine Nature Reserve data (derived from Ordnance Survey 1:10000 raster) is provided by, and used with the permission of, Natural England who retain the copyright and Intellectual Property Rights for the data.

## Scottish Natural Heritage Copyright

Contains SNH information licensed under the Open Government Licence v3.0.

## Ove Arup Copyright Notice

The Mining Instability data was obtained on licence from Ove Arup & Partners Limited (for further information, contact [mining.review@arup.com](mailto:mining.review@arup.com)). No reproduction or further use of such Data is to be made without the prior written consent of Ove Arup & Partners Limited. The supplied Mining Instability data is derived from publicly available records and other third party sources and neither Ove Arup & Partners nor Landmark warrant the accuracy or completeness of such information or data.

## Stantec Copyright Notice

The cavity data presented has been extracted from the PBA (now Stantec UK Ltd) enhanced version of the original DEFRA national cavity databases. Stantec UK Ltd retain the copyright & intellectual property rights in the data. Whilst all reasonable efforts are made to check that the information contained in the cavity databases is accurate we do not warrant that the data is complete or error free. The information is based upon our own researches and those collated from a number of external sources and is continually being augmented and updated by Stantec UK Ltd. In no event shall Stantec UK Ltd or Landmark be liable for any loss or damage including, without limitation, indirect or consequential loss or damage arising from the use of this data.

## Radon Potential dataset Copyright Notice

Information supplied from a joint dataset compiled by The British Geological Survey and Public Health England.

## Natural Resources Wales Copyright Notice

Contains Natural Resources Wales information © Natural Resources Wales and Database Right. All rights Reserved. Contains Ordnance Survey Data. Ordnance Survey Licence number 100019741. Crown Copyright and Database Right. Contains Natural Resources Wales information © Natural Resources Wales and Database Right. All rights Reserved. Some features of this information are based on digital spatial data licensed from the Centre for Ecology & Hydrology © NERC (CEH). Defra, Met Office and DARD Rivers Agency © Crown copyright. © Cranfield University. © James Hutton Institute. Contains OS data © Crown copyright and database right 2021. Land & Property Services © Crown copyright and database right.

## Report Version v53.0

| Data Type                                                     | Page Number | On Site | 0 to 250m | 251 to 500m | 501 to 1000m (*up to 2000m) |
|---------------------------------------------------------------|-------------|---------|-----------|-------------|-----------------------------|
| <b>Agency &amp; Hydrological</b>                              |             |         |           |             |                             |
| BGS Groundwater Flooding Susceptibility                       | pg 1        | Yes     | Yes       |             | n/a                         |
| Contaminated Land Register Entries and Notices                |             |         |           |             |                             |
| Discharge Consents                                            | pg 1        |         | 1         | 2           |                             |
| Prosecutions Relating to Controlled Waters                    |             |         | n/a       | n/a         | n/a                         |
| 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             | pg 1        |         |           | 1           | 1                           |
| Local Authority Pollution Prevention and Control Enforcements |             |         |           |             |                             |
| Nearest Surface Water Feature                                 | pg 2        |         |           |             | Yes                         |
| Pollution Incidents to Controlled Waters                      |             |         |           |             |                             |
| Prosecutions Relating to Authorised Processes                 |             |         |           |             |                             |
| Registered Radioactive Substances                             |             |         |           |             |                             |
| River Quality                                                 |             |         |           |             |                             |
| River Quality Biology Sampling Points                         |             |         |           |             |                             |
| River Quality Chemistry Sampling Points                       |             |         |           |             |                             |
| Substantiated Pollution Incident Register                     | pg 2        |         |           |             | 1                           |
| Water Abstractions                                            | pg 2        |         |           | 1           | 4 (*1)                      |
| Water Industry Act Referrals                                  |             |         |           |             |                             |
| Groundwater Vulnerability Map                                 | pg 3        | Yes     | n/a       | n/a         | n/a                         |
| Groundwater Vulnerability - Soluble Rock Risk                 | pg 3        | 1       | n/a       | n/a         | n/a                         |
| Groundwater Vulnerability - Local Information                 |             |         | n/a       | n/a         | n/a                         |
| Bedrock Aquifer Designations                                  | pg 3        | Yes     | n/a       | n/a         | n/a                         |
| Superficial Aquifer Designations                              |             |         | n/a       | n/a         | n/a                         |
| Source Protection Zones                                       | pg 3        | 2       |           | 1           | 1                           |
| 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                                        | pg 4        |         |           |             | 1                           |

| Data Type                                                           | Page Number | On Site | 0 to 250m | 251 to 500m | 501 to 1000m<br>(*up to 2000m) |
|---------------------------------------------------------------------|-------------|---------|-----------|-------------|--------------------------------|
| <b>Waste</b>                                                        |             |         |           |             |                                |
| BGS Recorded Landfill Sites                                         |             |         |           |             |                                |
| Historical Landfill Sites                                           | pg 5        |         |           | 1           | 1                              |
| Integrated Pollution Control Registered Waste Sites                 |             |         |           |             |                                |
| Licensed Waste Management Facilities (Landfill Boundaries)          |             |         |           |             |                                |
| Licensed Waste Management Facilities (Locations)                    |             |         |           |             |                                |
| Local Authority Landfill Coverage                                   | pg 5        | 2       | n/a       | n/a         | n/a                            |
| Local Authority Recorded Landfill Sites                             |             |         |           |             |                                |
| Potentially Infilled Land (Non-Water)                               | pg 5        |         |           | 1           | 1                              |
| Potentially Infilled Land (Water)                                   | pg 5        |         |           | 1           | 2                              |
| Registered Landfill Sites                                           |             |         |           |             |                                |
| Registered Waste Transfer Sites                                     |             |         |           |             |                                |
| Registered Waste Treatment or Disposal Sites                        |             |         |           |             |                                |
| <b>Hazardous Substances</b>                                         |             |         |           |             |                                |
| 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) |
|-------------------------------------------------------------------|-------------|---------|-----------|-------------|-----------------------------|
| <b>Geological</b>                                                 |             |         |           |             |                             |
| BGS 1:625,000 Solid Geology                                       | pg 6        | Yes     | n/a       | n/a         | n/a                         |
| BGS Estimated Soil Chemistry                                      | pg 6        | Yes     | Yes       |             | Yes                         |
| BGS Recorded Mineral Sites                                        | pg 7        |         |           |             | 8                           |
| 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                                                | pg 8        | Yes     | n/a       | n/a         | n/a                         |
| Man-Made Mining Cavities                                          | pg 9        |         |           | 1           | 5                           |
| Natural Cavities                                                  |             |         |           |             |                             |
| Non Coal Mining Areas of Great Britain                            | pg 9        | Yes     | Yes       | n/a         | n/a                         |
| Potential for Collapsible Ground Stability Hazards                | pg 10       | Yes     | Yes       | n/a         | n/a                         |
| Potential for Compressible Ground Stability Hazards               |             |         |           | n/a         | n/a                         |
| Potential for Ground Dissolution Stability Hazards                | pg 10       | Yes     | Yes       | n/a         | n/a                         |
| Potential for Landslide Ground Stability Hazards                  |             |         |           | n/a         | n/a                         |
| Potential for Running Sand Ground Stability Hazards               |             |         |           | n/a         | n/a                         |
| Potential for Shrinking or Swelling Clay Ground Stability Hazards |             |         |           | n/a         | n/a                         |
| Radon Potential - Radon Affected Areas                            |             |         | n/a       | n/a         | n/a                         |
| Radon Potential - Radon Protection Measures                       |             |         | n/a       | n/a         | n/a                         |
| <b>Industrial Land Use</b>                                        |             |         |           |             |                             |
| Contemporary Trade Directory Entries                              | pg 11       |         | 4         | 27          | 34                          |
| Fuel Station Entries                                              | pg 16       |         |           |             | 1                           |
| Points of Interest - Commercial Services                          | pg 16       |         | 1         | 15          | 9                           |
| Points of Interest - Education and Health                         |             |         |           |             |                             |
| Points of Interest - Manufacturing and Production                 | pg 18       |         |           |             | 1                           |
| Points of Interest - Public Infrastructure                        | pg 18       |         |           | 1           | 3                           |
| Points of Interest - Recreational and Environmental               | pg 19       |         | 2         |             | 8                           |
| Gas Pipelines                                                     |             |         |           |             |                             |
| Underground Electrical Cables                                     |             |         |           |             |                             |

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

| Map ID | Details                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR           |
|--------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|------------------------------|---------|---------------|
|        | <b>BGS Groundwater Flooding Susceptibility</b><br>Flooding Type: Limited Potential for Groundwater Flooding to Occur                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | A13SW (NW)                             | 0                            | 1       | 564920 172404 |
|        | <b>BGS Groundwater Flooding Susceptibility</b><br>Flooding Type: Limited Potential for Groundwater Flooding to Occur                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | A13SE (E)                              | 42                           | 1       | 565000 172404 |
| 1      | <b>Discharge Consents</b><br>Operator: R.Blowers Esq.<br>Property Type: DOMESTIC PROPERTY (SINGLE) (INCL FARM HOUSE)<br>Location: 34 Kitchener Avenue, Gravesend Kent<br>Authority: Environment Agency, Southern Region<br>Catchment Area: Not Given<br>Reference: P01013<br>Permit Version: 1<br>Effective Date: 8th June 1987<br>Issued Date: 8th June 1987<br>Revocation Date: Not Supplied<br>Discharge Type: Sewage Discharges - Final/Treated Effluent - Not Water Company<br>Discharge: Land/Soakaway<br>Environment:<br>Receiving Water: Into Land<br><b>Status:</b> Pre National Rivers Authority Legislation where issue date < 01/09/1989<br>Positional Accuracy: Located by supplier to within 100m | A13SE (E)                              | 193                          | 2       | 565140 172320 |
| 2      | <b>Discharge Consents</b><br>Operator: Southern Water Services Ltd.<br>Property Type: STORM TANK/CSO ON SEWERAGE NETWORK (WATER COMPANY)<br>Location: Cross Lane West Gravesend Cso Cross Lane Gravesend Kent Da11 7py<br>Authority: Environment Agency, Thames Region<br>Catchment Area: Not Supplied<br>Reference: Casm.0005<br>Permit Version: 3<br>Effective Date: 27th February 2017<br>Issued Date: 27th February 2017<br>Revocation Date: 30th March 2017<br>Discharge Type: Public Sewage: Storm Sewage Overflow<br>Discharge: Saline Estuary<br>Environment:<br>Receiving Water: Tidal River Thames<br><b>Status:</b> Varied under EPR 2010<br>Positional Accuracy: Located by supplier to within 10m  | A18SW (NW)                             | 466                          | 2       | 564590 172790 |
| 2      | <b>Discharge Consents</b><br>Operator: Southern Water Services Ltd.<br>Property Type: STORM TANK/CSO ON SEWERAGE NETWORK (WATER COMPANY)<br>Location: Cross Lane West Gravesend Cso Cross Lane Gravesend Kent Da11 7py<br>Authority: Environment Agency, Thames Region<br>Catchment Area: Not Supplied<br>Reference: Casm.0005<br>Permit Version: 4<br>Effective Date: 31st March 2017<br>Issued Date: 27th February 2017<br>Revocation Date: Not Supplied<br>Discharge Type: Public Sewage: Storm Sewage Overflow<br>Discharge: Saline Estuary<br>Environment:<br>Receiving Water: Tidal River Thames<br><b>Status:</b> Varied under EPR 2010<br>Positional Accuracy: Located by supplier to within 10m        | A18SW (NW)                             | 466                          | 2       | 564590 172790 |
| 3      | <b>Local Authority Pollution Prevention and Controls</b><br>Name: Hrk Cleaners<br>Location: 7 Cross Lane West, Gravesend, Da11 7pz<br>Authority: Gravesham Borough Council, Environmental Health Department<br>Permit Reference: PP6/06/61<br>Dated: 31st October 2006<br>Process Type: Local Authority Pollution Prevention and Control<br>Description: PG6/46 Dry cleaning<br><b>Status:</b> Authorisation certificate surrendered by operator<br>Positional Accuracy: Manually positioned to the address or location                                                                                                                                                                                         | A18SW (NW)                             | 458                          | 3       | 564668 172834 |
| 4      | <b>Local Authority Pollution Prevention and Controls</b><br>Name: Valley Dry Cleaners<br>Location: 8 The Parade, Valley Drive, Gravesend, Da12 5rt<br>Authority: Gravesham Borough Council, Environmental Health Department<br>Permit Reference: PP6/06/62<br>Dated: 31st October 2006<br>Process Type: Local Authority Pollution Prevention and Control<br>Description: PG6/46 Dry cleaning<br><b>Status:</b> Permitted<br>Positional Accuracy: Manually positioned to the address or location                                                                                                                                                                                                                 | A14NE (E)                              | 984                          | 3       | 565909 172638 |

| Map ID | Details                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR           |
|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|------------------------------|---------|---------------|
|        | <b>Nearest Surface Water Feature</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | A12NW (W)                              | 816                          | -       | 564071 172408 |
| 5      | <b>Substantiated Pollution Incident Register</b><br>Authority: Environment Agency - South East Region, Kent & South London Area<br>Incident Date: 13th March 2006<br>Incident Reference: 383446<br>Water Impact: Category 2 - Significant Incident<br>Air Impact: Category 4 - No Impact<br>Land Impact: Category 4 - No Impact<br>Positional Accuracy: Located by supplier to within 10m<br>Pollutant: Organic Chemicals : Solvent Based                                                                                                                                                                                                                                                      | A18NE (N)                              | 787                          | 2       | 565050 173220 |
| 6      | <b>Water Abstractions</b><br>Operator: Shaws Laundries Limited<br>Licence Number: 1/141<br>Permit Version: Not Supplied<br>Location: Whitehill Road, GRAVESEND<br>Authority: Environment Agency, Southern Region<br>Abstraction: Industrial Processing ( Miscellaneous)<br>Abstraction Type: Not Supplied<br>Source: Groundwater<br>Daily Rate (m3): 210<br>Yearly Rate (m3): 33500<br>Details: Additional Purpose: Industrial Other<br>Authorised Start: Not Supplied<br>Authorised End: Not Supplied<br>Permit Start Date: Not Supplied<br>Permit End Date: Not Supplied<br>Positional Accuracy: Located by supplier to within 100m                                                          | A14NW (E)                              | 444                          | 2       | 565400 172420 |
| 7      | <b>Water Abstractions</b><br>Operator: Mid Kent Golf Club Limited<br>Licence Number: So/040/0001/019<br>Permit Version: 1<br>Location: Mid Kent Golf Club Borehole<br>Authority: Environment Agency, Southern Region<br>Abstraction: Sports Grounds/Facilities: Spray Irrigation - Storage<br>Abstraction Type: Water may be abstracted from a single point<br>Source: Groundwater<br>Daily Rate (m3): Not Supplied<br>Yearly Rate (m3): Not Supplied<br>Details: Mid Kent Golf Course, Gravesend<br>Authorised Start: 01 April<br>Authorised End: 31 March<br>Permit Start Date: 29th October 2014<br>Permit End Date: Not Supplied<br>Positional Accuracy: Located by supplier to within 10m | A7NE (SW)                              | 756                          | 2       | 564325 171869 |
| 8      | <b>Water Abstractions</b><br>Operator: Southern Water Services Ltd<br>Licence Number: 1/0511/A/G<br>Permit Version: Not Supplied<br>Location: Windmill Hill Pumping Station<br>Authority: Environment Agency, Southern Region<br>Abstraction: Sand And Gravel Washing<br>Abstraction Type: Not Supplied<br>Source: Pond or Lake<br>Daily Rate (m3): 7000<br>Yearly Rate (m3): 2562000<br>Details: Additional Purpose: Public Water Supply<br>Authorised Start: Not Supplied<br>Authorised End: Not Supplied<br>Permit Start Date: Not Supplied<br>Permit End Date: Not Supplied<br>Positional Accuracy: Located by supplier to within 100m                                                     | A18NE (N)                              | 758                          | 2       | 565006 173196 |
| 8      | <b>Water Abstractions</b><br>Operator: Southern Water Services Ltd<br>Licence Number: 01/026<br>Permit Version: Not Supplied<br>Location: Windmill Hill Ps, GRAVESEND<br>Authority: Environment Agency, Southern Region<br>Abstraction: Public Water Supply<br>Abstraction Type: Not Supplied<br>Source: Groundwater<br>Daily Rate (m3): 7000<br>Yearly Rate (m3): 2562000<br>Details: H5 Chalk; Licence Status: Revoked; Lapsed Or Cancelled<br>Authorised Start: Not Supplied<br>Authorised End: Not Supplied<br>Permit Start Date: Not Supplied<br>Permit End Date: Not Supplied<br>Positional Accuracy: Located by supplier to within 100m                                                 | A18NE (N)                              | 763                          | 2       | 565001 173201 |

| Map ID | Details                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR           |
|--------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|------------------------------|---------|---------------|
| 9      | <b>Water Abstractions</b><br>Operator: Southern Water Services Ltd<br>Licence Number: 9/40/01/0511/G<br>Permit Version: 100<br>Location: Boreholes, Adits And Catchpits At Windmill Hill Ps<br>Authority: Environment Agency, Southern Region<br>Abstraction: Public Water Supply: Potable Water Supply - Direct<br>Abstraction Type: Water may be abstracted from any point within an area<br>Source: Groundwater<br>Daily Rate (m3): Not Supplied<br>Yearly Rate (m3): Not Supplied<br>Details: N/A<br>Authorised Start: 01 January<br>Authorised End: 31 December<br>Permit Start Date: 27th November 2006<br>Permit End Date: Not Supplied<br>Positional Accuracy: Located by supplier to within 10m | A18NE (N)                              | 838                          | 2       | 565060 173270 |
|        | <b>Water Abstractions</b><br>Operator: Skanska Civil Engineering<br>Licence Number: 01/164<br>Permit Version: 1<br>Location: Tollgate Junction<br>Authority: Environment Agency, Southern Region<br>Abstraction: Extractive: Dust Suppression<br>Abstraction Type: Water may be abstracted from a single point<br>Source: Groundwater<br>Daily Rate (m3): Not Supplied<br>Yearly Rate (m3): Not Supplied<br>Details: Not Supplied<br>Authorised Start: 01 March<br>Authorised End: 31 October<br>Permit Start Date: 1st November 2007<br>Permit End Date: Not Supplied<br>Positional Accuracy: Located by supplier to within 10m                                                                         | A1NE (SW)                              | 1496                         | 2       | 563900 171250 |
|        | <b>Groundwater Vulnerability Map</b><br>Combined Classification: Principle Bedrock Aquifer - High Vulnerability<br>Combined Vulnerability: High<br>Combined Aquifer: Productive Bedrock Aquifer, No Superficial Aquifer<br>Pollutant Speed: Intermediate<br>Bedrock Flow: Well Connected Fractures<br>Dilution: <300 mm/year<br>Baseflow Index: >70%<br>Superficial Patchiness: <90%<br>Superficial Thickness: <3m<br>Superficial Recharge: No Data                                                                                                                                                                                                                                                      | A13SW (NW)                             | 0                            | 4       | 564920 172404 |
|        | <b>Groundwater Vulnerability - Soluble Rock Risk</b><br>Classification: Very Significant Risk - High Possibility                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | A13SW (NW)                             | 0                            | 4       | 564920 172404 |
|        | <b>Bedrock Aquifer Designations</b><br>Aquifer Designation: Principal Aquifer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | A13SW (NW)                             | 0                            | 4       | 564920 172404 |
|        | <b>Superficial Aquifer Designations</b><br>No Data Available                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                        |                              |         |               |
| 10     | <b>Source Protection Zones</b><br>Name: Not Supplied<br>Source: Environment Agency, Head Office<br>Reference: Not Supplied<br>Type: Zone III (Total Catchment): The total area needed to support the discharge from the protected groundwater source.                                                                                                                                                                                                                                                                                                                                                                                                                                                    | A13SW (NW)                             | 0                            | 2       | 564920 172404 |
| 11     | <b>Source Protection Zones</b><br>Name: Not Supplied<br>Source: Environment Agency, Head Office<br>Reference: Not Supplied<br>Type: Zone II (Outer Protection Zone): Either 25% of the source area or a 400 day travel time whichever is greater.                                                                                                                                                                                                                                                                                                                                                                                                                                                        | A13SW (NW)                             | 0                            | 2       | 564920 172404 |
| 12     | <b>Source Protection Zones</b><br>Name: Not Supplied<br>Source: Environment Agency, Head Office<br>Reference: Not Supplied<br>Type: Zone I (Inner Protection Zone): Travel time of 50 days or less to the groundwater source.                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | A13NE (N)                              | 264                          | 2       | 565023 172692 |

| Map ID | Details                                                                                                                                                                                                                                           | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR           |
|--------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|------------------------------|---------|---------------|
| 13     | <b>Source Protection Zones</b><br>Name: Not Supplied<br>Source: Environment Agency, Head Office<br>Reference: Not Supplied<br>Type: Zone II (Outer Protection Zone): Either 25% of the source area or a 400 day travel time whichever is greater. | A12SW (W)                              | 831                          | 2       | 564074 172227 |
|        | <b>Extreme Flooding from Rivers or Sea without Defences</b><br>None                                                                                                                                                                               |                                        |                              |         |               |
|        | <b>Flooding from Rivers or Sea without Defences</b><br>None                                                                                                                                                                                       |                                        |                              |         |               |
|        | <b>Areas Benefiting from Flood Defences</b><br>None                                                                                                                                                                                               |                                        |                              |         |               |
|        | <b>Flood Water Storage Areas</b><br>None                                                                                                                                                                                                          |                                        |                              |         |               |
|        | <b>Flood Defences</b><br>None                                                                                                                                                                                                                     |                                        |                              |         |               |
| 14     | <b>OS Water Network Lines</b><br>Watercourse Form: Inland river<br>Watercourse Length: 55.1<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Medway<br>Primacy: 1                  | A12NW (W)                              | 816                          | 5       | 564071 172408 |

| Map ID | Details                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR           |
|--------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|------------------------------|---------|---------------|
| 15     | <b>Historical Landfill Sites</b><br>Licence Holder: Not Supplied<br>Location: Gravesend, Kent<br>Name: Woodfield Avenue<br>Operator Location: Not Supplied<br>Boundary Accuracy: As Supplied<br>Provider Reference: EAHLD19319<br>First Input Date: Not Supplied<br>Last Input Date: Not Supplied<br>Specified Waste: Deposited Waste included Inert Waste<br>Type:<br>EA Waste Ref: 0<br>Regis Ref: Not Supplied<br>WRC Ref: 2200/7042<br>BGS Ref: Not Supplied<br>Other Ref: GR8                          | A18SW (NW)                             | 468                          | 2       | 564650 172835 |
| 16     | <b>Historical Landfill Sites</b><br>Licence Holder: Gravesham Borough Council<br>Location: Gravesend, Kent<br>Name: Holyoake Mount<br>Operator Location: Not Supplied<br>Boundary Accuracy: As Supplied<br>Provider Reference: EAHLD19321<br>First Input Date: Not Supplied<br>Last Input Date: Not Supplied<br>Specified Waste: Deposited Waste included Inert and Household Waste<br>Type:<br>EA Waste Ref: 0<br>Regis Ref: Not Supplied<br>WRC Ref: 2200/7036<br>BGS Ref: Not Supplied<br>Other Ref: GR2 | A19SE (NE)                             | 895                          | 2       | 565694 172928 |
|        | <b>Local Authority Landfill Coverage</b><br>Name: Gravesham Borough Council<br>- Has no landfill data to supply                                                                                                                                                                                                                                                                                                                                                                                             |                                        | 0                            | 6       | 564920 172404 |
|        | <b>Local Authority Landfill Coverage</b><br>Name: Kent County Council<br>- Had landfill data but passed it to the relevant environment agency                                                                                                                                                                                                                                                                                                                                                               |                                        | 0                            | 7       | 564920 172404 |
| 17     | <b>Potentially Infilled Land (Non-Water)</b><br>Bearing Ref: NW<br>Use: Unknown Filled Ground (Pit, quarry etc)<br>Date of Mapping: 1991                                                                                                                                                                                                                                                                                                                                                                    | A18SW (NW)                             | 452                          | -       | 564711 172848 |
| 18     | <b>Potentially Infilled Land (Non-Water)</b><br>Bearing Ref: SW<br>Use: Unknown Filled Ground (Pit, quarry etc)<br>Date of Mapping: 1991                                                                                                                                                                                                                                                                                                                                                                    | A7NW (SW)                              | 964                          | -       | 564020 171961 |
| 19     | <b>Potentially Infilled Land (Water)</b><br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1869                                                                                                                                                                                                                                                                                                                                                                      | A18SE (NE)                             | 462                          | -       | 565164 172846 |
| 20     | <b>Potentially Infilled Land (Water)</b><br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1909                                                                                                                                                                                                                                                                                                                                                                      | A18NE (N)                              | 755                          | -       | 564977 173195 |
| 21     | <b>Potentially Infilled Land (Water)</b><br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1869                                                                                                                                                                                                                                                                                                                                                                      | A18NE (N)                              | 789                          | -       | 564997 173227 |

| Map ID | Details                                                                                                                                                                                                                                                                                                                                                | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR           |
|--------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|------------------------------|---------|---------------|
|        | <b>BGS 1:625,000 Solid Geology</b><br>Description: White Chalk Subgroup                                                                                                                                                                                                                                                                                | A13SW (NW)                             | 0                            | 1       | 564920 172404 |
|        | <b>BGS Estimated Soil Chemistry</b><br>Source: British Geological Survey, National Geoscience Information Service<br>Soil Sample Type: Rural Soil<br>Arsenic Concentration: 15 - 25 mg/kg<br>Cadmium Concentration: <1.8 mg/kg<br>Chromium Concentration: 90 - 120 mg/kg<br>Lead Concentration: 100 - 200 mg/kg<br>Nickel Concentration: 30 - 45 mg/kg | A13SW (NW)                             | 0                            | 1       | 564920 172404 |
|        | <b>BGS Estimated Soil Chemistry</b><br>Source: British Geological Survey, National Geoscience Information Service<br>Soil Sample Type: Rural Soil<br>Arsenic Concentration: 15 - 25 mg/kg<br>Cadmium Concentration: <1.8 mg/kg<br>Chromium Concentration: 90 - 120 mg/kg<br>Lead Concentration: 200 - 300 mg/kg<br>Nickel Concentration: 30 - 45 mg/kg | A13NW (N)                              | 60                           | 1       | 564920 172500 |
|        | <b>BGS Estimated Soil Chemistry</b><br>Source: British Geological Survey, National Geoscience Information Service<br>Soil Sample Type: Rural Soil<br>Arsenic Concentration: 15 - 25 mg/kg<br>Cadmium Concentration: <1.8 mg/kg<br>Chromium Concentration: 90 - 120 mg/kg<br>Lead Concentration: <100 mg/kg<br>Nickel Concentration: 30 - 45 mg/kg      | A7NE (SW)                              | 539                          | 1       | 564500 172000 |
|        | <b>BGS Estimated Soil Chemistry</b><br>Source: British Geological Survey, National Geoscience Information Service<br>Soil Sample Type: Rural Soil<br>Arsenic Concentration: 15 - 25 mg/kg<br>Cadmium Concentration: <1.8 mg/kg<br>Chromium Concentration: 90 - 120 mg/kg<br>Lead Concentration: 300 - 600 mg/kg<br>Nickel Concentration: 30 - 45 mg/kg | A18SW (N)                              | 560                          | 1       | 564920 173000 |
|        | <b>BGS Estimated Soil Chemistry</b><br>Source: British Geological Survey, National Geoscience Information Service<br>Soil Sample Type: Rural Soil<br>Arsenic Concentration: <15 mg/kg<br>Cadmium Concentration: <1.8 mg/kg<br>Chromium Concentration: 60 - 90 mg/kg<br>Lead Concentration: 200 - 300 mg/kg<br>Nickel Concentration: 15 - 30 mg/kg      | A18SE (N)                              | 618                          | 1       | 565046 173050 |
|        | <b>BGS Estimated Soil Chemistry</b><br>Source: British Geological Survey, National Geoscience Information Service<br>Soil Sample Type: Rural Soil<br>Arsenic Concentration: <15 mg/kg<br>Cadmium Concentration: <1.8 mg/kg<br>Chromium Concentration: 60 - 90 mg/kg<br>Lead Concentration: 300 - 600 mg/kg<br>Nickel Concentration: 15 - 30 mg/kg      | A18NE (N)                              | 757                          | 1       | 565000 173195 |

| Map ID | Details                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR           |
|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|------------------------------|---------|---------------|
|        | <b>BGS Estimated Soil Chemistry</b><br>Source: British Geological Survey, National Geoscience Information Service<br>Soil Sample Type: Rural Soil<br>Arsenic: 15 - 25 mg/kg<br>Concentration:<br>Cadmium: <1.8 mg/kg<br>Concentration:<br>Chromium: 90 - 120 mg/kg<br>Concentration:<br>Lead Concentration: 300 - 600 mg/kg<br>Nickel: 30 - 45 mg/kg<br>Concentration:                                                                                           | A18NE (N)                              | 825                          | 1       | 565000 173263 |
|        | <b>BGS Estimated Soil Chemistry</b><br>Source: British Geological Survey, National Geoscience Information Service<br>Soil Sample Type: Rural Soil<br>Arsenic: 15 - 25 mg/kg<br>Concentration:<br>Cadmium: <1.8 mg/kg<br>Concentration:<br>Chromium: 90 - 120 mg/kg<br>Concentration:<br>Lead Concentration: 200 - 300 mg/kg<br>Nickel: 30 - 45 mg/kg<br>Concentration:                                                                                           | A18NE (N)                              | 825                          | 1       | 565000 173263 |
|        | <b>BGS Estimated Soil Chemistry</b><br>Source: British Geological Survey, National Geoscience Information Service<br>Soil Sample Type: Rural Soil<br>Arsenic: 15 - 25 mg/kg<br>Concentration:<br>Cadmium: <1.8 mg/kg<br>Concentration:<br>Chromium: 90 - 120 mg/kg<br>Concentration:<br>Lead Concentration: 300 - 600 mg/kg<br>Nickel: 30 - 45 mg/kg<br>Concentration:                                                                                           | A18NW (N)                              | 855                          | 1       | 564908 173295 |
| 22     | <b>BGS Recorded Mineral Sites</b><br>Site Name: Gravesend Denehole<br>Location: Gravesend, Kent<br>Source: British Geological Survey, National Geoscience Information Service<br>Reference: 220928<br>Type: Underground<br><b>Status:</b> Ceased<br>Operator: Unknown Operator<br>Operator Location: Not Supplied<br>Periodic Type: Cretaceous<br>Geology: White Chalk Subgroup<br>Commodity: Chalk<br>Positional Accuracy: Located by supplier to within 10m    | A18SE (NE)                             | 502                          | 1       | 565259 172831 |
| 23     | <b>BGS Recorded Mineral Sites</b><br>Site Name: Gravesend Denehole<br>Location: Gravesend, Kent<br>Source: British Geological Survey, National Geoscience Information Service<br>Reference: 220948<br>Type: Underground<br><b>Status:</b> Ceased<br>Operator: Unknown Operator<br>Operator Location: Not Supplied<br>Periodic Type: Cretaceous<br>Geology: White Chalk Subgroup<br>Commodity: Chalk<br>Positional Accuracy: Located by supplier to within 10m    | A18SE (NE)                             | 556                          | 1       | 565212 172927 |
| 24     | <b>BGS Recorded Mineral Sites</b><br>Site Name: Coombe Road Chalkwell<br>Location: Gravesend, Kent<br>Source: British Geological Survey, National Geoscience Information Service<br>Reference: 220946<br>Type: Underground<br><b>Status:</b> Ceased<br>Operator: Unknown Operator<br>Operator Location: Not Supplied<br>Periodic Type: Cretaceous<br>Geology: White Chalk Subgroup<br>Commodity: Chalk<br>Positional Accuracy: Located by supplier to within 10m | A19SW (NE)                             | 609                          | 1       | 565420 172820 |

| Map ID | Details                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR           |
|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|------------------------------|---------|---------------|
| 25     | <b>BGS Recorded Mineral Sites</b><br>Site Name: Gravesend Denehole<br>Location: Gravesend, Kent<br>Source: British Geological Survey, National Geoscience Information Service<br>Reference: 220379<br>Type: Underground<br><b>Status: Ceased</b><br>Operator: Unknown Operator<br>Operator Location: Not Supplied<br>Periodic Type: Cretaceous<br>Geology: White Chalk Subgroup<br>Commodity: Chalk<br>Positional Accuracy: Located by supplier to within 10m          | A18SW (N)                              | 612                          | 1       | 564815 173042 |
| 25     | <b>BGS Recorded Mineral Sites</b><br>Site Name: Gravesend Denehole<br>Location: Gravesend, Kent<br>Source: British Geological Survey, National Geoscience Information Service<br>Reference: 220785<br>Type: Underground<br><b>Status: Ceased</b><br>Operator: Unknown Operator<br>Operator Location: Not Supplied<br>Periodic Type: Cretaceous<br>Geology: White Chalk Subgroup<br>Commodity: Chalk<br>Positional Accuracy: Located by supplier to within 10m          | A18SW (N)                              | 623                          | 1       | 564816 173053 |
| 26     | <b>BGS Recorded Mineral Sites</b><br>Site Name: Gravesend Denehole<br>Location: Gravesend, Kent<br>Source: British Geological Survey, National Geoscience Information Service<br>Reference: 220290<br>Type: Underground<br><b>Status: Ceased</b><br>Operator: Unknown Operator<br>Operator Location: Not Supplied<br>Periodic Type: Cretaceous<br>Geology: White Chalk Subgroup<br>Commodity: Chalk<br>Positional Accuracy: Located by supplier to within 10m          | A8SW (S)                               | 710                          | 1       | 564890 171659 |
| 27     | <b>BGS Recorded Mineral Sites</b><br>Site Name: Windmill Hill Brick Works<br>Location: Gravesend, Kent<br>Source: British Geological Survey, National Geoscience Information Service<br>Reference: 192538<br>Type: Opencast<br><b>Status: Ceased</b><br>Operator: Unknown Operator<br>Operator Location: Not Supplied<br>Periodic Type: Quaternary<br>Geology: Head<br>Commodity: Common Clay and Shale<br>Positional Accuracy: Located by supplier to within 10m      | A17NE (NW)                             | 763                          | 1       | 564518 173100 |
| 28     | <b>BGS Recorded Mineral Sites</b><br>Site Name: Durndale Chalk Pit<br>Location: Northfleet, Gravesend, Kent<br>Source: British Geological Survey, National Geoscience Information Service<br>Reference: 131060<br>Type: Opencast<br><b>Status: Ceased</b><br>Operator: Unknown Operator<br>Operator Location: Not Supplied<br>Periodic Type: Cretaceous<br>Geology: White Chalk Subgroup<br>Commodity: Chalk<br>Positional Accuracy: Located by supplier to within 10m | A7NW (SW)                              | 964                          | 1       | 564020 171959 |
|        | <b>BGS Measured Urban Soil Chemistry</b><br>No data available                                                                                                                                                                                                                                                                                                                                                                                                          |                                        |                              |         |               |
|        | <b>BGS Urban Soil Chemistry Averages</b><br>No data available                                                                                                                                                                                                                                                                                                                                                                                                          |                                        |                              |         |               |
|        | <b>Coal Mining Affected Areas</b><br>In an area that might not be affected by coal mining                                                                                                                                                                                                                                                                                                                                                                              |                                        |                              |         |               |
|        | <b>Mining Instability</b><br>Mining Evidence: Inconclusive Rock Mining<br>Source: Ove Arup & Partners<br>Boundary Quality: As Supplied                                                                                                                                                                                                                                                                                                                                 | A13SW (NW)                             | 0                            | -       | 564920 172404 |

| Map ID | Details                                                                                                                                                                                                                                                                                                                                                                                    | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR           |
|--------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|------------------------------|---------|---------------|
|        | <b>Man-Made Mining Cavities</b><br>Easting: 564900<br>Northing: 172100<br>Distance: 269<br>Quadrant Reference: A13<br>Quadrant Reference: SW<br>Bearing Ref: S<br>Cavity Type: Denehole:- vertical shaft having chambers at the base<br>Commodity: Chalk<br>Solid Geology Detail: Chalk Group<br>Superficial Geology No Details<br>Detail:                                                 | A13SW (S)                              | 269                          | 8       | 564900 172100 |
|        | <b>Man-Made Mining Cavities</b><br>Easting: 565300<br>Northing: 172800<br>Distance: 506<br>Quadrant Reference: A19<br>Quadrant Reference: SW<br>Bearing Ref: NE<br>Cavity Type: Multiple Chalkwells<br>Commodity: Chalk<br>Solid Geology Detail: Thanet Sand Formation, Chalk Group<br>Superficial Geology No Details<br>Detail:                                                           | A19SW (NE)                             | 506                          | 8       | 565300 172800 |
|        | <b>Man-Made Mining Cavities</b><br>Easting: 565400<br>Northing: 172800<br>Distance: 581<br>Quadrant Reference: A19<br>Quadrant Reference: SW<br>Bearing Ref: NE<br>Cavity Type: Chalkwell<br>Commodity: Chalk<br>Solid Geology Detail: Thanet Sand Formation, Chalk Group<br>Superficial Geology No Details<br>Detail:                                                                     | A19SW (NE)                             | 581                          | 8       | 565400 172800 |
|        | <b>Man-Made Mining Cavities</b><br>Easting: 564500<br>Northing: 172900<br>Distance: 608<br>Quadrant Reference: A17<br>Quadrant Reference: SE<br>Bearing Ref: NW<br>Cavity Type: Chalkwell Marked<br>Commodity: Chalk<br>Solid Geology Detail: Thanet Sand Formation, Chalk Group<br>Superficial Geology No Details<br>Detail:                                                              | A17SE (NW)                             | 608                          | 8       | 564500 172900 |
|        | <b>Man-Made Mining Cavities</b><br>Easting: 564900<br>Northing: 173200<br>Distance: 761<br>Quadrant Reference: A18<br>Quadrant Reference: NW<br>Bearing Ref: N<br>Cavity Type: Denehole:- vertical shaft having chambers at the base<br>Commodity: Chalk<br>Solid Geology Detail: Lambeth Group, Thanet Sand Formation, Upper Chalk Formation<br>Superficial Geology No Details<br>Detail: | A18NW (N)                              | 761                          | 8       | 564900 173200 |
|        | <b>Man-Made Mining Cavities</b><br>Easting: 563900<br>Northing: 172400<br>Distance: 987<br>Quadrant Reference: A11<br>Quadrant Reference: SE<br>Bearing Ref: W<br>Cavity Type: Mine Collapse<br>Commodity: Chalk<br>Solid Geology Detail: Thanet Sad Formation, Chalk Group<br>Superficial Geology No Details<br>Detail:                                                                   | A11SE (W)                              | 987                          | 8       | 563900 172400 |
|        | <b>Non Coal Mining Areas of Great Britain</b><br>Risk: Unlikely<br>Source: British Geological Survey, National Geoscience Information Service                                                                                                                                                                                                                                              | A13SW (NW)                             | 0                            | 1       | 564920 172404 |

| Map ID | Details                                                                                                                                                                                                                                                                   | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR           |
|--------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|------------------------------|---------|---------------|
|        | <b>Non Coal Mining Areas of Great Britain</b><br>Risk: Rare<br>Source: British Geological Survey, National Geoscience Information Service                                                                                                                                 | A13SE (E)                              | 42                           | 1       | 565000 172404 |
|        | <b>Non Coal Mining Areas of Great Britain</b><br>Risk: Rare<br>Source: British Geological Survey, National Geoscience Information Service                                                                                                                                 | A13SE (E)                              | 42                           | 1       | 565000 172404 |
|        | <b>Potential for Collapsible Ground Stability Hazards</b><br>Hazard Potential: Very Low<br>Source: British Geological Survey, National Geoscience Information Service                                                                                                     | A13SW (NW)                             | 0                            | 1       | 564920 172404 |
|        | <b>Potential for Collapsible Ground Stability Hazards</b><br>Hazard Potential: Very Low<br>Source: British Geological Survey, National Geoscience Information Service                                                                                                     | A13SE (E)                              | 42                           | 1       | 565000 172404 |
|        | <b>Potential for Compressible Ground Stability Hazards</b><br>Hazard Potential: No Hazard<br>Source: British Geological Survey, National Geoscience Information Service                                                                                                   | A13SW (NW)                             | 0                            | 1       | 564920 172404 |
|        | <b>Potential for Compressible Ground Stability Hazards</b><br>Hazard Potential: No Hazard<br>Source: British Geological Survey, National Geoscience Information Service                                                                                                   | A13SE (E)                              | 42                           | 1       | 565000 172404 |
|        | <b>Potential for Ground Dissolution Stability Hazards</b><br>Hazard Potential: Very Low<br>Source: British Geological Survey, National Geoscience Information Service                                                                                                     | A13SW (NW)                             | 0                            | 1       | 564920 172404 |
|        | <b>Potential for Ground Dissolution Stability Hazards</b><br>Hazard Potential: Very Low<br>Source: British Geological Survey, National Geoscience Information Service                                                                                                     | A13SE (E)                              | 42                           | 1       | 565000 172404 |
|        | <b>Potential for Ground Dissolution Stability Hazards</b><br>Hazard Potential: Moderate<br>Source: British Geological Survey, National Geoscience Information Service                                                                                                     | A13NW (N)                              | 156                          | 1       | 564868 172590 |
|        | <b>Potential for Ground Dissolution Stability Hazards</b><br>Hazard Potential: Moderate<br>Source: British Geological Survey, National Geoscience Information Service                                                                                                     | A13NE (N)                              | 196                          | 1       | 565000 172627 |
|        | <b>Potential for Landslide Ground Stability Hazards</b><br>Hazard Potential: No Hazard<br>Source: British Geological Survey, National Geoscience Information Service                                                                                                      | A13SW (NW)                             | 0                            | 1       | 564920 172404 |
|        | <b>Potential for Landslide Ground Stability Hazards</b><br>Hazard Potential: No Hazard<br>Source: British Geological Survey, National Geoscience Information Service                                                                                                      | A13SE (E)                              | 42                           | 1       | 565000 172404 |
|        | <b>Potential for Running Sand Ground Stability Hazards</b><br>Hazard Potential: No Hazard<br>Source: British Geological Survey, National Geoscience Information Service                                                                                                   | A13SW (NW)                             | 0                            | 1       | 564920 172404 |
|        | <b>Potential for Running Sand Ground Stability Hazards</b><br>Hazard Potential: No Hazard<br>Source: British Geological Survey, National Geoscience Information Service                                                                                                   | A13SE (E)                              | 42                           | 1       | 565000 172404 |
|        | <b>Potential for Shrinking or Swelling Clay Ground Stability Hazards</b><br>Hazard Potential: No Hazard<br>Source: British Geological Survey, National Geoscience Information Service                                                                                     | A13SW (NW)                             | 0                            | 1       | 564920 172404 |
|        | <b>Potential for Shrinking or Swelling Clay Ground Stability Hazards</b><br>Hazard Potential: No Hazard<br>Source: British Geological Survey, National Geoscience Information Service                                                                                     | A13SE (E)                              | 42                           | 1       | 565000 172404 |
|        | <b>Radon Potential - Radon Affected Areas</b><br>Affected Area: The property is in a Lower probability radon area (less than 1% of homes are estimated to be at or above the Action Level).<br>Source: British Geological Survey, National Geoscience Information Service | A13SW (NW)                             | 0                            | 1       | 564920 172404 |
|        | <b>Radon Potential - Radon Protection Measures</b><br>Protection Measure: No radon protective measures are necessary in the construction of new dwellings or extensions<br>Source: British Geological Survey, National Geoscience Information Service                     | A13SW (NW)                             | 0                            | 1       | 564920 172404 |

| Map ID | Details                                                                                                                                                                                                                                                                                               | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR           |
|--------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|------------------------------|---------|---------------|
| 29     | <b>Contemporary Trade Directory Entries</b><br>Name: Aintree Concrete Pumping<br>Location: 21, Aintree Close, Gravesend, Kent, DA12 5AS<br>Classification: Concrete & Mortar Ready Mixed<br><b>Status: Active</b><br>Positional Accuracy: Automatically positioned to the address                     | A13SW (SW)                             | 113                          | -       | 564797 172309 |
| 30     | <b>Contemporary Trade Directory Entries</b><br>Name: Simon Lancaster Interiors<br>Location: 9, Gatwick Road, GRAVESEND, Kent, DA12 5AJ<br>Classification: Blinds, Awnings & Canopies<br><b>Status: Inactive</b><br>Positional Accuracy: Automatically positioned to the address                       | A13NW (NW)                             | 143                          | -       | 564842 172568 |
| 31     | <b>Contemporary Trade Directory Entries</b><br>Name: Success 1 2 3 Beams<br>Location: 8, Northridge Road, Gravesend, DA12 5AY<br>Classification: Sports Equipment Manufacturers & Distributors<br><b>Status: Inactive</b><br>Positional Accuracy: Automatically positioned to the address             | A13NE (E)                              | 156                          | -       | 565104 172445 |
| 32     | <b>Contemporary Trade Directory Entries</b><br>Name: Associated Environmental Services<br>Location: 53, Ridgeway Avenue, Gravesend, Kent, DA12 5BD<br>Classification: Air Conditioning Equipment & Systems<br><b>Status: Inactive</b><br>Positional Accuracy: Automatically positioned to the address | A13SE (S)                              | 176                          | -       | 564974 172206 |
| 33     | <b>Contemporary Trade Directory Entries</b><br>Name: Hydrofresh<br>Location: 125, Singlewell Road, Gravesend, DA11 7QA<br>Classification: Water Softeners<br><b>Status: Active</b><br>Positional Accuracy: Automatically positioned to the address                                                    | A13NW (NW)                             | 301                          | -       | 564688 172656 |
| 34     | <b>Contemporary Trade Directory Entries</b><br>Name: Pimms Diy & Hardware Store<br>Location: 4, Kitchener Avenue, Gravesend, Kent, DA12 5HY<br>Classification: Hardware<br><b>Status: Active</b><br>Positional Accuracy: Automatically positioned to the address                                      | A14NW (E)                              | 320                          | -       | 565273 172440 |
| 34     | <b>Contemporary Trade Directory Entries</b><br>Name: Gemini Engineering<br>Location: 121, Sun Lane, Gravesend, Kent, DA12 5HW<br>Classification: Garage Services<br><b>Status: Inactive</b><br>Positional Accuracy: Automatically positioned to the address                                           | A14NW (E)                              | 358                          | -       | 565308 172460 |
| 34     | <b>Contemporary Trade Directory Entries</b><br>Name: Stewart Fowler<br>Location: 121, Sun Lane, Gravesend, Kent, DA12 5HW<br>Classification: Car Dealers - Used<br><b>Status: Inactive</b><br>Positional Accuracy: Automatically positioned to the address                                            | A14NW (E)                              | 358                          | -       | 565308 172460 |
| 34     | <b>Contemporary Trade Directory Entries</b><br>Name: Carpetpride Carpet & Upholstery Cleaners<br>Location: 129, Sun Lane, Gravesend, Kent, DA12 5HW<br>Classification: Carpet, Curtain & Upholstery Cleaners<br><b>Status: Active</b><br>Positional Accuracy: Automatically positioned to the address | A14NW (E)                              | 376                          | -       | 565329 172444 |
| 35     | <b>Contemporary Trade Directory Entries</b><br>Name: A R C Office Systems<br>Location: 73, Sun Lane, Gravesend, Kent, DA12 5HQ<br>Classification: Office Equipment Servicing & Maintenance<br><b>Status: Inactive</b><br>Positional Accuracy: Automatically positioned to the address                 | A13NE (NE)                             | 327                          | -       | 565224 172609 |
| 35     | <b>Contemporary Trade Directory Entries</b><br>Name: Fizzers Paints<br>Location: 71, Sun Lane, Gravesend, Kent, DA12 5HQ<br>Classification: Painting & Decorating Supplies<br><b>Status: Inactive</b><br>Positional Accuracy: Automatically positioned to the address                                 | A13NE (NE)                             | 330                          | -       | 565224 172615 |
| 36     | <b>Contemporary Trade Directory Entries</b><br>Name: Kent Scale & Cash Register Co<br>Location: 55, Sun Lane, Gravesend, Kent, DA12 5HQ<br>Classification: Cash Registers & Check-Out Equipment<br><b>Status: Inactive</b><br>Positional Accuracy: Automatically positioned to the address            | A13NE (NE)                             | 336                          | -       | 565199 172659 |

| Map ID | Details                                                                                                                                                                                                                                                                                           | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR           |
|--------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|------------------------------|---------|---------------|
| 37     | <b>Contemporary Trade Directory Entries</b><br>Name: Mhm International<br>Location: Aercon House, Alfred Road, Gravesend, DA11 7QF<br>Classification: Lamination & Encapsulation Services<br>Status: <b>Inactive</b><br>Positional Accuracy: Automatically positioned to the address              | A13NW (NW)                             | 346                          | -       | 564631 172664 |
| 37     | <b>Contemporary Trade Directory Entries</b><br>Name: Aercon Wiring Systems Ltd<br>Location: Aercon House, Alfred Road, Gravesend, Kent, DA11 7QF<br>Classification: Wire Products - Manufacturers<br>Status: <b>Inactive</b><br>Positional Accuracy: Automatically positioned to the address      | A13NW (NW)                             | 347                          | -       | 564631 172665 |
| 37     | <b>Contemporary Trade Directory Entries</b><br>Name: Kent Cleaning Services<br>Location: Aercon Ho, Alfred Rd, Gravesend, Kent, DA11 7QF<br>Classification: Cleaning Services - Commercial<br>Status: <b>Inactive</b><br>Positional Accuracy: Manually positioned to the address or location      | A13NW (NW)                             | 397                          | -       | 564592 172696 |
| 38     | <b>Contemporary Trade Directory Entries</b><br>Name: D'Arcy Jewellery Repair Centre<br>Location: 101a, Sun Lane, Gravesend, Kent, DA12 5HW<br>Classification: Jewellery Manufacturers & Repairers<br>Status: <b>Inactive</b><br>Positional Accuracy: Automatically positioned to the address      | A14NW (E)                              | 348                          | -       | 565285 172512 |
| 39     | <b>Contemporary Trade Directory Entries</b><br>Name: Jackson Construction<br>Location: The Fairway, Gravesend, Kent, DA11 7LN<br>Classification: Joinery Manufacturers<br>Status: <b>Inactive</b><br>Positional Accuracy: Manually positioned to the road within the address or location          | A12NE (W)                              | 354                          | -       | 564547 172526 |
| 40     | <b>Contemporary Trade Directory Entries</b><br>Name: C T Heating & Plumbing<br>Location: 62, Portland Avenue, Gravesend, Kent, DA12 5HJ<br>Classification: Boilers - Servicing, Replacements & Repairs<br>Status: <b>Inactive</b><br>Positional Accuracy: Automatically positioned to the address | A18SE (N)                              | 358                          | -       | 564995 172794 |
| 41     | <b>Contemporary Trade Directory Entries</b><br>Name: Green Flag<br>Location: 74, Singlewell Road, Gravesend, Kent, DA11 7PT<br>Classification: Car Engine Tuning & Diagnostic Services<br>Status: <b>Inactive</b><br>Positional Accuracy: Automatically positioned to the address                 | A18SW (N)                              | 414                          | -       | 564756 172826 |
| 41     | <b>Contemporary Trade Directory Entries</b><br>Name: Aventus Environmental<br>Location: 66-68, Singlewell Road, Gravesend, DA11 7PW<br>Classification: Engineering Services<br>Status: <b>Active</b><br>Positional Accuracy: Automatically positioned to the address                              | A18SW (N)                              | 447                          | -       | 564759 172861 |
| 42     | <b>Contemporary Trade Directory Entries</b><br>Name: Traditional English Guncases<br>Location: 53, Whitehill Road, Gravesend, Kent, DA12 5PF<br>Classification: Leather Garments & Products<br>Status: <b>Active</b><br>Positional Accuracy: Automatically positioned to the address              | A14NW (NE)                             | 439                          | -       | 565282 172721 |
| 43     | <b>Contemporary Trade Directory Entries</b><br>Name: Rubbish 2 Go<br>Location: 62, The Fairway, Gravesend, Kent, DA11 7LW<br>Classification: Waste Disposal Services<br>Status: <b>Inactive</b><br>Positional Accuracy: Automatically positioned to the address                                   | A12NE (W)                              | 440                          | -       | 564462 172544 |
| 44     | <b>Contemporary Trade Directory Entries</b><br>Name: Bed Bugs Solutions<br>Location: 27, Queens Road, Gravesend, Kent, DA12 5JP<br>Classification: Pest & Vermin Control<br>Status: <b>Inactive</b><br>Positional Accuracy: Automatically positioned to the address                               | A14SW (SE)                             | 442                          | -       | 565325 172136 |
| 45     | <b>Contemporary Trade Directory Entries</b><br>Name: Top Notch Dry Cleaners<br>Location: 7, Cross Lane West, Gravesend, DA11 7PZ<br>Classification: Dry Cleaners<br>Status: <b>Active</b><br>Positional Accuracy: Automatically positioned to the address                                         | A18SW (NW)                             | 459                          | -       | 564667 172835 |

| Map ID | Details                                                                                                                                                                                                                                                                              | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR           |
|--------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|------------------------------|---------|---------------|
| 45     | <b>Contemporary Trade Directory Entries</b><br>Name: Hrk<br>Location: 7, Cross Lane West, Gravesend, Kent, DA11 7PZ<br>Classification: Dry Cleaners<br><b>Status:</b> Inactive<br>Positional Accuracy: Automatically positioned to the address                                       | A18SW (NW)                             | 459                          | -       | 564667 172835 |
| 46     | <b>Contemporary Trade Directory Entries</b><br>Name: Singlewell Stationery & Print<br>Location: B, 41, Singlewell Road, Gravesend, Kent, DA11 7PN<br>Classification: Printers<br><b>Status:</b> Active<br>Positional Accuracy: Automatically positioned to the address               | A18SW (N)                              | 475                          | -       | 564725 172879 |
| 46     | <b>Contemporary Trade Directory Entries</b><br>Name: Flat Packs R Us Ltd<br>Location: 1, Leigh Road, Gravesend, Kent, DA11 7PS<br>Classification: Furniture Manufacturers - Home & Office<br><b>Status:</b> Inactive<br>Positional Accuracy: Automatically positioned to the address | A18SW (NW)                             | 520                          | -       | 564703 172919 |
| 47     | <b>Contemporary Trade Directory Entries</b><br>Name: I F L Cleaning<br>Location: 21, Cross Lane West, Gravesend, DA11 7PZ<br>Classification: Commercial Cleaning Services<br><b>Status:</b> Active<br>Positional Accuracy: Automatically positioned to the address                   | A18SW (NW)                             | 475                          | -       | 564598 172808 |
| 48     | <b>Contemporary Trade Directory Entries</b><br>Name: Performance Cars Kent Ltd<br>Location: 50, Singlewell Road, Gravesend, Kent, DA11 7PW<br>Classification: Car Dealers<br><b>Status:</b> Inactive<br>Positional Accuracy: Automatically positioned to the address                 | A18SW (N)                              | 477                          | -       | 564779 172897 |
| 48     | <b>Contemporary Trade Directory Entries</b><br>Name: Mr Clutch<br>Location: 50, Singlewell Road, Gravesend, DA11 7PW<br>Classification: Garage Services<br><b>Status:</b> Active<br>Positional Accuracy: Automatically positioned to the address                                     | A18SW (N)                              | 477                          | -       | 564779 172897 |
| 48     | <b>Contemporary Trade Directory Entries</b><br>Name: W R M C<br>Location: 50, Singlewell Road, Gravesend, Kent, DA11 7PW<br>Classification: Garage Services<br><b>Status:</b> Inactive<br>Positional Accuracy: Automatically positioned to the address                               | A18SW (N)                              | 477                          | -       | 564779 172897 |
| 49     | <b>Contemporary Trade Directory Entries</b><br>Name: Key Contractors<br>Location: 6a, Sun Lane, Gravesend, Kent, DA12 5HG<br>Classification: Damp & Dry Rot Control<br><b>Status:</b> Active<br>Positional Accuracy: Automatically positioned to the address                         | A18SE (NE)                             | 477                          | -       | 565158 172866 |
| 50     | <b>Contemporary Trade Directory Entries</b><br>Name: A C M Autos<br>Location: 1a, Coombe Road, Gravesend, Kent, DA12 5PB<br>Classification: Garage Services<br><b>Status:</b> Active<br>Positional Accuracy: Automatically positioned to the address                                 | A19SW (NE)                             | 513                          | -       | 565299 172810 |
| 50     | <b>Contemporary Trade Directory Entries</b><br>Name: Cat Vehicle Alarms<br>Location: 1, Coombe Road, Gravesend, Kent, DA12 5PB<br>Classification: Garage Services<br><b>Status:</b> Inactive<br>Positional Accuracy: Automatically positioned to the address                         | A19SW (NE)                             | 518                          | -       | 565311 172806 |
| 51     | <b>Contemporary Trade Directory Entries</b><br>Name: Maestro International Ltd<br>Location: 5, Whitehill Road, Gravesend, Kent, DA12 5PE<br>Classification: Engineers - General<br><b>Status:</b> Inactive<br>Positional Accuracy: Automatically positioned to the address           | A18SE (NE)                             | 526                          | -       | 565205 172896 |
| 51     | <b>Contemporary Trade Directory Entries</b><br>Name: Danmar Concrete Pumps Ltd<br>Location: 1, St. Marys Close, Gravesend, Kent, DA12 5PA<br>Classification: Concrete Pumping Services<br><b>Status:</b> Active<br>Positional Accuracy: Automatically positioned to the address      | A18SE (NE)                             | 553                          | -       | 565253 172899 |

| Map ID | Details                                                                                                                                                                                                                                                                                                                         | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR           |
|--------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|------------------------------|---------|---------------|
| 52     | <b>Contemporary Trade Directory Entries</b><br>Name: Gks Services Ltd<br>Location: 3, Echo Square, Gravesend, Kent, DA12 1NP<br>Classification: Boilers - Servicing, Replacements & Repairs<br><b>Status:</b> Inactive<br>Positional Accuracy: Automatically positioned to the address                                          | A18SE (NE)                             | 538                          | -       | 565168 172929 |
| 53     | <b>Contemporary Trade Directory Entries</b><br>Name: Cleanesteam<br>Location: 15, Trosley Avenue, Gravesend, Kent, DA11 7QN<br>Classification: Carpet, Curtain & Upholstery Cleaners<br><b>Status:</b> Inactive<br>Positional Accuracy: Automatically positioned to the address                                                 | A17SE (NW)                             | 559                          | -       | 564527 172859 |
| 54     | <b>Contemporary Trade Directory Entries</b><br>Name: D R J European<br>Location: 9, New House Lane, Gravesend, Kent, DA11 7LP<br>Classification: Road Haulage Services<br><b>Status:</b> Inactive<br>Positional Accuracy: Automatically positioned to the address                                                               | A17SE (NW)                             | 561                          | -       | 564426 172750 |
| 55     | <b>Contemporary Trade Directory Entries</b><br>Name: D L F Forklift Services<br>Location: 35, Princes Road, GRAVESEND, Kent, DA12 5JJ<br>Classification: Fork Lift Trucks<br><b>Status:</b> Inactive<br>Positional Accuracy: Automatically positioned to the address                                                            | A9NW (SE)                              | 570                          | -       | 565423 172053 |
| 56     | <b>Contemporary Trade Directory Entries</b><br>Name: Meopham Cleaning<br>Location: 44, Trosley Avenue, Gravesend, Kent, DA11 7QW<br>Classification: Cleaning Services - Domestic<br><b>Status:</b> Inactive<br>Positional Accuracy: Automatically positioned to the address                                                     | A17SE (NW)                             | 619                          | -       | 564554 172954 |
| 56     | <b>Contemporary Trade Directory Entries</b><br>Name: Direct Pest Solutions Ltd<br>Location: 54, Trosley Avenue, Gravesend, Kent, DA11 7QW<br>Classification: Pest & Vermin Control<br><b>Status:</b> Inactive<br>Positional Accuracy: Automatically positioned to the address                                                   | A17SE (NW)                             | 644                          | -       | 564554 172982 |
| 57     | <b>Contemporary Trade Directory Entries</b><br>Name: Db Recovery<br>Location: 56, Glen View, Gravesend, Kent, DA12 1LP<br>Classification: Car Breakers & Dismantlers<br><b>Status:</b> Inactive<br>Positional Accuracy: Automatically positioned to the address                                                                 | A18SE (N)                              | 621                          | -       | 565097 173042 |
| 58     | <b>Contemporary Trade Directory Entries</b><br>Name: Accutic Design<br>Location: 264, Singlewell Road, GRAVESEND, Kent, DA11 7RE<br>Classification: Clocks & Watches - Manufacturers & Wholesalers<br><b>Status:</b> Inactive<br>Positional Accuracy: Automatically positioned to the address                                   | A8SW (S)                               | 658                          | -       | 564818 171714 |
| 59     | <b>Contemporary Trade Directory Entries</b><br>Name: North Fleet Construction Ltd<br>Location: 1, Old Road East, Gravesend, Kent, DA12 1NJ<br>Classification: Concrete Contractors<br><b>Status:</b> Inactive<br>Positional Accuracy: Manually positioned to the address or location                                            | A18NW (N)                              | 681                          | -       | 564831 173113 |
| 60     | <b>Contemporary Trade Directory Entries</b><br>Name: Mosaic Print<br>Location: 23, Exeter Road, Gravesend, Kent, DA12 5QX<br>Classification: Printers<br><b>Status:</b> Inactive<br>Positional Accuracy: Automatically positioned to the address                                                                                | A14SE (E)                              | 742                          | -       | 565696 172310 |
| 61     | <b>Contemporary Trade Directory Entries</b><br>Name: Expert Maintenance Services Ltd<br>Location: New House Lane, Northfleet, Gravesend, Kent, DA11 7HJ<br>Classification: Air Conditioning & Refrigeration Contractors<br><b>Status:</b> Inactive<br>Positional Accuracy: Manually positioned within the geographical locality | A12NW (W)                              | 755                          | -       | 564164 172645 |
| 62     | <b>Contemporary Trade Directory Entries</b><br>Name: Dave'S Carpet Cleaning<br>Location: 32, Taunton Vale, Gravesend, Kent, DA12 5RB<br>Classification: Cleaning Services - Domestic<br><b>Status:</b> Inactive<br>Positional Accuracy: Automatically positioned to the address                                                 | A14SE (E)                              | 794                          | -       | 565748 172305 |

| Map ID | Details                                                                                                                                                                                                                                                                                        | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR           |
|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|------------------------------|---------|---------------|
| 63     | <b>Contemporary Trade Directory Entries</b><br>Name: Kent & Essex Leafleteers<br>Location: 97, New House Lane, Northfleet, Gravesend, Kent, DA11 7HJ<br>Classification: Distribution Services<br>Status: Inactive<br>Positional Accuracy: Automatically positioned to the address              | A12NW (W)                              | 798                          | -       | 564110 172610 |
| 64     | <b>Contemporary Trade Directory Entries</b><br>Name: T R M<br>Location: 40, Old Road West, Gravesend, Kent, DA11 0LJ<br>Classification: Meat - Wholesale<br>Status: Inactive<br>Positional Accuracy: Automatically positioned to the address                                                   | A17NE (NW)                             | 819                          | -       | 564547 173176 |
| 64     | <b>Contemporary Trade Directory Entries</b><br>Name: Spectrum Surveillance Ltd<br>Location: 112-118, Wrotham Road, Gravesend, Kent, DA11 0QH<br>Classification: Catering Equipment<br>Status: Inactive<br>Positional Accuracy: Automatically positioned to the address                         | A17NE (NW)                             | 834                          | -       | 564561 173199 |
| 64     | <b>Contemporary Trade Directory Entries</b><br>Name: 1st Direct Supplies Ltd<br>Location: 112, Wrotham Road, Gravesend, Kent, DA11 0QH<br>Classification: Fasteners & Fixing Devices<br>Status: Inactive<br>Positional Accuracy: Automatically positioned to the address                       | A17NE (NW)                             | 834                          | -       | 564561 173199 |
| 65     | <b>Contemporary Trade Directory Entries</b><br>Name: Rads 'R' Us<br>Location: 41, Haynes Road, Northfleet, Gravesend, Kent, DA11 7HL<br>Classification: Car Radiator Servicing & Repairs<br>Status: Inactive<br>Positional Accuracy: Automatically positioned to the address                   | A12NW (W)                              | 850                          | -       | 564037 172448 |
| 66     | <b>Contemporary Trade Directory Entries</b><br>Name: Tudor Chews<br>Location: 5, Westcott Avenue, Northfleet, Gravesend, Kent, DA11 7HP<br>Classification: Pet Foods & Animal Feeds<br>Status: Inactive<br>Positional Accuracy: Automatically positioned to the address                        | A12SW (W)                              | 857                          | -       | 564030 172398 |
| 67     | <b>Contemporary Trade Directory Entries</b><br>Name: Biggs Pest Damp & Timber Solutions<br>Location: 85, Taunton Vale, Gravesend, DA12 5QZ<br>Classification: Pest & Vermin Control<br>Status: Active<br>Positional Accuracy: Automatically positioned to the address                          | A14SE (E)                              | 861                          | -       | 565788 172155 |
| 67     | <b>Contemporary Trade Directory Entries</b><br>Name: Guardian Cradle Safety Services<br>Location: 85, Taunton Vale, Gravesend, Kent, DA12 5QZ<br>Classification: Engineers - General<br>Status: Inactive<br>Positional Accuracy: Automatically positioned to the address                       | A14SE (E)                              | 861                          | -       | 565789 172156 |
| 68     | <b>Contemporary Trade Directory Entries</b><br>Name: H & A Skips<br>Location: 21, Ferguson Avenue, Gravesend, Kent, DA12 5LX<br>Classification: Waste Disposal Services<br>Status: Inactive<br>Positional Accuracy: Automatically positioned to the address                                    | A9SW (SE)                              | 863                          | -       | 565502 171712 |
| 69     | <b>Contemporary Trade Directory Entries</b><br>Name: Country Fresh Cleaning Services<br>Location: 5, Lynton Road South, Gravesend, Kent, DA11 7NF<br>Classification: Carpet, Curtain & Upholstery Cleaners<br>Status: Inactive<br>Positional Accuracy: Automatically positioned to the address | A17NE (NW)                             | 875                          | -       | 564362 173131 |
| 70     | <b>Contemporary Trade Directory Entries</b><br>Name: Robert L Huggett<br>Location: 12, Lawrance Square, Haynes Road, Northfleet, Gravesend, Kent, DA11 7HW<br>Classification: Printers<br>Status: Inactive<br>Positional Accuracy: Automatically positioned to the address                     | A12NW (W)                              | 922                          | -       | 563965 172465 |
| 71     | <b>Contemporary Trade Directory Entries</b><br>Name: Wolefag Enterprises Ltd<br>Location: 1, Millers Terrace, Shrubbery Road, Gravesend, Kent, DA12 1JW<br>Classification: Car Dealers<br>Status: Inactive<br>Positional Accuracy: Automatically positioned to the address                     | A18NE (N)                              | 927                          | -       | 564983 173366 |

| Map ID | Details                                                                                                                                                                                                                                                                                      | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR           |
|--------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|------------------------------|---------|---------------|
| 72     | <b>Contemporary Trade Directory Entries</b><br>Name: M & J<br>Location: 32, Thomas Drive, Gravesend, Kent, DA12 5PZ<br>Classification: Commercial Cleaning Services<br>Status: Inactive<br>Positional Accuracy: Automatically positioned to the address                                      | A14NE (E)                              | 941                          | -       | 565878 172583 |
| 73     | <b>Contemporary Trade Directory Entries</b><br>Name: Chips Away<br>Location: 84, Old Road East, Gravesend, Kent, DA12 1PE<br>Classification: Car Body Repairs<br>Status: Inactive<br>Positional Accuracy: Automatically positioned to the address                                            | A19SE (NE)                             | 946                          | -       | 565659 173060 |
| 74     | <b>Contemporary Trade Directory Entries</b><br>Name: Valley Dry Cleaners<br>Location: 8, The Parade, Valley Drive, Gravesend, Kent, DA12 5RT<br>Classification: Dry Cleaners<br>Status: Inactive<br>Positional Accuracy: Automatically positioned to the address                             | A14NE (E)                              | 980                          | -       | 565905 172639 |
| 74     | <b>Contemporary Trade Directory Entries</b><br>Name: Valley Dry Cleaners<br>Location: 8, The Parade, Valley Drive, Gravesend, Kent, DA12 5RT<br>Classification: Dry Cleaners<br>Status: Inactive<br>Positional Accuracy: Automatically positioned to the address                             | A14NE (E)                              | 980                          | -       | 565905 172639 |
| 74     | <b>Contemporary Trade Directory Entries</b><br>Name: Valley Dry Cleaners<br>Location: 8, The Parade, Valley Drive, Gravesend, Kent, DA12 5RT<br>Classification: Dry Cleaners<br>Status: Active<br>Positional Accuracy: Automatically positioned to the address                               | A14NE (E)                              | 980                          | -       | 565905 172639 |
| 75     | <b>Fuel Station Entries</b><br>Name: Valley Drive Service Station<br>Location: Valley Drive , , Gravesend, Kent, DA12 5RT<br>Brand: Obsolete<br>Premises Type: Not Applicable<br>Status: Obsolete<br>Positional Accuracy: Located by supplier to within 100m                                 | A14NE (E)                              | 955                          | -       | 565890 172590 |
| 76     | <b>Points of Interest - Commercial Services</b><br>Name: Warner & Barker Shipping Services<br>Location: 26 Aintree Close, Gravesend, DA12 5AS<br>Category: Transport, Storage and Delivery<br>Class Code: Distribution and Haulage<br>Positional Accuracy: Positioned to address or location | A13SW (SW)                             | 114                          | 9       | 564817 172283 |
| 77     | <b>Points of Interest - Commercial Services</b><br>Name: Sound & Secure<br>Location: 61 Kings Drive, Gravesend, DA12 5BQ<br>Category: Repair and Servicing<br>Class Code: Vehicle Repair, Testing and Servicing<br>Positional Accuracy: Positioned to address or location                    | A13SE (S)                              | 262                          | 9       | 564948 172112 |
| 77     | <b>Points of Interest - Commercial Services</b><br>Name: Sound & Secure<br>Location: 61 Kings Drive, Gravesend, DA12 5BQ<br>Category: Repair and Servicing<br>Class Code: Vehicle Repair, Testing and Servicing<br>Positional Accuracy: Positioned to address or location                    | A13SE (S)                              | 262                          | 9       | 564948 172112 |
| 78     | <b>Points of Interest - Commercial Services</b><br>Name: Thomas Auto Electrics<br>Location: 16 Kings Drive, Gravesend, DA12 5BG<br>Category: Repair and Servicing<br>Class Code: Vehicle Repair, Testing and Servicing<br>Positional Accuracy: Positioned to address or location             | A13SE (SE)                             | 300                          | 9       | 565136 172142 |
| 78     | <b>Points of Interest - Commercial Services</b><br>Name: Thomas Auto Electrics<br>Location: 16 Kings Drive, Gravesend, DA12 5BG<br>Category: Repair and Servicing<br>Class Code: Vehicle Repair, Testing and Servicing<br>Positional Accuracy: Positioned to address or location             | A13SE (SE)                             | 300                          | 9       | 565136 172141 |
| 79     | <b>Points of Interest - Commercial Services</b><br>Name: Millennium Windscreens<br>Location: 4 Kitchener Avenue, Gravesend, DA12 5HY<br>Category: Repair and Servicing<br>Class Code: Vehicle Repair, Testing and Servicing<br>Positional Accuracy: Positioned to address or location        | A14NW (E)                              | 320                          | 9       | 565273 172440 |

| Map ID | Details                                                                                                                                                                                                                                                                                              | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR           |
|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|------------------------------|---------|---------------|
| 79     | <b>Points of Interest - Commercial Services</b><br>Name: Millennium Windscreens<br>Location: 4 Kitchener Avenue, Gravesend, DA12 5HY<br>Category: Repair and Servicing<br>Class Code: Vehicle Repair, Testing and Servicing<br>Positional Accuracy: Positioned to address or location                | A14NW (E)                              | 320                          | 9       | 565273 172440 |
| 79     | <b>Points of Interest - Commercial Services</b><br>Name: K's Moblie Garage Car & Van Mechanic<br>Location: 11 Kitchener Avenue, Gravesend, DA12 5HY<br>Category: Repair and Servicing<br>Class Code: Vehicle Repair, Testing and Servicing<br>Positional Accuracy: Positioned to address or location | A14SW (E)                              | 328                          | 9       | 565286 172369 |
| 80     | <b>Points of Interest - Commercial Services</b><br>Name: Bobs Autos<br>Location: 74 Singlewell Road, Gravesend, DA11 7PT<br>Category: Repair and Servicing<br>Class Code: Vehicle Repair, Testing and Servicing<br>Positional Accuracy: Positioned to address or location                            | A18SW (N)                              | 414                          | 9       | 564756 172826 |
| 80     | <b>Points of Interest - Commercial Services</b><br>Name: Green Flag<br>Location: 74 Singlewell Road, Gravesend, DA11 7PT<br>Category: Repair and Servicing<br>Class Code: Vehicle Repair, Testing and Servicing<br>Positional Accuracy: Positioned to address or location                            | A18SW (N)                              | 414                          | 9       | 564756 172826 |
| 80     | <b>Points of Interest - Commercial Services</b><br>Name: Bobs Autos<br>Location: 74 Singlewell Road, Gravesend, DA11 7PT<br>Category: Repair and Servicing<br>Class Code: Vehicle Repair, Testing and Servicing<br>Positional Accuracy: Positioned to address or location                            | A18SW (N)                              | 414                          | 9       | 564756 172826 |
| 80     | <b>Points of Interest - Commercial Services</b><br>Name: Mr Clutch Autocentres<br>Location: 50 Singlewell Road, Gravesend, DA11 7PW<br>Category: Repair and Servicing<br>Class Code: Vehicle Repair, Testing and Servicing<br>Positional Accuracy: Positioned to address or location                 | A18SW (N)                              | 476                          | 9       | 564779 172897 |
| 80     | <b>Points of Interest - Commercial Services</b><br>Name: W R M C<br>Location: 50 Singlewell Road, Gravesend, DA11 7PW<br>Category: Repair and Servicing<br>Class Code: Vehicle Repair, Testing and Servicing<br>Positional Accuracy: Positioned to address or location                               | A18SW (N)                              | 477                          | 9       | 564779 172897 |
| 80     | <b>Points of Interest - Commercial Services</b><br>Name: W R M C<br>Location: 50 Singlewell Road, Gravesend, DA11 7PW<br>Category: Repair and Servicing<br>Class Code: Vehicle Repair, Testing and Servicing<br>Positional Accuracy: Positioned to address or location                               | A18SW (N)                              | 477                          | 9       | 564779 172897 |
| 81     | <b>Points of Interest - Commercial Services</b><br>Name: Bed Bugs Solutions<br>Location: 27 Queens Road, Gravesend, DA12 5JP<br>Category: Contract Services<br>Class Code: Pest and Vermin Control<br>Positional Accuracy: Positioned to address or location                                         | A14SW (SE)                             | 442                          | 9       | 565325 172136 |
| 82     | <b>Points of Interest - Commercial Services</b><br>Name: John Beeney<br>Location: 78 Portland Avenue, Gravesend, DA12 5HF<br>Category: Recycling Services<br>Class Code: Scrap Metal Merchants<br>Positional Accuracy: Positioned to address or location                                             | A18SE (NE)                             | 465                          | 9       | 565141 172862 |
| 83     | <b>Points of Interest - Commercial Services</b><br>Name: A C M Autos<br>Location: 1A Coombe Road, Gravesend, DA12 5PB<br>Category: Repair and Servicing<br>Class Code: Vehicle Repair, Testing and Servicing<br>Positional Accuracy: Positioned to address or location                               | A19SW (NE)                             | 512                          | 9       | 565299 172809 |
| 84     | <b>Points of Interest - Commercial Services</b><br>Name: Direct Pest Solutions Ltd<br>Location: 54 Trosley Avenue, Gravesend, DA11 7QW<br>Category: Contract Services<br>Class Code: Pest and Vermin Control<br>Positional Accuracy: Positioned to address or location                               | A17SE (NW)                             | 644                          | 9       | 564553 172982 |

| Map ID | Details                                                                                                                                                                                                                                                                                         | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR           |
|--------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|------------------------------|---------|---------------|
| 85     | <b>Points of Interest - Commercial Services</b><br>Name: Performance 1st Ltd<br>Location: 28 Ash Road, Gravesend, DA12 5LN<br>Category: Repair and Servicing<br>Class Code: Vehicle Repair, Testing and Servicing<br>Positional Accuracy: Positioned to address or location                     | A9NW (SE)                              | 650                          | 9       | 565344 171860 |
| 86     | <b>Points of Interest - Commercial Services</b><br>Name: Hi-shine<br>Location: 108 Truro Road, Gravesend, DA12 5RF<br>Category: Personal, Consumer and other Services<br>Class Code: Vehicle Cleaning Services<br>Positional Accuracy: Positioned to address or location                        | A9NE (SE)                              | 853                          | 9       | 565709 171979 |
| 86     | <b>Points of Interest - Commercial Services</b><br>Name: Lellers<br>Location: 108 Truro Road, Gravesend, DA12 5RF<br>Category: Personal, Consumer and other Services<br>Class Code: Vehicle Cleaning Services<br>Positional Accuracy: Positioned to address or location                         | A9NE (SE)                              | 853                          | 9       | 565710 171980 |
| 86     | <b>Points of Interest - Commercial Services</b><br>Name: Lellers<br>Location: 108 Truro Road, Gravesend, DA12 5RF<br>Category: Personal, Consumer and other Services<br>Class Code: Vehicle Cleaning Services<br>Positional Accuracy: Positioned to address or location                         | A9NE (SE)                              | 853                          | 9       | 565710 171980 |
| 87     | <b>Points of Interest - Commercial Services</b><br>Name: Biggs Pest Damp & Timber Solutions<br>Location: 85 Taunton Vale, Gravesend, DA12 5QZ<br>Category: Contract Services<br>Class Code: Pest and Vermin Control<br>Positional Accuracy: Positioned to address or location                   | A14SE (E)                              | 861                          | 9       | 565788 172155 |
| 88     | <b>Points of Interest - Commercial Services</b><br>Name: Greenline Transport Ltd<br>Location: 2 The Sandpipers, Gravesend, DA12 5QB<br>Category: Transport, Storage and Delivery<br>Class Code: Distribution and Haulage<br>Positional Accuracy: Positioned to address or location              | A19SE (NE)                             | 975                          | 9       | 565826 172858 |
| 89     | <b>Points of Interest - Commercial Services</b><br>Name: T W Mobile Mechanic<br>Location: 2 Belle Vue Place, Shrubby Road, Gravesend, DA12 1JW<br>Category: Repair and Servicing<br>Class Code: Vehicle Repair, Testing and Servicing<br>Positional Accuracy: Positioned to address or location | A23SE (N)                              | 988                          | 9       | 565056 173422 |
| 90     | <b>Points of Interest - Manufacturing and Production</b><br>Name: Tank<br>Location: DA12<br>Category: Industrial Features<br>Class Code: Tanks (Generic)<br>Positional Accuracy: Positioned to an adjacent address or location                                                                  | A18NE (N)                              | 789                          | 9       | 565055 173221 |
| 91     | <b>Points of Interest - Public Infrastructure</b><br>Name: Rubbish 2 Go<br>Location: 62 The Fairway, Gravesend, DA11 7LW<br>Category: Infrastructure and Facilities<br>Class Code: Waste Storage, Processing and Disposal<br>Positional Accuracy: Positioned to address or location             | A12NE (W)                              | 440                          | 9       | 564462 172544 |
| 92     | <b>Points of Interest - Public Infrastructure</b><br>Name: Dashwood Garden of Rest<br>Location: Not Supplied<br>Category: Infrastructure and Facilities<br>Class Code: Cemeteries and Crematoria<br>Positional Accuracy: Positioned to an adjacent address or location                          | A17SW (NW)                             | 978                          | 9       | 564027 172896 |
| 92     | <b>Points of Interest - Public Infrastructure</b><br>Name: Dashwood Garden of Rest<br>Location: DA11<br>Category: Infrastructure and Facilities<br>Class Code: Cemeteries and Crematoria<br>Positional Accuracy: Positioned to an adjacent address or location                                  | A17SW (NW)                             | 978                          | 9       | 564027 172896 |
| 92     | <b>Points of Interest - Public Infrastructure</b><br>Name: Cemetery<br>Location: DA11<br>Category: Infrastructure and Facilities<br>Class Code: Cemeteries and Crematoria<br>Positional Accuracy: Positioned to an adjacent address or location                                                 | A17SW (NW)                             | 992                          | 9       | 564032 172934 |

| Map ID | Details                                                                                                                                                                                                                                        | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR           |
|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|------------------------------|---------|---------------|
| 93     | <b>Points of Interest - Recreational and Environmental</b><br>Name: Playground<br>Location: Not Supplied<br>Category: Recreational<br>Class Code: Playgrounds<br>Positional Accuracy: Positioned to an adjacent address or location            | A13SE (SE)                             | 27                           | 9       | 564951 172354 |
| 93     | <b>Points of Interest - Recreational and Environmental</b><br>Name: Playground<br>Location: Central Avenue, DA12<br>Category: Recreational<br>Class Code: Playgrounds<br>Positional Accuracy: Positioned to an adjacent address or location    | A13SE (SE)                             | 27                           | 9       | 564951 172354 |
| 94     | <b>Points of Interest - Recreational and Environmental</b><br>Name: Play Area<br>Location: DA12<br>Category: Recreational<br>Class Code: Playgrounds<br>Positional Accuracy: Positioned to an adjacent address or location                     | A8NE (S)                               | 617                          | 9       | 565110 171785 |
| 95     | <b>Points of Interest - Recreational and Environmental</b><br>Name: Playground<br>Location: Not Supplied<br>Category: Recreational<br>Class Code: Playgrounds<br>Positional Accuracy: Positioned to an adjacent address or location            | A17SE (NW)                             | 812                          | 9       | 564285 172976 |
| 95     | <b>Points of Interest - Recreational and Environmental</b><br>Name: Playground<br>Location: Lynton Road South, DA11<br>Category: Recreational<br>Class Code: Playgrounds<br>Positional Accuracy: Positioned to an adjacent address or location | A17SE (NW)                             | 812                          | 9       | 564285 172976 |
| 96     | <b>Points of Interest - Recreational and Environmental</b><br>Name: Playground<br>Location: Not Supplied<br>Category: Recreational<br>Class Code: Playgrounds<br>Positional Accuracy: Positioned to an adjacent address or location            | A14SE (E)                              | 848                          | 9       | 565803 172316 |
| 96     | <b>Points of Interest - Recreational and Environmental</b><br>Name: Playground<br>Location: Taunton Vale, DA12<br>Category: Recreational<br>Class Code: Playgrounds<br>Positional Accuracy: Positioned to an adjacent address or location      | A14SE (E)                              | 848                          | 9       | 565803 172317 |
| 97     | <b>Points of Interest - Recreational and Environmental</b><br>Name: Playground<br>Location: DA12<br>Category: Recreational<br>Class Code: Playgrounds<br>Positional Accuracy: Positioned to an adjacent address or location                    | A18NW (N)                              | 851                          | 9       | 564882 173289 |
| 98     | <b>Points of Interest - Recreational and Environmental</b><br>Name: Playground<br>Location: Beckett Mews, DA12<br>Category: Recreational<br>Class Code: Playgrounds<br>Positional Accuracy: Positioned to address or location                  | A9SW (SE)                              | 884                          | 9       | 565542 171719 |
| 98     | <b>Points of Interest - Recreational and Environmental</b><br>Name: Play Area<br>Location: DA12<br>Category: Recreational<br>Class Code: Playgrounds<br>Positional Accuracy: Positioned to an adjacent address or location                     | A9SW (SE)                              | 909                          | 9       | 565503 171655 |

| Agency & Hydrological                                                                                                                                                                                                                                                                                                                                                                    | Version                                                                           | Update Cycle                                                                                                       |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------|
| <b>Contaminated Land Register Entries and Notices</b><br>Environment Agency - Head Office<br>Thurrock Borough Council - Environmental Health Department<br>Dartford Borough Council - Environmental Health Department<br>Gravesham Borough Council - Public Health Services<br>Sevenoaks District Council - Environmental Health Department                                              | June 2020<br>November 2013<br>October 2014<br>September 2013<br>September 2013    | Annually<br>Annually<br>Annual Rolling Update<br>Annual Rolling Update<br>Annual Rolling Update                    |
| <b>Discharge Consents</b><br>Environment Agency - Anglian Region<br>Environment Agency - Southern Region<br>Environment Agency - Thames Region                                                                                                                                                                                                                                           | October 2020<br>October 2020<br>October 2020                                      | Quarterly<br>Quarterly<br>Quarterly                                                                                |
| <b>Enforcement and Prohibition Notices</b><br>Environment Agency - Anglian Region<br>Environment Agency - Southern Region                                                                                                                                                                                                                                                                | March 2013<br>March 2013                                                          | Annual Rolling Update<br>Annual Rolling Update                                                                     |
| <b>Integrated Pollution Controls</b><br>Environment Agency - Anglian Region<br>Environment Agency - Southern Region                                                                                                                                                                                                                                                                      | October 2008<br>October 2008                                                      | Variable<br>Variable                                                                                               |
| <b>Integrated Pollution Prevention And Control</b><br>Environment Agency - Anglian Region<br>Environment Agency - South East Region - Kent & South London Area<br>Environment Agency - Southern Region                                                                                                                                                                                   | October 2020<br>October 2020<br>October 2020                                      | Quarterly<br>Quarterly<br>Quarterly                                                                                |
| <b>Local Authority Integrated Pollution Prevention And Control</b><br>Thurrock Borough Council - Environmental Health Department<br>Gravesham Borough Council - Environmental Health Department<br>London Port Health Authority - Environmental Services<br>Dartford Borough Council - Environmental Health Department<br>Sevenoaks District Council - Environmental Health Department   | February 2015<br>October 2014<br>October 2014<br>September 2014<br>September 2014 | Variable<br>Variable<br>Variable<br>Variable<br>Variable                                                           |
| <b>Local Authority Pollution Prevention and Controls</b><br>Thurrock Borough Council - Environmental Health Department<br>Gravesham Borough Council - Environmental Health Department<br>London Port Health Authority - Environmental Services<br>Dartford Borough Council - Environmental Health Department<br>Sevenoaks District Council - Environmental Health Department             | February 2015<br>October 2014<br>October 2014<br>September 2014<br>September 2014 | Not Applicable<br>Annual Rolling Update<br>Annual Rolling Update<br>Annual Rolling Update<br>Annual Rolling Update |
| <b>Local Authority Pollution Prevention and Control Enforcements</b><br>Thurrock Borough Council - Environmental Health Department<br>Gravesham Borough Council - Environmental Health Department<br>London Port Health Authority - Environmental Services<br>Dartford Borough Council - Environmental Health Department<br>Sevenoaks District Council - Environmental Health Department | February 2015<br>October 2014<br>October 2014<br>September 2014<br>September 2014 | Variable<br>Variable<br>Variable<br>Variable<br>Variable                                                           |
| <b>Nearest Surface Water Feature</b><br>Ordnance Survey                                                                                                                                                                                                                                                                                                                                  | October 2020                                                                      |                                                                                                                    |
| <b>Pollution Incidents to Controlled Waters</b><br>Environment Agency - Southern Region<br>Environment Agency - Anglian Region                                                                                                                                                                                                                                                           | December 1999<br>September 1999                                                   | Not Applicable<br>Not Applicable                                                                                   |
| <b>Prosecutions Relating to Authorised Processes</b><br>Environment Agency - Anglian Region<br>Environment Agency - Southern Region                                                                                                                                                                                                                                                      | March 2013<br>March 2013                                                          | Annual Rolling Update<br>Annual Rolling Update                                                                     |
| <b>Prosecutions Relating to Controlled Waters</b><br>Environment Agency - Anglian Region<br>Environment Agency - Southern Region                                                                                                                                                                                                                                                         | March 2013<br>March 2013                                                          | Annual Rolling Update<br>Annual Rolling Update                                                                     |
| <b>Registered Radioactive Substances</b><br>Environment Agency - Anglian Region<br>Environment Agency - Southern Region                                                                                                                                                                                                                                                                  | June 2016<br>June 2016                                                            |                                                                                                                    |
| <b>River Quality</b><br>Environment Agency - Head Office                                                                                                                                                                                                                                                                                                                                 | November 2001                                                                     | Not Applicable                                                                                                     |

| Agency & Hydrological                                                                                                                                                                                                                                                                          | Version                                                      | Update Cycle                                     |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|--------------------------------------------------|
| <b>River Quality Biology Sampling Points</b><br>Environment Agency - Head Office                                                                                                                                                                                                               | July 2012                                                    | Annually                                         |
| <b>River Quality Chemistry Sampling Points</b><br>Environment Agency - Head Office                                                                                                                                                                                                             | July 2012                                                    | Annually                                         |
| <b>Substantiated Pollution Incident Register</b><br>Environment Agency - Anglian Region - Eastern Area<br>Environment Agency - South East Region - Kent & South London Area<br>Environment Agency - Southern Region - Kent Area<br>Environment Agency - Southern Region - Kent and East Sussex | October 2020<br>October 2020<br>October 2020<br>October 2020 | Quarterly<br>Quarterly<br>Quarterly<br>Quarterly |
| <b>Water Abstractions</b><br>Environment Agency - Anglian Region<br>Environment Agency - Southern Region                                                                                                                                                                                       | January 2021<br>January 2021                                 | Quarterly<br>Quarterly                           |
| <b>Water Industry Act Referrals</b><br>Environment Agency - Anglian Region<br>Environment Agency - Southern Region                                                                                                                                                                             | October 2017<br>October 2017                                 | Quarterly<br>Quarterly                           |
| <b>Groundwater Vulnerability Map</b><br>Environment Agency - Head Office                                                                                                                                                                                                                       | June 2018                                                    | As notified                                      |
| <b>Groundwater Vulnerability - Soluble Rock Risk</b><br>Environment Agency - Head Office                                                                                                                                                                                                       | June 2018                                                    | As notified                                      |
| <b>Bedrock Aquifer Designations</b><br>Environment Agency - Head Office                                                                                                                                                                                                                        | January 2018                                                 | Annually                                         |
| <b>Superficial Aquifer Designations</b><br>Environment Agency - Head Office                                                                                                                                                                                                                    | January 2018                                                 | Annually                                         |
| <b>Source Protection Zones</b><br>Environment Agency - Head Office                                                                                                                                                                                                                             | October 2019                                                 | Quarterly                                        |
| <b>Extreme Flooding from Rivers or Sea without Defences</b><br>Environment Agency - Head Office                                                                                                                                                                                                | September 2020                                               | Quarterly                                        |
| <b>Flooding from Rivers or Sea without Defences</b><br>Environment Agency - Head Office                                                                                                                                                                                                        | September 2020                                               | Quarterly                                        |
| <b>Areas Benefiting from Flood Defences</b><br>Environment Agency - Head Office                                                                                                                                                                                                                | September 2020                                               | Quarterly                                        |
| <b>Flood Water Storage Areas</b><br>Environment Agency - Head Office                                                                                                                                                                                                                           | September 2020                                               | Quarterly                                        |
| <b>Flood Defences</b><br>Environment Agency - Head Office                                                                                                                                                                                                                                      | September 2020                                               | Quarterly                                        |
| <b>OS Water Network Lines</b><br>Ordnance Survey                                                                                                                                                                                                                                               | September 2020                                               | Quarterly                                        |
| <b>Surface Water 1 in 30 year Flood Extent</b><br>Environment Agency - Head Office                                                                                                                                                                                                             | October 2013                                                 | Annually                                         |
| <b>Surface Water 1 in 100 year Flood Extent</b><br>Environment Agency - Head Office                                                                                                                                                                                                            | October 2013                                                 | Annually                                         |
| <b>Surface Water 1 in 1000 year Flood Extent</b><br>Environment Agency - Head Office                                                                                                                                                                                                           | October 2013                                                 | Annually                                         |
| <b>Surface Water Suitability</b><br>Environment Agency - Head Office                                                                                                                                                                                                                           | October 2013                                                 | Annually                                         |
| <b>BGS Groundwater Flooding Susceptibility</b><br>British Geological Survey - National Geoscience Information Service                                                                                                                                                                          | May 2013                                                     | Annually                                         |

| Waste                                                                                                                                                                                                                                                                                                           | Version                                                      | Update Cycle                                                                           |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|----------------------------------------------------------------------------------------|
| <b>BGS Recorded Landfill Sites</b><br>British Geological Survey - National Geoscience Information Service                                                                                                                                                                                                       | June 1996                                                    | Not Applicable                                                                         |
| <b>Historical Landfill Sites</b><br>Environment Agency - Head Office                                                                                                                                                                                                                                            | October 2019                                                 | Quarterly                                                                              |
| <b>Integrated Pollution Control Registered Waste Sites</b><br>Environment Agency - Anglian Region<br>Environment Agency - Southern Region                                                                                                                                                                       | October 2008<br>October 2008                                 | Not Applicable<br>Not Applicable                                                       |
| <b>Licensed Waste Management Facilities (Landfill Boundaries)</b><br>Environment Agency - Anglian Region - Eastern Area<br>Environment Agency - South East Region - Kent & South London Area<br>Environment Agency - Southern Region - Kent Area<br>Environment Agency - Southern Region - Kent and East Sussex | October 2020<br>October 2020<br>October 2020<br>October 2020 | Quarterly<br>Quarterly<br>Quarterly<br>Quarterly                                       |
| <b>Licensed Waste Management Facilities (Locations)</b><br>Environment Agency - Anglian Region - Eastern Area<br>Environment Agency - South East Region - Kent & South London Area<br>Environment Agency - Southern Region - Kent Area<br>Environment Agency - Southern Region - Kent and East Sussex           | October 2020<br>October 2020<br>October 2020<br>October 2020 | Quarterly<br>Quarterly<br>Quarterly<br>Quarterly                                       |
| <b>Local Authority Landfill Coverage</b><br>Dartford Borough Council - Environmental Health Department<br>Gravesham Borough Council<br>Kent County Council - Waste Management Group<br>Sevenoaks District Council<br>Thurrock Borough Council - Environmental Health Department                                 | May 2000<br>May 2000<br>May 2000<br>May 2000<br>May 2000     | Not Applicable<br>Not Applicable<br>Not Applicable<br>Not Applicable<br>Not Applicable |
| <b>Local Authority Recorded Landfill Sites</b><br>Dartford Borough Council - Environmental Health Department<br>Gravesham Borough Council<br>Kent County Council - Waste Management Group<br>Sevenoaks District Council<br>Thurrock Borough Council - Environmental Health Department                           | May 2000<br>May 2000<br>May 2000<br>May 2000<br>May 2000     | Not Applicable<br>Not Applicable<br>Not Applicable<br>Not Applicable<br>Not Applicable |
| <b>Potentially Infilled Land (Non-Water)</b><br>Landmark Information Group Limited                                                                                                                                                                                                                              | December 1999                                                | Not Applicable                                                                         |
| <b>Potentially Infilled Land (Water)</b><br>Landmark Information Group Limited                                                                                                                                                                                                                                  | December 1999                                                | Not Applicable                                                                         |
| <b>Registered Landfill Sites</b><br>Environment Agency - Anglian Region - Eastern Area<br>Environment Agency - Southern Region - Kent Area<br>Environment Agency - Southern Region - Kent and East Sussex                                                                                                       | March 2003<br>March 2003<br>March 2003                       | Not Applicable<br>Not Applicable<br>Not Applicable                                     |
| <b>Registered Waste Transfer Sites</b><br>Environment Agency - Anglian Region - Eastern Area<br>Environment Agency - Southern Region - Kent Area<br>Environment Agency - Southern Region - Kent and East Sussex                                                                                                 | March 2003<br>March 2003<br>March 2003                       | Not Applicable<br>Not Applicable<br>Not Applicable                                     |
| <b>Registered Waste Treatment or Disposal Sites</b><br>Environment Agency - Anglian Region - Eastern Area<br>Environment Agency - Southern Region - Kent Area<br>Environment Agency - Southern Region - Kent and East Sussex                                                                                    | March 2003<br>March 2003<br>March 2003                       | Not Applicable<br>Not Applicable<br>Not Applicable                                     |

| Hazardous Substances                                                                                                                                                                                                                                                      | Version                                                                                        | Update Cycle                                                                      |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
| <b>Control of Major Accident Hazards Sites (COMAH)</b><br>Health and Safety Executive                                                                                                                                                                                     | April 2018                                                                                     | Bi-Annually                                                                       |
| <b>Explosive Sites</b><br>Health and Safety Executive                                                                                                                                                                                                                     | March 2017                                                                                     | Annually                                                                          |
| <b>Notification of Installations Handling Hazardous Substances (NIHS)</b><br>Health and Safety Executive                                                                                                                                                                  | November 2000                                                                                  | Not Applicable                                                                    |
| <b>Planning Hazardous Substance Enforcements</b><br>Thurrock Borough Council - Development Control<br>Sevenoaks District Council<br>London Port Health Authority - Environmental Services<br>Dartford Borough Council<br>Kent County Council<br>Gravesham Borough Council | December 2015<br>February 2016<br>January 2008<br>January 2016<br>January 2016<br>October 2015 | Variable<br>Variable<br>Annual Rolling Update<br>Variable<br>Variable<br>Variable |
| <b>Planning Hazardous Substance Consents</b><br>Thurrock Borough Council - Development Control<br>Sevenoaks District Council<br>London Port Health Authority - Environmental Services<br>Dartford Borough Council<br>Kent County Council<br>Gravesham Borough Council     | December 2015<br>February 2016<br>January 2008<br>January 2016<br>January 2016<br>October 2015 | Variable<br>Variable<br>Annual Rolling Update<br>Variable<br>Variable<br>Variable |
| Geological                                                                                                                                                                                                                                                                | Version                                                                                        | Update Cycle                                                                      |
| <b>BGS 1:625,000 Solid Geology</b><br>British Geological Survey - National Geoscience Information Service                                                                                                                                                                 | January 2009                                                                                   | Not Applicable                                                                    |
| <b>BGS Estimated Soil Chemistry</b><br>British Geological Survey - National Geoscience Information Service                                                                                                                                                                | October 2015                                                                                   | Annually                                                                          |
| <b>BGS Recorded Mineral Sites</b><br>British Geological Survey - National Geoscience Information Service                                                                                                                                                                  | November 2020                                                                                  | Bi-Annually                                                                       |
| <b>CBSCB Compensation District</b><br>Cheshire Brine Subsidence Compensation Board (CBSCB)                                                                                                                                                                                | August 2011                                                                                    | Not Applicable                                                                    |
| <b>Coal Mining Affected Areas</b><br>The Coal Authority - Property Searches                                                                                                                                                                                               | March 2014                                                                                     | Annual Rolling Update                                                             |
| <b>Mining Instability</b><br>Ove Arup & Partners                                                                                                                                                                                                                          | October 2000                                                                                   | Not Applicable                                                                    |
| <b>Non Coal Mining Areas of Great Britain</b><br>British Geological Survey - National Geoscience Information Service                                                                                                                                                      | May 2015                                                                                       | Not Applicable                                                                    |
| <b>Potential for Collapsible Ground Stability Hazards</b><br>British Geological Survey - National Geoscience Information Service                                                                                                                                          | April 2020                                                                                     | Annually                                                                          |
| <b>Potential for Compressible Ground Stability Hazards</b><br>British Geological Survey - National Geoscience Information Service                                                                                                                                         | January 2019                                                                                   | Annually                                                                          |
| <b>Potential for Ground Dissolution Stability Hazards</b><br>British Geological Survey - National Geoscience Information Service                                                                                                                                          | January 2019                                                                                   | Annually                                                                          |
| <b>Potential for Landslide Ground Stability Hazards</b><br>British Geological Survey - National Geoscience Information Service                                                                                                                                            | January 2019                                                                                   | Annually                                                                          |
| <b>Potential for Running Sand Ground Stability Hazards</b><br>British Geological Survey - National Geoscience Information Service                                                                                                                                         | January 2019                                                                                   | Annually                                                                          |
| <b>Potential for Shrinking or Swelling Clay Ground Stability Hazards</b><br>British Geological Survey - National Geoscience Information Service                                                                                                                           | January 2019                                                                                   | Annually                                                                          |
| <b>Radon Potential - Radon Affected Areas</b><br>British Geological Survey - National Geoscience Information Service                                                                                                                                                      | July 2011                                                                                      | Annually                                                                          |
| <b>Radon Potential - Radon Protection Measures</b><br>British Geological Survey - National Geoscience Information Service                                                                                                                                                 | July 2011                                                                                      | Annually                                                                          |

| Industrial Land Use                                                  | Version        | Update Cycle |
|----------------------------------------------------------------------|----------------|--------------|
| <b>Contemporary Trade Directory Entries</b><br>Thomson Directories   | October 2020   | Quarterly    |
| <b>Fuel Station Entries</b><br>Catalist Ltd - Experian               | September 2020 | Quarterly    |
| <b>Gas Pipelines</b><br>National Grid                                | January 2021   |              |
| <b>Points of Interest - Commercial Services</b><br>PointX            | December 2020  | Quarterly    |
| <b>Points of Interest - Education and Health</b><br>PointX           | December 2020  | Quarterly    |
| <b>Points of Interest - Manufacturing and Production</b><br>PointX   | December 2020  | Quarterly    |
| <b>Points of Interest - Public Infrastructure</b><br>PointX          | December 2020  | Quarterly    |
| <b>Points of Interest - Recreational and Environmental</b><br>PointX | December 2020  | Quarterly    |
| <b>Underground Electrical Cables</b><br>National Grid                | August 2020    |              |

| Sensitive Land Use                                                                                                                                                            | Version                                          | Update Cycle                                             |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------|----------------------------------------------------------|
| <b>Ancient Woodland</b><br>Natural England                                                                                                                                    | April 2020                                       | Bi-Annually                                              |
| <b>Areas of Adopted Green Belt</b><br>Dartford Borough Council<br>Gravesham Borough Council<br>Sevenoaks District Council<br>Thurrock Borough Council - Development Control   | June 2020<br>June 2020<br>June 2020<br>June 2020 | As notified<br>As notified<br>As notified<br>As notified |
| <b>Areas of Unadopted Green Belt</b><br>Dartford Borough Council<br>Gravesham Borough Council<br>Sevenoaks District Council<br>Thurrock Borough Council - Development Control | June 2020<br>June 2020<br>June 2020<br>June 2020 | As notified<br>As notified<br>As notified<br>As notified |
| <b>Areas of Outstanding Natural Beauty</b><br>Natural England                                                                                                                 | January 2021                                     | Bi-Annually                                              |
| <b>Environmentally Sensitive Areas</b><br>Natural England                                                                                                                     | January 2017                                     |                                                          |
| <b>Forest Parks</b><br>Forestry Commission                                                                                                                                    | April 1997                                       | Not Applicable                                           |
| <b>Local Nature Reserves</b><br>Natural England                                                                                                                               | April 2020                                       | Bi-Annually                                              |
| <b>Marine Nature Reserves</b><br>Natural England                                                                                                                              | July 2019                                        | Bi-Annually                                              |
| <b>National Nature Reserves</b><br>Natural England                                                                                                                            | January 2021                                     | Bi-Annually                                              |
| <b>National Parks</b><br>Natural England                                                                                                                                      | April 2017                                       | Bi-Annually                                              |
| <b>Nitrate Sensitive Areas</b><br>Natural England                                                                                                                             | April 2016                                       | Not Applicable                                           |
| <b>Nitrate Vulnerable Zones</b><br>Environment Agency - Head Office<br>Department for Environment, Food and Rural Affairs (DEFRA - formerly FRCA)                             | December 2017<br>October 2015                    | Bi-Annually                                              |
| <b>Ramsar Sites</b><br>Natural England                                                                                                                                        | August 2020                                      | Bi-Annually                                              |
| <b>Sites of Special Scientific Interest</b><br>Natural England                                                                                                                | May 2020                                         | Bi-Annually                                              |
| <b>Special Areas of Conservation</b><br>Natural England                                                                                                                       | July 2020                                        | Bi-Annually                                              |
| <b>Special Protection Areas</b><br>Natural England                                                                                                                            | September 2020                                   | Bi-Annually                                              |

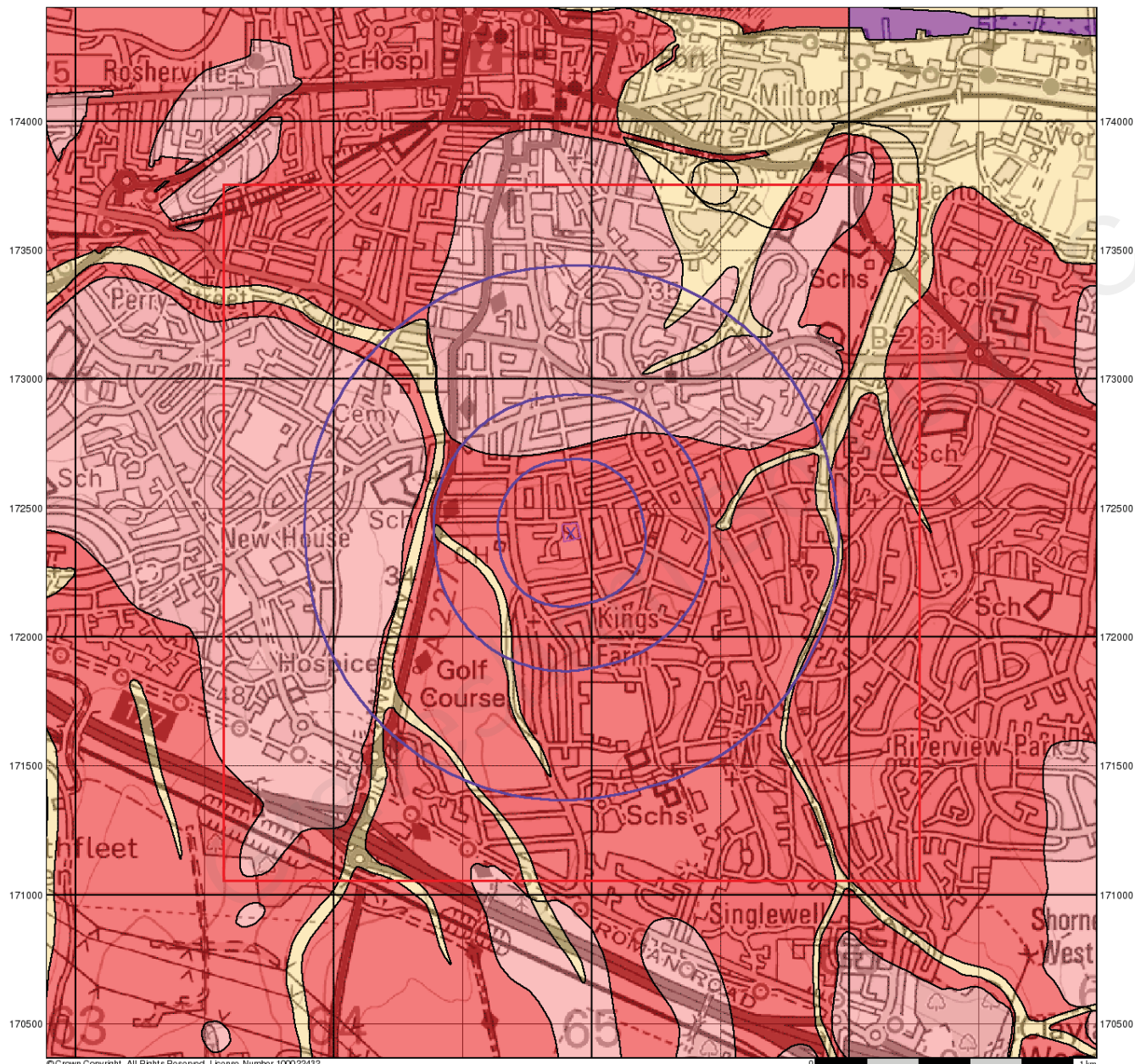
A selection of organisations who provide data within this report

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

| Contact | Name and Address                                                                                                                                                  | Contact Details                                                                                                                 |
|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|
| 1       | <b>British Geological Survey - Enquiry Service</b><br>British Geological Survey, Environmental Science Centre, Keyworth,<br>Nottingham, Nottinghamshire, NG12 5GG | Telephone: 0115 936 3143<br>Fax: 0115 936 3276<br>Email: enquiries@bgs.ac.uk<br>Website: www.bgs.ac.uk                          |
| 2       | <b>Environment Agency - National Customer Contact Centre (NCCC)</b><br>PO Box 544, Templeborough, Rotherham, S60 1BY                                              | Telephone: 03708 506 506<br>Email: enquiries@environment-agency.gov.uk                                                          |
| 3       | <b>Gravesham Borough Council - Environmental Health Department</b><br>Civic Centre, 132 Windmill Street, Gravesend, Kent, DA12 1AU                                | Telephone: 01474 337241<br>Fax: 01474 337546<br>Email: glyn.thomson@gravesham.gov.uk<br>Website: www.gravesham.gov.uk           |
| 4       | <b>Environment Agency - Head Office</b><br>Rio House, Waterside Drive, Aztec West, Almondsbury, Bristol, Avon,<br>BS32 4UD                                        | Telephone: 01454 624400<br>Fax: 01454 624409                                                                                    |
| 5       | <b>Ordnance Survey</b><br>Adanac Drive, Southampton, Hampshire, SO16 0AS                                                                                          | Telephone: 03456 05 05 05<br>Email: customerservices@ordnancesurvey.co.uk<br>Website: www.ordnancesurvey.gov.uk                 |
| 6       | <b>Gravesham Borough Council</b><br>Cygnet House, 132 Windmill Street, Gravesend, Kent, DA12 1AU                                                                  | Telephone: 01474 564422<br>Fax: 01474 337546<br>Website: www.gravesham.gov.uk                                                   |
| 7       | <b>Kent County Council - Waste Management Group</b><br>Block H, The Forstal, Beddow Way, Aylesford, Kent, ME20 7BT                                                | Telephone: 01622 605976<br>Website: www.kent.gov.uk                                                                             |
| 8       | <b>Stantec UK Ltd</b><br>Caversham Bridge House, Waterman Place, Reading, RG1 8DN                                                                                 | Telephone: 0118 950 0761<br>Email: pba.reading@stantec.com<br>Website: www.stantec.com                                          |
| 9       | <b>PointX</b><br>7 Abbey Court, Eagle Way, Sowton, Exeter, Devon, EX2 7HY                                                                                         | Website: www.pointx.co.uk                                                                                                       |
| 10      | <b>Natural England</b><br>County Hall, Spetchley Road, Worcester, WR5 2NP                                                                                         | Telephone: 0300 060 3900<br>Email: enquiries@naturalengland.org.uk<br>Website: www.naturalengland.org.uk                        |
| 11      | <b>Gravesham Borough Council</b><br>Cygnet House, 132 Windmill Street, Gravesend, Kent, DA12 1BQ                                                                  | Telephone: 01474 564422<br>Fax: 01474 337546<br>Website: www.gravesham.gov.uk                                                   |
| -       | <b>Public Health England - Radon Survey, Centre for Radiation, Chemical and Environmental Hazards</b><br>Chilton, Didcot, Oxfordshire, OX11 0RQ                   | Telephone: 01235 822622<br>Fax: 01235 833891<br>Email: radon@phe.gov.uk<br>Website: www.ukradon.org                             |
| -       | <b>Landmark Information Group Limited</b><br>Imperium, Imperial Way, Reading, Berkshire, RG2 0TD                                                                  | Telephone: 0844 844 9952<br>Fax: 0844 844 9951<br>Email: customerservices@landmarkinfo.co.uk<br>Website: www.landmarkinfo.co.uk |

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

563000 563500 564000 564500 565000 565500 566000 566500



© Crown Copyright. All Rights Reserved. License Number 100022432.

0 1 km

## Groundwater Vulnerability

### General

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

### Agency and Hydrological

#### Bedrock Aquifers

- High Vulnerability, Principal Aquifer
- High Vulnerability, Secondary Aquifer
- Medium Vulnerability, Principal Aquifer
- Medium Vulnerability, Secondary Aquifer
- Low Vulnerability, Principal Aquifer
- Low Vulnerability, Secondary Aquifer

#### Superficial Aquifers

- High Vulnerability, Principal Aquifer
- High Vulnerability, Secondary Aquifer
- Medium Vulnerability, Principal Aquifer
- Medium Vulnerability, Secondary Aquifer
- Low Vulnerability, Principal Aquifer
- Low Vulnerability, Secondary Aquifer

- Unproductive Aquifer
- Soluble Rock

### Site Sensitivity Context Map - Slice A

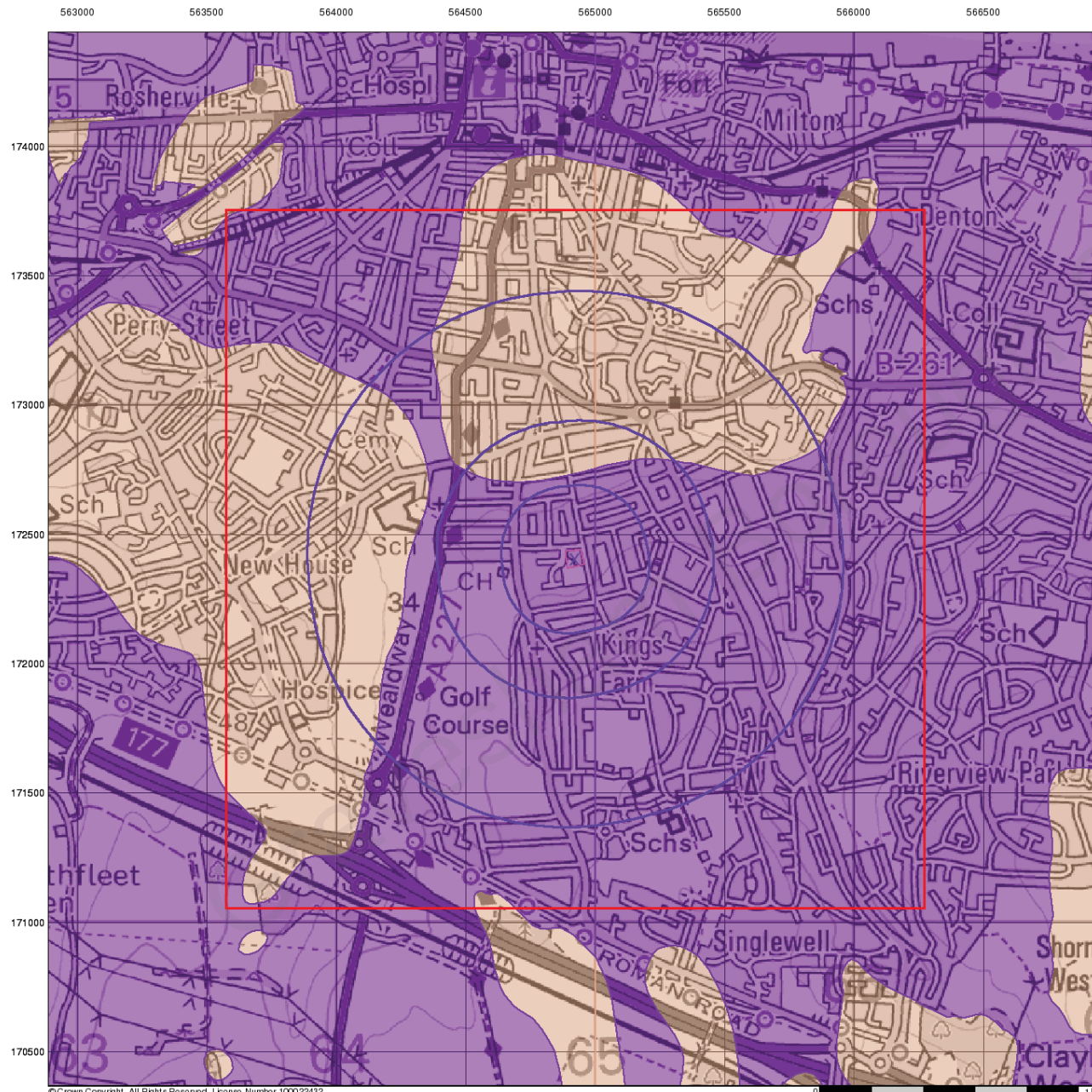


### Order Details

Order Number: 272544619\_1\_1  
 Customer Ref: 002-21-719  
 National Grid Reference: 564920, 172400  
 Slice: A  
 Site Area (Ha): 0.4  
 Search Buffer (m): 1000

### Site Details

Land at Central Avenue, GRAVESEND, DA12 5AW



© Crown Copyright. All Rights Reserved. License Number 100022432.

## Bedrock Aquifer Designation

### General

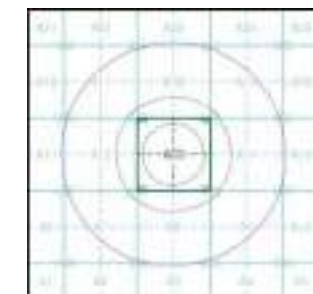
- Specified Site
- Specified Buffer(s)
- Bearing Reference Point
- Slice
- Map ID

### 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

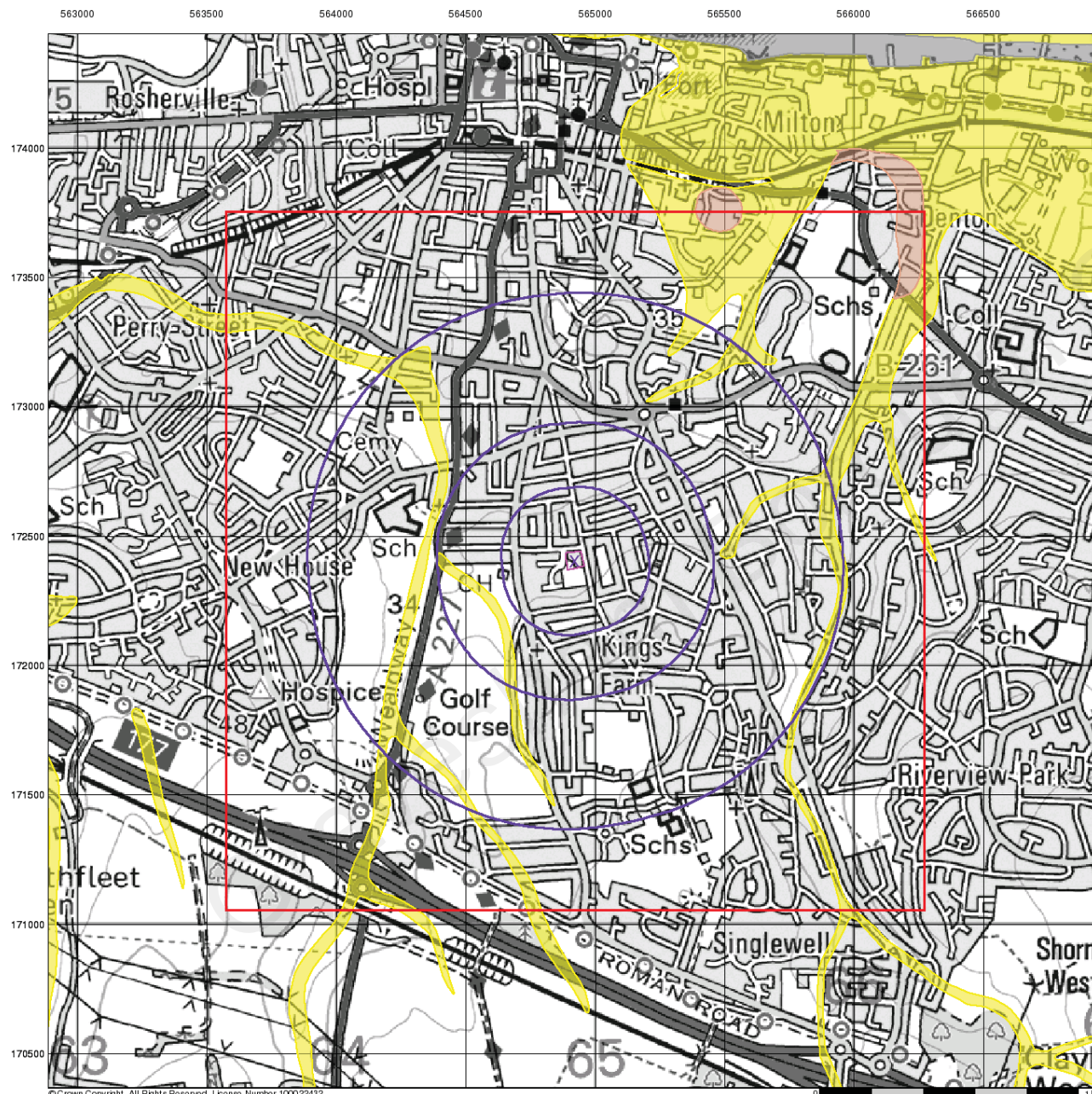


### Order Details

Order Number: 272544619\_1\_1  
 Customer Ref: 002-21-719  
 National Grid Reference: 564920, 172400  
 Slice: A  
 Site Area (Ha): 0.4  
 Search Buffer (m): 1000

### Site Details

Land at Central Avenue, GRAVESEND, DA12 5AW



© Crown Copyright. All Rights Reserved. License Number 100022432.

## Superficial Aquifer Designation

### General

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

Order Number: 272544619\_1\_1  
 Customer Ref: 002-21-719  
 National Grid Reference: 564920, 172400  
 Slice: A  
 Site Area (Ha): 0.4  
 Search Buffer (m): 1000

### Site Details

Land at Central Avenue, GRAVESEND, DA12 5AW

563000 563500 564000 564500 565000 565500 566000 566500



© Crown Copyright. All Rights Reserved. License Number 100022432.

## Source Protection Zones

### General

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

Order Number: 272544619\_1\_1  
 Customer Ref: 002-21-719  
 National Grid Reference: 564920, 172400  
 Slice: A  
 Site Area (Ha): 0.4  
 Search Buffer (m): 1000

### Site Details

Land at Central Avenue, GRAVESEND, DA12 5AW



© Crown Copyright. All Rights Reserved. License Number 100022432.

## Sensitive Land Uses

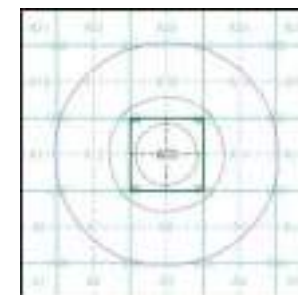
### General

- 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

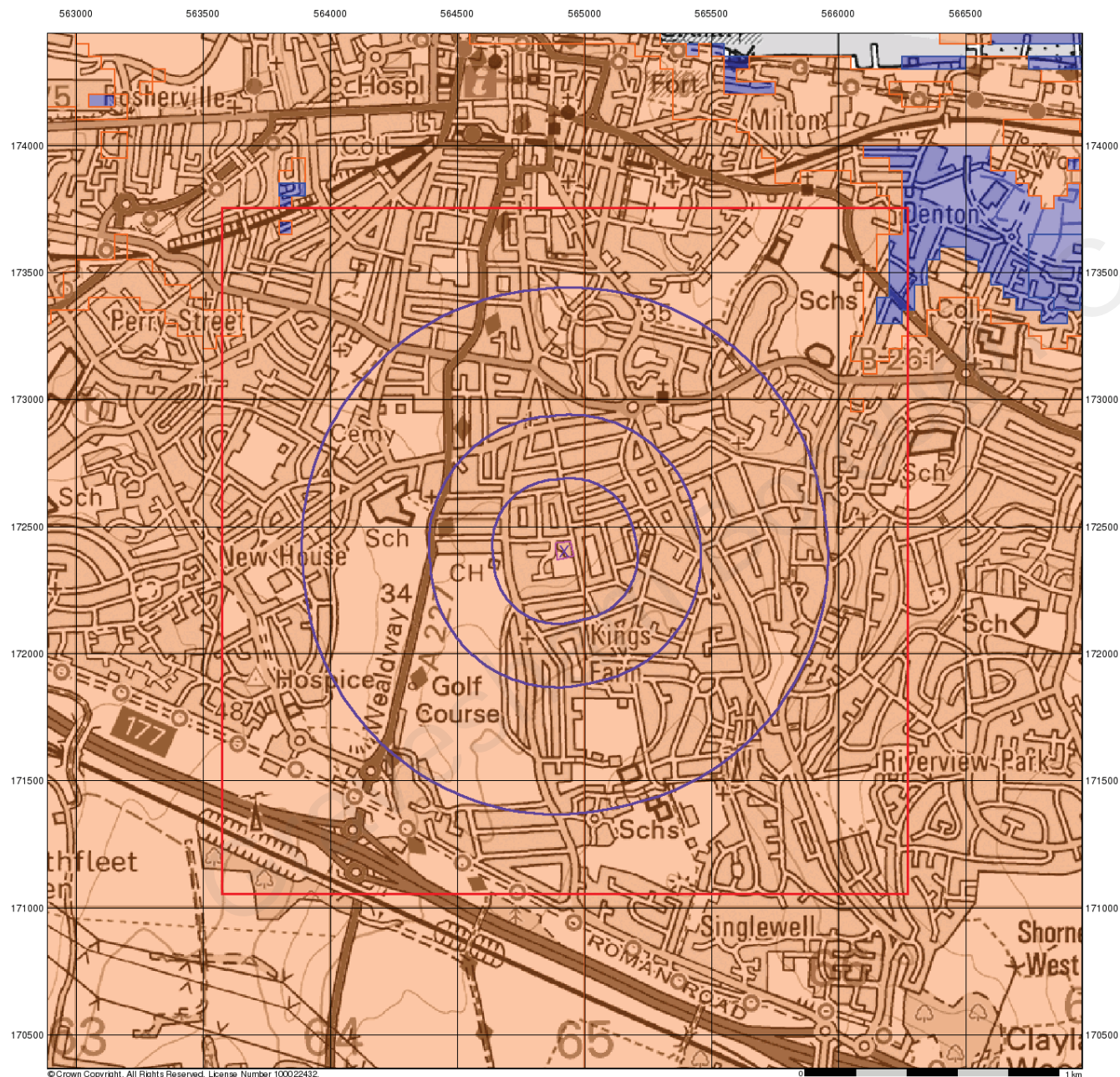


### Order Details

Order Number: 272544619\_1\_1  
 Customer Ref: 002-21-719  
 National Grid Reference: 564920, 172400  
 Slice: A  
 Site Area (Ha): 0.4  
 Search Buffer (m): 1000

### Site Details

Land at Central Avenue, GRAVESEND, DA12 5AW



# **Envirocheck** LANDMARK INFORMATION GROUP

## **BGS Flood GFS Data**

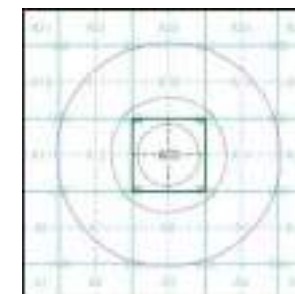
### **General**

- 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: 272544619\_1\_1  
 Customer Ref: 002-21-719  
 National Grid Reference: 564920, 172400  
 Slice: A  
 Site Area (Ha): 0.4  
 Search Buffer (m): 1000

## **Site Details**

Land at Central Avenue, GRAVESEND, DA12 5AW

**Landmark**  
 LANDMARK INFORMATION GROUP

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

## General

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

## Agency and Hydrological

- Contaminated Land Register Entry or Notice (Location)
- Contaminated Land Register Entry or Notice (Location)
- 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
- Prosecution Relating to Authorised Processes
- Prosecution Relating to Controlled Waters
- Registered Radioactive Substance
- River Network or Water Feature
- River Quality Sampling Point
- Substantiated Pollution Incident Register
- Water Abstraction
- Water Industry Act Referral

## Hazardous Substances

- COMAH Site
- Explosive Site
- NIHS Site
- Planning Hazardous Substance Consent
- Planning Hazardous Substance Enforcement
- BGS Recorded Mineral Site

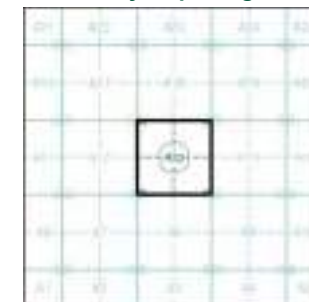
## Geological

- BGS Recorded Mineral Site

## Waste

- BOS Recorded Landfill Site (Location)
- BOS 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)
- Registered Landfill Site
- Registered Landfill Site (Location)
- 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

## Site Sensitivity Map - Segment A13



## Order Details

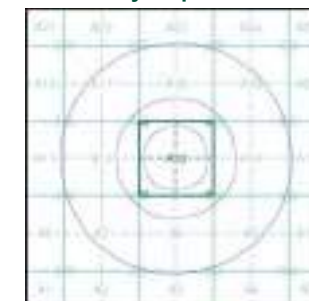
Order Number: 272544619\_1\_1  
 Customer Ref: 002-21-719  
 National Grid Reference: 564920, 172400  
 Slice: A  
 Site Area (Ha): 0.4  
 Plot Buffer (m): 100

## Site Details

Land at Central Avenue, GRAVESEND, DA12 5AW

- General**
- Specified Site
  - Specified Buffer(s)
  - Bearing Reference Point
  - Map ID
  - Several of Type at Location
- 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
  - Prosecution Relating to Authorised Processes
  - Prosecution Relating to Controlled Waters
  - Registered Radioactive Substance
  - River Network or Water Feature
  - River Quality Sampling Point
  - Substantiated Pollution Incident Register
  - Water Abstraction
  - Water Industry Act Referral
- Hazardous Substances**
- COMAH Site
  - Explosive Site
  - NIHIS Site
  - Planning Hazardous Substance Consent
  - Planning Hazardous Substance Enforcement
- Geological**
- BGS Recorded Mineral Site
- 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 (Water)
  - Potentially Infilled Land (Water)
  - Potentially Infilled Land (Water)
  - Registered Landfill Site
  - Registered Landfill Site (Location)
  - Registered Landfill Site (Point Buffered to 100m)
  - Registered Landfill Site (Point Buffered to 250m)
  - Registered Landfill Site (Location)
  - Registered Waste Transfer Site (Location)
  - Registered Waste Transfer Site
  - Registered Waste Treatment or Disposal Site (Location)
  - Registered Waste Treatment or Disposal Site

## Site Sensitivity Map - Slice A



## Order Details

Order Number: 272544619\_1\_1  
 Customer Ref: 002-21-719  
 National Grid Reference: 564920, 172400  
 Slice: A  
 Site Area (Ha): 0.4  
 Search Buffer (m): 1000

## Site Details

Land at Central Avenue, GRAVESEND, DA12 5AW

## Industrial Land Use Map

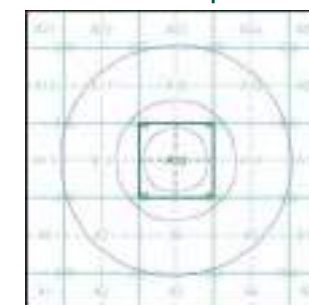
### General

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

### Industrial Land Use

- Contemporary Trade Directory Entry
- Fuel Station Entry
- Gas Pipeline
- 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: 272544619\_1\_1  
 Customer Ref: 002-21-719  
 National Grid Reference: 564920, 172400  
 Slice: A  
 Site Area (Ha): 0.4  
 Search Buffer (m): 1000

### Site Details

Land at Central Avenue, GRAVESEND, DA12 5AW

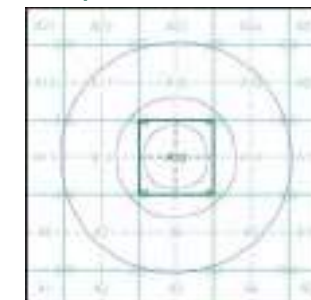
## General

- ◇ Specified Site
- Specified Buffer(s)
- X 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: 272544619\_1\_1  
 Customer Ref: 002-21-719  
 National Grid Reference: 564920, 172400  
 Slice: A  
 Site Area (Ha): 0.4  
 Search Buffer (m): 1000

## Site Details

Land at Central Avenue, GRAVESEND, DA12 5AW

## General

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

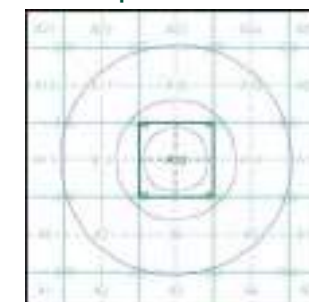
## Agency and Hydrological (Boreholes)

-  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](http://www.envirocheck.co.uk).

## Borehole Map - Slice A



## Order Details

Order Number: 272544619\_1\_1  
 Customer Ref: 002-21-719  
 National Grid Reference: 564920, 172400  
 Slice: A  
 Site Area (Ha): 0.4  
 Search Buffer (m): 1000

## Site Details

Land at Central Avenue, GRAVESEND, DA12 5AW

## General

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

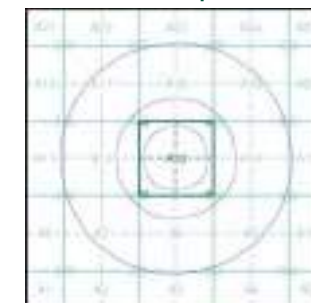
## OS Water Network Data

- |                                                                                                  |                                                                                                             |
|--------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|
|  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
-  Mean Low Water
-  Mean High Water

## OS Water Network Map - Slice A



## Order Details

Order Number: 272544619\_1\_1  
 Customer Ref: 002-21-719  
 National Grid Reference: 564920, 172400  
 Slice: A  
 Site Area (Ha): 0.4  
 Search Buffer (m): 1000

## Site Details

Land at Central Avenue, GRAVESEND, DA12 5AW

## General

- ◇ Specified Site
- Specified Buffer(s)
- X 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

## EA/NRW Suitability Map - Slice A



## Order Details

Order Number: 272544619\_1\_1  
 Customer Ref: 002-21-719  
 National Grid Reference: 564920, 172400  
 Slice: A  
 Site Area (Ha): 0.4  
 Search Buffer (m): 1000

## Site Details

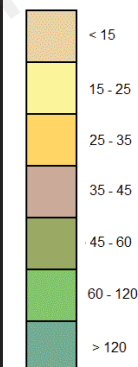
Land at Central Avenue, GRAVESEND, DA12 5AW

## General

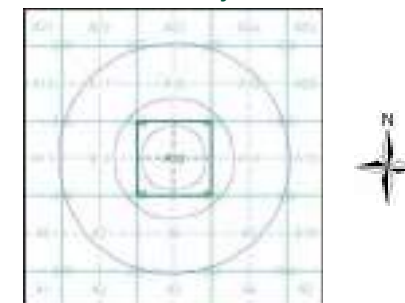
△ Specified Site    
 ○ Specified Buffer(s)    
 X Bearing Reference Point

## Estimated Soil Chemistry Arsenic

Arsenic Concentrations mg/kg



## Estimated Soil Chemistry Arsenic - Slice A



## Order Details

Order Details: 272544619\_1\_1  
 Customer Ref: 002-21-719  
 National Grid Reference: 564920, 172400  
 Slice: A  
 Site Area (Ha): 0.4  
 Search Buffer (m): 1000

## Site Details

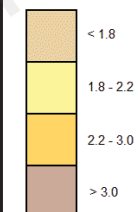
Land at Central Avenue, GRAVESEND, DA12 5AW

## General

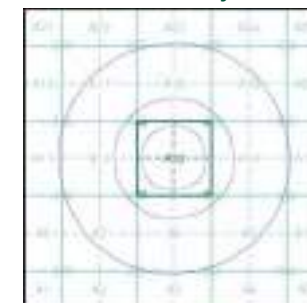
X Specified Site     
 ○ Specified Buffer(s)     
 X Bearing Reference Point

## Estimated Soil Chemistry Cadmium

Cadmium Concentrations mg/kg



## Estimated Soil Chemistry Cadmium - Slice A



## Order Details

Order Details: 272544619\_1\_1  
 Customer Ref: 002-21-719  
 National Grid Reference: 564920, 172400  
 Slice: A  
 Site Area (Ha): 0.4  
 Search Buffer (m): 1000

## Site Details

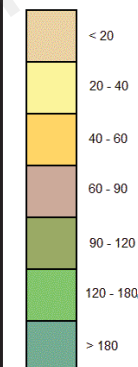
Land at Central Avenue, GRAVESEND, DA12 5AW

## General

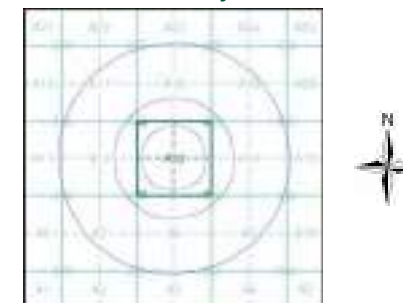
◇ Specified Site    
 ○ Specified Buffer(s)    
 X Bearing Reference Point

## Estimated Soil Chemistry Chromium

Chromium Concentrations mg/kg



## Estimated Soil Chemistry Chromium - Slice A



## Order Details

Order Details: 272544619\_1\_1  
 Customer Ref: 002-21-719  
 National Grid Reference: 564920, 172400  
 Slice: A  
 Site Area (Ha): 0.4  
 Search Buffer (m): 1000

## Site Details

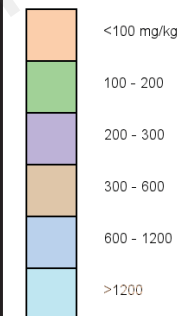
Land at Central Avenue, GRAVESEND, DA12 5AW

## General

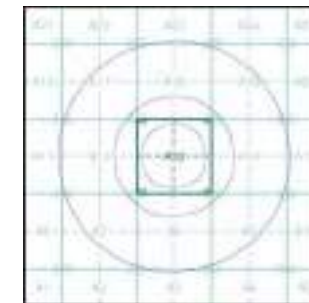
 Specified Site
  Specified Buffer(s)
  Bearing Reference Point

## Estimated Soil Chemistry Lead

Lead Concentrations mg/kg



## Estimated Soil Chemistry Lead - Slice A



## Order Details

Order Details: 272544619\_1\_1  
 Customer Ref: 002-21-719  
 National Grid Reference: 564920, 172400  
 Slice: A  
 Site Area (Ha): 0.4  
 Search Buffer (m): 1000

## Site Details

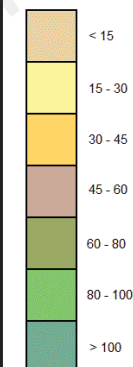
Land at Central Avenue, GRAVESEND, DA12 5AW

## General

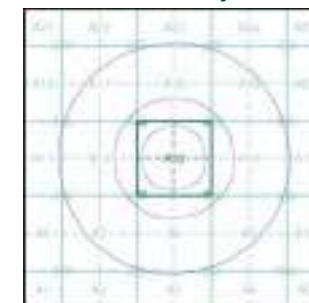
□ Specified Site     
 ○ Specified Buffer(s)     
 X Bearing Reference Point

## Estimated Soil Chemistry Nickel

Nickel Concentrations mg/kg



## Estimated Soil Chemistry Nickel - Slice A



## Order Details

Order Details: 272544619\_1\_1  
 Customer Ref: 002-21-719  
 National Grid Reference: 564920, 172400  
 Slice: A  
 Site Area (Ha): 0.4  
 Search Buffer (m): 1000

## Site Details

Land at Central Avenue, GRAVESEND, DA12 5AW



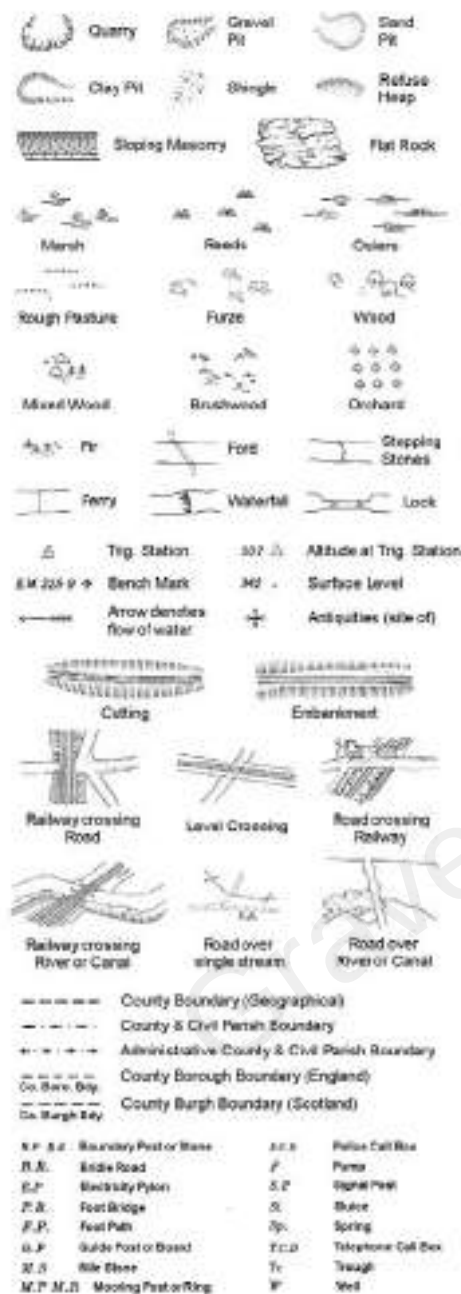
## **APPENDIX III**

### **HISTORICAL MAP EXTRACTS**

Gravesham Borough Council

## Historical Mapping Legends

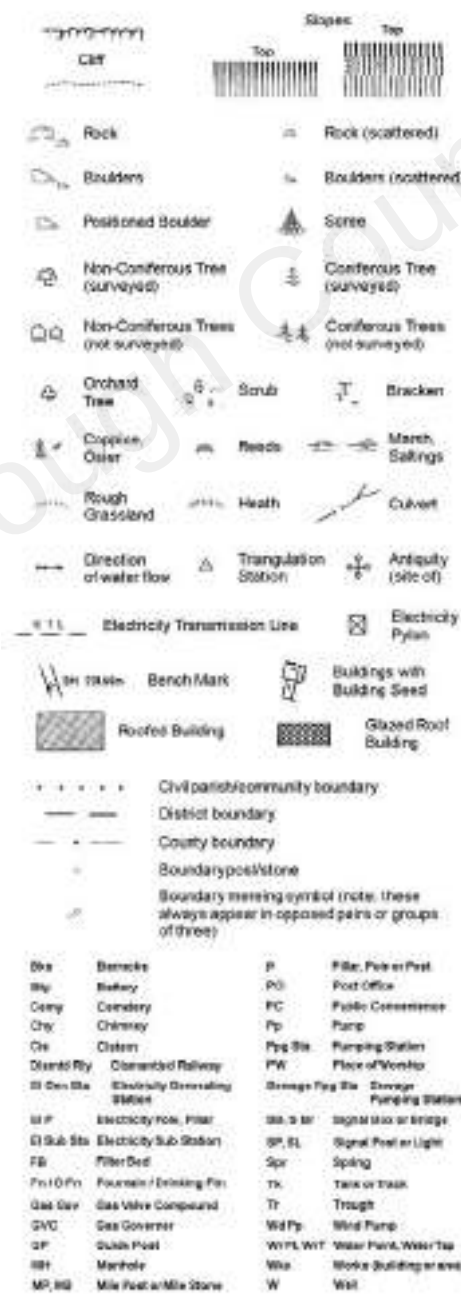
### Ordnance Survey County Series and Ordnance Survey Plan 1:2,500



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



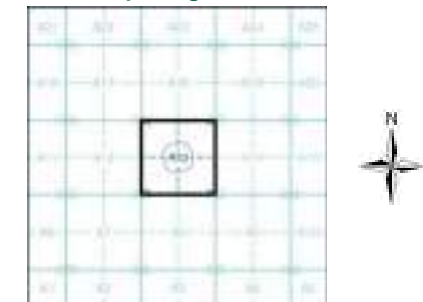
### Large-Scale National Grid Data 1:2,500 and 1:1,250



### Historical Mapping & Photography included:

| Mapping Type                             | Scale   | Date        | Pg |
|------------------------------------------|---------|-------------|----|
| Kent                                     | 1:2,500 | 1874 - 1882 | 2  |
| Kent                                     | 1:2,500 | 1896        | 3  |
| Kent                                     | 1:2,500 | 1908 - 1909 | 4  |
| Kent                                     | 1:2,500 | 1936 - 1938 | 5  |
| Ordnance Survey Plan                     | 1:2,500 | 1954        | 6  |
| Ordnance Survey Plan                     | 1:2,500 | 1955        | 7  |
| Additional SIMs                          | 1:2,500 | 1955        | 8  |
| Ordnance Survey Plan                     | 1:1,250 | 1972 - 1974 | 9  |
| Supply of Unpublished Survey Information | 1:1,250 | 1973        | 10 |
| Additional SIMs                          | 1:1,250 | 1981 - 1987 | 11 |
| Ordnance Survey Plan                     | 1:1,250 | 1986        | 12 |
| Additional SIMs                          | 1:1,250 | 1990        | 13 |
| Large-Scale National Grid Data           | 1:1,250 | 1992 - 1993 | 14 |
| Large-Scale National Grid Data           | 1:1,250 | 1993        | 15 |
| Historical Aerial Photography            | 1:2,500 | 1999        | 16 |

### Historical Map - Segment A13



### Order Details

Order Number: 272544619\_1\_1  
Customer Ref: 002-21-719  
National Grid Reference: 564920, 172400  
Slice: A  
Site Area (Ha): 0.4  
Search Buffer (m): 100

### Site Details

Land at Central Avenue, GRAVESEND, DA12 5AW

# Historical Mapping Legends

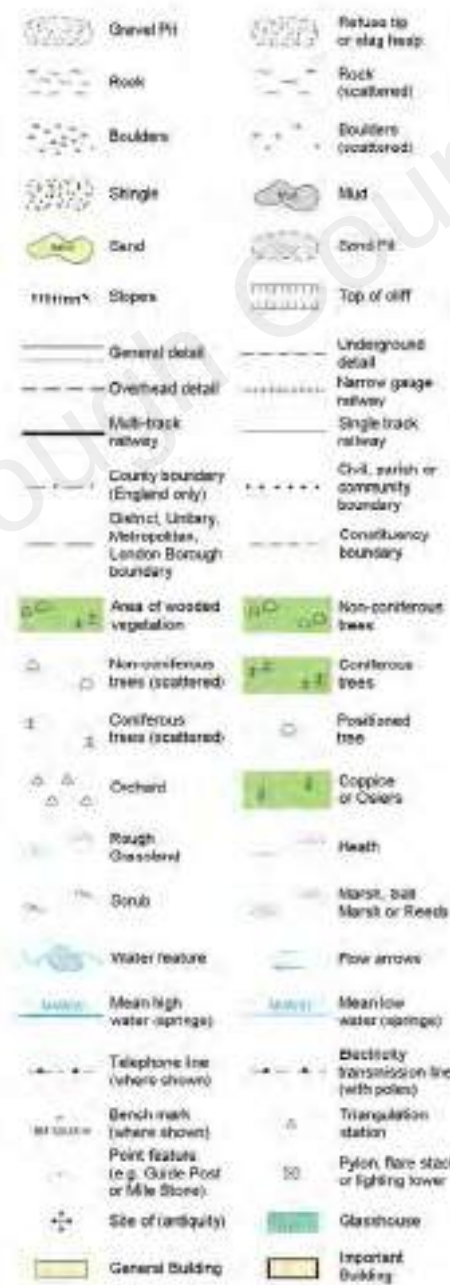
## Ordnance Survey County Series 1:10,560



## Ordnance Survey Plan 1:10,000



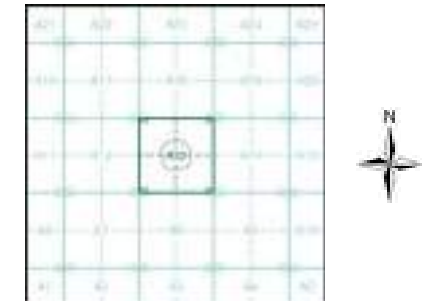
## 1:10,000 Raster Mapping



## Historical Mapping & Photography included:

| Mapping Type                  | Scale    | Date        | Pg |
|-------------------------------|----------|-------------|----|
| Kent                          | 1:10,560 | 1869        | 3  |
| Essex                         | 1:10,560 | 1872        | 4  |
| Kent                          | 1:10,560 | 1898 - 1899 | 5  |
| Essex                         | 1:10,560 | 1898 - 1899 | 6  |
| Kent                          | 1:10,560 | 1909 - 1910 | 7  |
| Kent                          | 1:10,560 | 1909        | 8  |
| Kent                          | 1:10,560 | 1909        | 9  |
| Essex                         | 1:10,560 | 1923        | 10 |
| Kent                          | 1:10,560 | 1931 - 1932 | 11 |
| Kent                          | 1:10,560 | 1938        | 12 |
| Kent                          | 1:10,560 | 1938 - 1951 | 13 |
| Essex                         | 1:10,560 | 1938        | 14 |
| Essex                         | 1:10,560 | 1938        | 15 |
| Historical Aerial Photography | 1:10,560 | 1947        | 16 |
| Ordnance Survey Plan          | 1:10,000 | 1961 - 1962 | 17 |
| Ordnance Survey Plan          | 1:10,000 | 1966        | 18 |
| Ordnance Survey Plan          | 1:10,000 | 1973 - 1975 | 19 |
| Gravesend                     | 1:10,000 | 1977        | 20 |
| Ordnance Survey Plan          | 1:10,000 | 1980 - 1982 | 21 |
| Ordnance Survey Plan          | 1:10,000 | 1991        | 22 |
| 10K Raster Mapping            | 1:10,000 | 1999        | 23 |
| 10K Raster Mapping            | 1:10,000 | 2006        | 24 |
| VectorMap Local               | 1:10,000 | 2020        | 25 |

## Historical Map - Slice A



## Order Details

Order Number: 272544619\_1\_1  
Customer Ref: 002-21-719  
National Grid Reference: 564920, 172400  
Slice: A  
Site Area (Ha): 0.4  
Search Buffer (m): 1000

## Site Details

Land at Central Avenue, GRAVESEND, DA12 5AW

## Kent

Published 1869

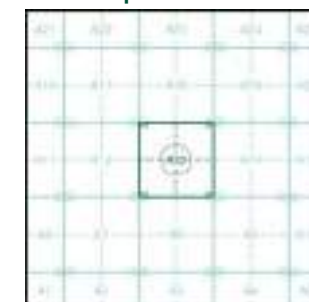
Source map scale - 1:10,560

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas. In the late 1940's, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

## Map Name(s) and Date(s)



## Historical Map - Slice A

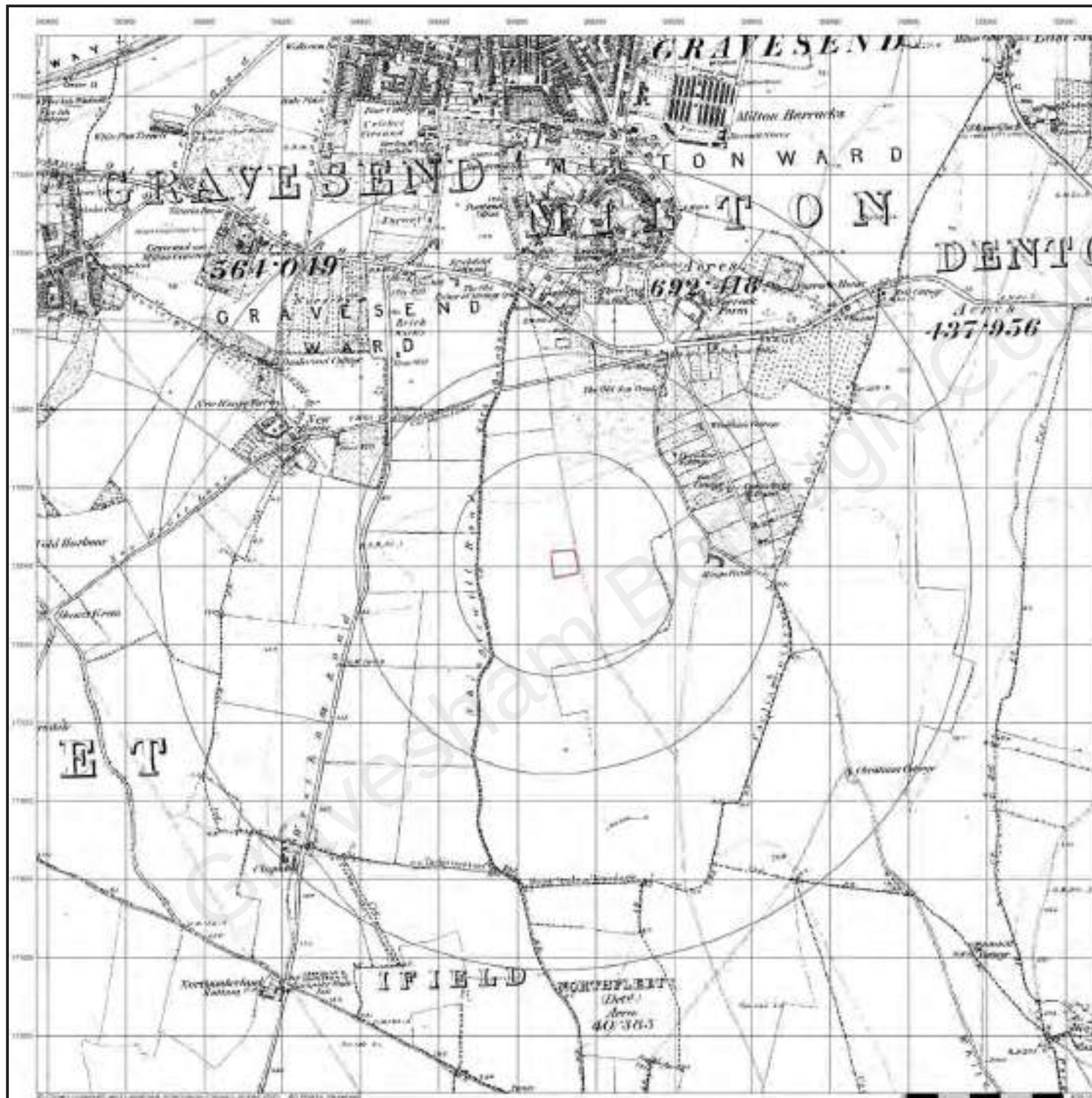


## Order Details

Order Number: 272544619\_1\_1  
Customer Ref: 002-21-719  
National Grid Reference: 564920, 172400  
Slice: A  
Site Area (Ha): 0.4  
Search Buffer (m): 1000

## Site Details

Land at Central Avenue, GRAVESEND, DA12 5AW



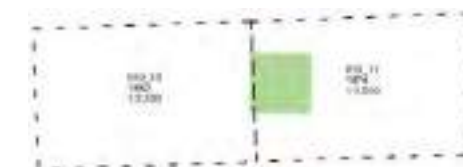
## Kent

Published 1874 - 1882

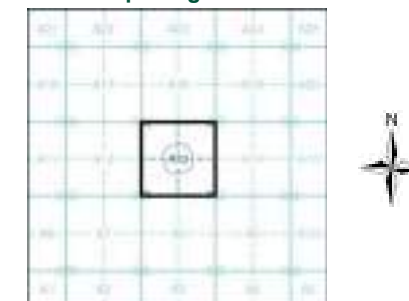
Source map scale - 1:2,500

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

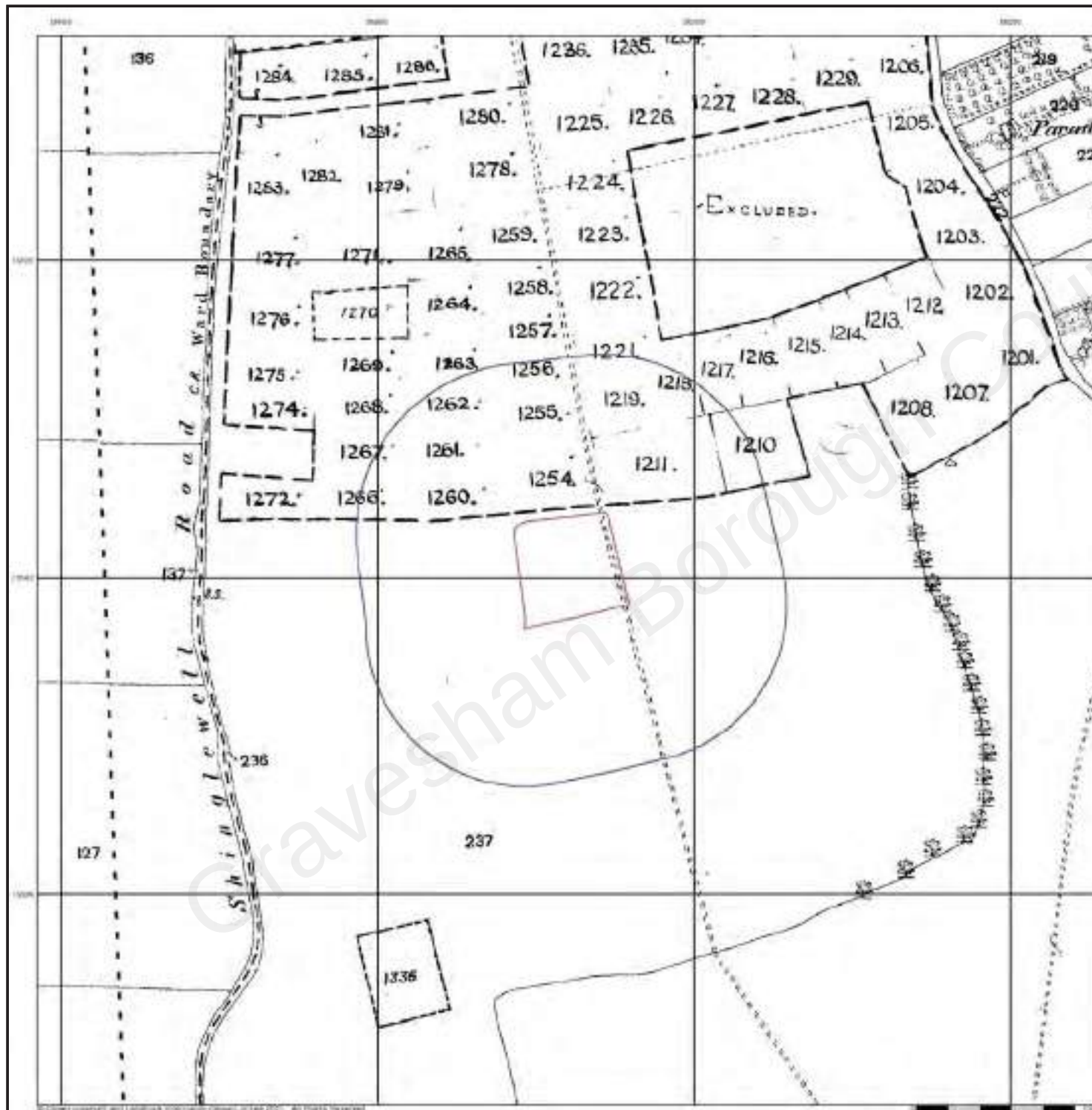


## Order Details

Order Number: 272544619\_1\_1  
Customer Ref: 002-21-719  
National Grid Reference: 564920, 172400  
Slice: A  
Site Area (Ha): 0.4  
Search Buffer (m): 100

## Site Details

Land at Central Avenue, GRAVESEND, DA12 5AW



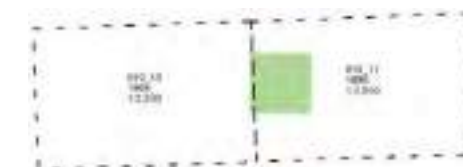
## Kent

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)



## Kent

Published 1898 - 1899

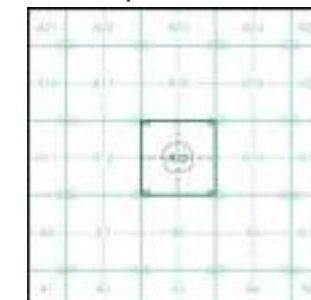
Source map scale - 1:10,560

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas. In the late 1940's, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

## Map Name(s) and Date(s)



## Historical Map - Slice A



## Order Details

Order Number: 272544619\_1\_1  
Customer Ref: 002-21-719  
National Grid Reference: 564920, 172400  
Slice: A  
Site Area (Ha): 0.4  
Search Buffer (m): 1000

## Site Details

Land at Central Avenue, GRAVESEND, DA12 5AW

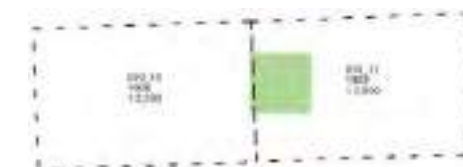
## Kent

Published 1908 - 1909

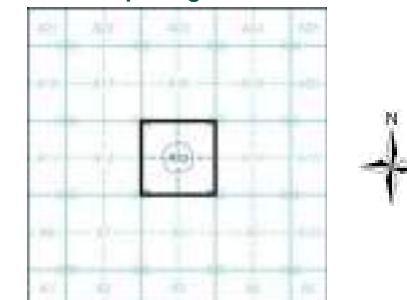
Source map scale - 1:2,500

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)



## Historical Map - Segment A13



## Order Details

Order Number: 272544619\_1\_1  
 Customer Ref: 002-21-719  
 National Grid Reference: 564920, 172400  
 Slice: A  
 Site Area (Ha): 0.4  
 Search Buffer (m): 100

## Site Details

Land at Central Avenue, GRAVESEND, DA12 5AW

## Kent

Published 1909 - 1910

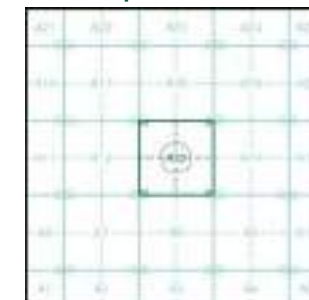
Source map scale - 1:10,560

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas. In the late 1940's, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

## Map Name(s) and Date(s)



## Historical Map - Slice A



## Order Details

Order Number: 272544619\_1\_1  
 Customer Ref: 002-21-719  
 National Grid Reference: 564920, 172400  
 Slice: A  
 Site Area (Ha): 0.4  
 Search Buffer (m): 1000

## Site Details

Land at Central Avenue, GRAVESEND, DA12 5AW



## Kent

Published 1931 - 1932

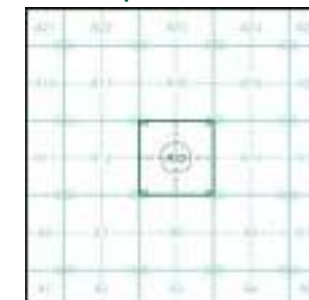
Source map scale - 1:10,560

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas. In the late 1940's, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

## Map Name(s) and Date(s)



## Historical Map - Slice A



## Order Details

Order Number: 272544619\_1\_1  
 Customer Ref: 002-21-719  
 National Grid Reference: 564920, 172400  
 Slice: A  
 Site Area (Ha): 0.4  
 Search Buffer (m): 1000

## Site Details

Land at Central Avenue, GRAVESEND, DA12 5AW

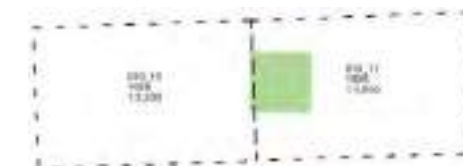
## Kent

Published 1936 - 1938

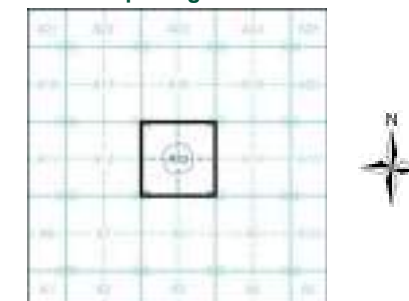
Source map scale - 1:2,500

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: 272544619\_1\_1  
 Customer Ref: 002-21-719  
 National Grid Reference: 564920, 172400  
 Slice: A  
 Site Area (Ha): 0.4  
 Search Buffer (m): 100

## Site Details

Land at Central Avenue, GRAVESEND, DA12 5AW

## Kent

Published 1938

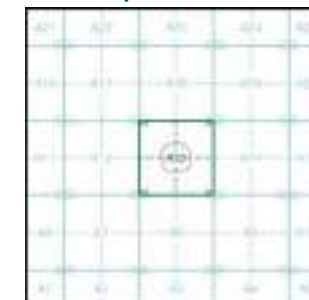
Source map scale - 1:10,560

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas. In the late 1940's, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

## Map Name(s) and Date(s)



## Historical Map - Slice A



## Order Details

Order Number: 272544619\_1\_1  
 Customer Ref: 002-21-719  
 National Grid Reference: 564920, 172400  
 Slice: A  
 Site Area (Ha): 0.4  
 Search Buffer (m): 1000

## Site Details

Land at Central Avenue, GRAVESEND, DA12 5AW

## Kent

Published 1938 - 1951

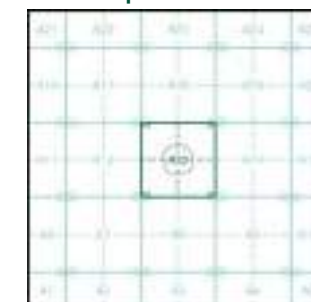
Source map scale - 1:10,560

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas. In the late 1940's, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

## Map Name(s) and Date(s)



## Historical Map - Slice A



## Order Details

Order Number: 272544619\_1\_1  
 Customer Ref: 002-21-719  
 National Grid Reference: 564920, 172400  
 Slice: A  
 Site Area (Ha): 0.4  
 Search Buffer (m): 1000

## Site Details

Land at Central Avenue, GRAVESEND, DA12 5AW

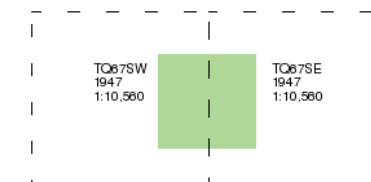
## Historical Aerial Photography Published 1947

Source map scale - 1:10,560

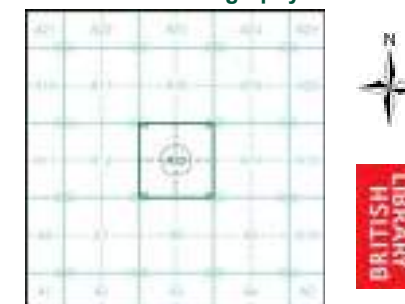
The Historical Aerial Photos were produced by the Ordnance Survey at a scale of 1:1,250 and 1:10,560 from Air Force photography. They were produced between 1944 and 1951 as an interim measure, pending preparation of conventional mapping, due to post war resource shortages. New security measures in the 1950's meant that every photograph was re-checked for potentially unsafe information with security sites replaced by fake fields or clouds. The original editions were withdrawn and only later made available after a period of fifty years although due to the accuracy of the editing, without viewing both revisions it is not easy to spot the edits. Where available Landmark have included both revisions.

© Landmark Information Group and/or Data Suppliers 2010.

### Map Name(s) and Date(s)



### Historical Aerial Photography - Slice A



### Order Details

Order Number: 272544619\_1\_1  
Customer Ref: 002-21-719  
National Grid Reference: 564920, 172400  
Slice: A  
Site Area (Ha): 0.4  
Search Buffer (m): 1000

### Site Details

Land at Central Avenue, GRAVESEND, DA12 5AW



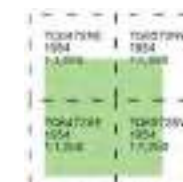
## Ordnance Survey Plan

Published 1954

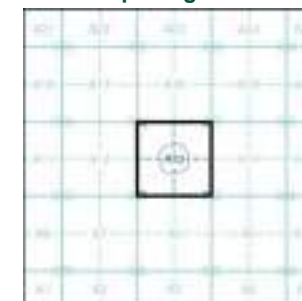
Source map scale - 1:1,250

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: 272544619\_1\_1  
 Customer Ref: 002-21-719  
 National Grid Reference: 564920, 172400  
 Slice: A  
 Site Area (Ha): 0.4  
 Search Buffer (m): 100

## Site Details

Land at Central Avenue, GRAVESEND, DA12 5AW

## Ordnance Survey Plan

Published 1961 - 1962

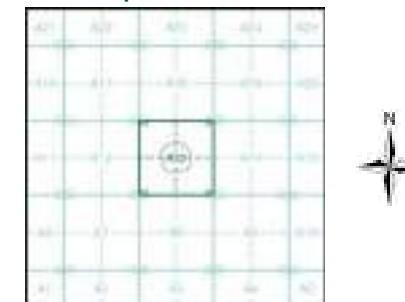
Source map scale - 1:10,000

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas. In the late 1940's, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

## Map Name(s) and Date(s)



## Historical Map - Slice A



## Order Details

Order Number: 272544619\_1\_1  
 Customer Ref: 002-21-719  
 National Grid Reference: 564920, 172400  
 Slice: A  
 Site Area (Ha): 0.4  
 Search Buffer (m): 1000

## Site Details

Land at Central Avenue, GRAVESEND, DA12 5AW

## Ordnance Survey Plan

Published 1966

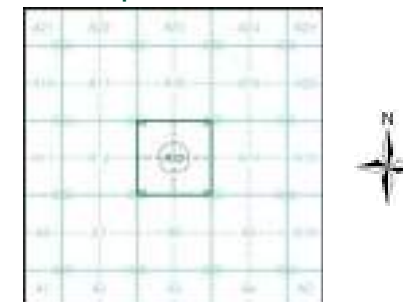
Source map scale - 1:10,000

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas. In the late 1940's, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

## Map Name(s) and Date(s)



## Historical Map - Slice A



## Order Details

Order Number: 272544619\_1\_1  
 Customer Ref: 002-21-719  
 National Grid Reference: 564920, 172400  
 Slice: A  
 Site Area (Ha): 0.4  
 Search Buffer (m): 1000

## Site Details

Land at Central Avenue, GRAVESEND, DA12 5AW

## Ordnance Survey Plan

Published 1972 - 1974

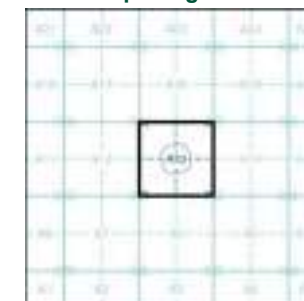
Source map scale - 1:1,250

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: 272544619\_1\_1  
 Customer Ref: 002-21-719  
 National Grid Reference: 564920, 172400  
 Slice: A  
 Site Area (Ha): 0.4  
 Search Buffer (m): 100

## Site Details

Land at Central Avenue, GRAVESEND, DA12 5AW

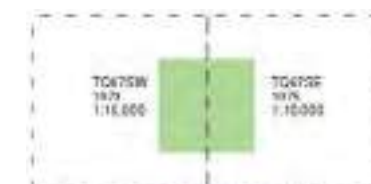
## Ordnance Survey Plan

Published 1973 - 1975

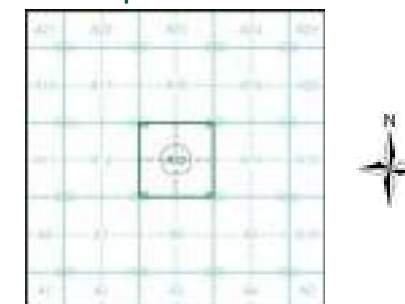
Source map scale - 1:10,000

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas. In the late 1940's, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

## Map Name(s) and Date(s)



## Historical Map - Slice A



## Order Details

Order Number: 272544619\_1\_1  
 Customer Ref: 002-21-719  
 National Grid Reference: 564920, 172400  
 Slice: A  
 Site Area (Ha): 0.4  
 Search Buffer (m): 1000

## Site Details

Land at Central Avenue, GRAVESEND, DA12 5AW

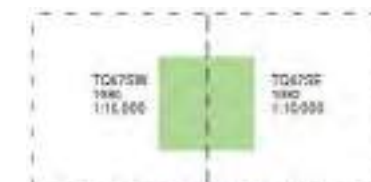
## Ordnance Survey Plan

Published 1980 - 1982

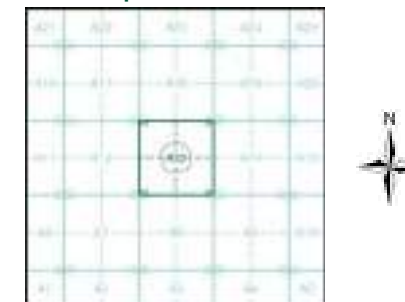
Source map scale - 1:10,000

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas. In the late 1940's, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

## Map Name(s) and Date(s)



## Historical Map - Slice A



## Order Details

Order Number: 272544619\_1\_1  
 Customer Ref: 002-21-719  
 National Grid Reference: 564920, 172400  
 Slice: A  
 Site Area (Ha): 0.4  
 Search Buffer (m): 1000

## Site Details

Land at Central Avenue, GRAVESEND, DA12 5AW

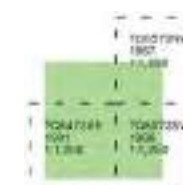
## Additional SIMs

Published 1981 - 1987

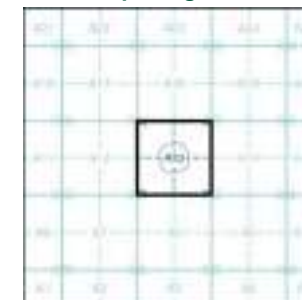
Source map scale - 1:1,250

The SIM cards (Ordnance Survey's 'Survey of Information on Microfilm') are further, minor editions of mapping which were produced and published in between the main editions as an area was updated. They date from 1947 to 1994, and contain detailed information on buildings, roads and land-use. 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: 272544619\_1\_1  
 Customer Ref: 002-21-719  
 National Grid Reference: 564920, 172400  
 Slice: A  
 Site Area (Ha): 0.4  
 Search Buffer (m): 100

## Site Details

Land at Central Avenue, GRAVESEND, DA12 5AW

## Ordnance Survey Plan

Published 1986

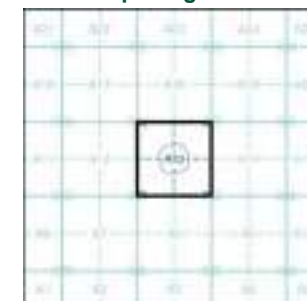
Source map scale - 1:1,250

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: 272544619\_1\_1  
 Customer Ref: 002-21-719  
 National Grid Reference: 564920, 172400  
 Slice: A  
 Site Area (Ha): 0.4  
 Search Buffer (m): 100

## Site Details

Land at Central Avenue, GRAVESEND, DA12 5AW

## Ordnance Survey Plan

Published 1991

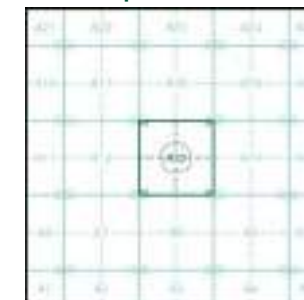
Source map scale - 1:10,000

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas. In the late 1940's, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

## Map Name(s) and Date(s)



## Historical Map - Slice A



## Order Details

Order Number: 272544619\_1\_1  
Customer Ref: 002-21-719  
National Grid Reference: 564920, 172400  
Slice: A  
Site Area (Ha): 0.4  
Search Buffer (m): 1000

## Site Details

Land at Central Avenue, GRAVESEND, DA12 5AW

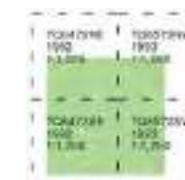
## Large-Scale National Grid Data

Published 1992 - 1993

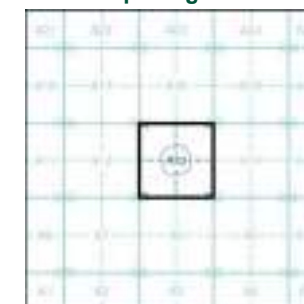
Source map scale - 1:1,250

'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: 272544619\_1\_1  
 Customer Ref: 002-21-719  
 National Grid Reference: 564920, 172400  
 Slice: A  
 Site Area (Ha): 0.4  
 Search Buffer (m): 100

## Site Details

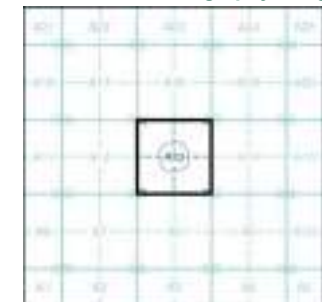
Land at Central Avenue, GRAVESEND, DA12 5AW



## 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

Order Number: 272544619\_1\_1  
Customer Ref: 002-21-719  
National Grid Reference: 564920, 172400  
Slice: A  
Site Area (Ha): 0.4  
Search Buffer (m): 100

### Site Details

Land at Central Avenue, GRAVESEND, DA12 5AW

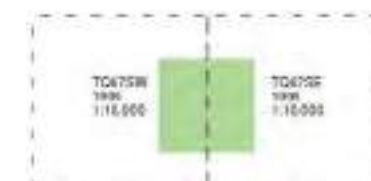
## 10k Raster Mapping

Published 1999

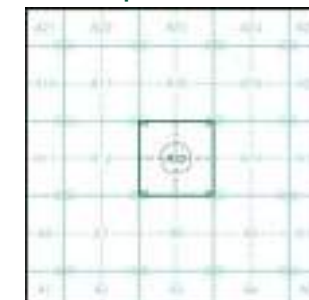
Source map scale - 1:10,000

The historical maps shown were produced from the Ordnance Survey's 1:10,000 colour raster mapping. These maps are derived from Landplan which replaced the old 1:10,000 maps originally published in 1970. The data is highly detailed showing buildings, fences and field boundaries as well as all roads, tracks and paths. Road names are also included together with the relevant road number and classification. Boundary information depiction includes county, unitary authority, district, civil parish and constituency.

## Map Name(s) and Date(s)



## Historical Map - Slice A



## Order Details

Order Number: 272544619\_1\_1  
 Customer Ref: 002-21-719  
 National Grid Reference: 564920, 172400  
 Slice: A  
 Site Area (Ha): 0.4  
 Search Buffer (m): 1000

## Site Details

Land at Central Avenue, GRAVESEND, DA12 5AW

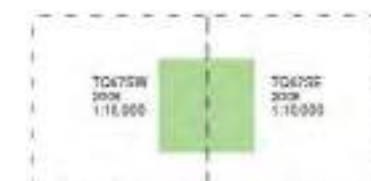
## 10k Raster Mapping

Published 2006

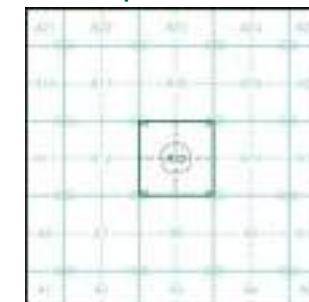
Source map scale - 1:10,000

The historical maps shown were produced from the Ordnance Survey's 1:10,000 colour raster mapping. These maps are derived from Landplan which replaced the old 1:10,000 maps originally published in 1970. The data is highly detailed showing buildings, fences and field boundaries as well as all roads, tracks and paths. Road names are also included together with the relevant road number and classification. Boundary information depiction includes county, unitary authority, district, civil parish and constituency.

## Map Name(s) and Date(s)



## Historical Map - Slice A



## Order Details

Order Number: 272544619\_1\_1  
 Customer Ref: 002-21-719  
 National Grid Reference: 564920, 172400  
 Slice: A  
 Site Area (Ha): 0.4  
 Search Buffer (m): 1000

## Site Details

Land at Central Avenue, GRAVESEND, DA12 5AW

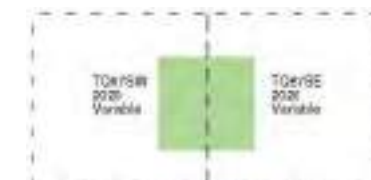
## VectorMap Local

Published 2020

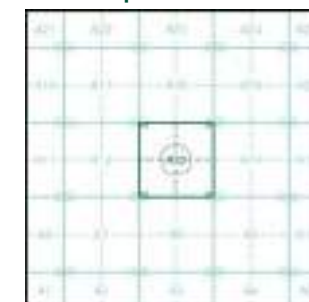
Source map scale - 1:10,000

VectorMap Local (Raster) is Ordnance Survey's highest detailed 'backdrop' mapping product. These maps are produced from OS's VectorMap Local, a simple vector dataset at a nominal scale of 1:10,000, covering the whole of Great Britain, that has been designed for creating graphical mapping. OS VectorMap Local is derived from large-scale information surveyed at 1:1250 scale (covering major towns and cities), 1:2500 scale (smaller towns, villages and developed rural areas), and 1:10 000 scale (mountain, moorland and river estuary areas).

## Map Name(s) and Date(s)



## Historical Map - Slice A



## Order Details

Order Number: 272544619\_1\_1  
 Customer Ref: 002-21-719  
 National Grid Reference: 564920, 172400  
 Slice: A  
 Site Area (Ha): 0.4  
 Search Buffer (m): 1000

## Site Details

Land at Central Avenue, GRAVESEND, DA12 5AW



**APPENDIX IV**  
**UXO DESK TOP STUDY**

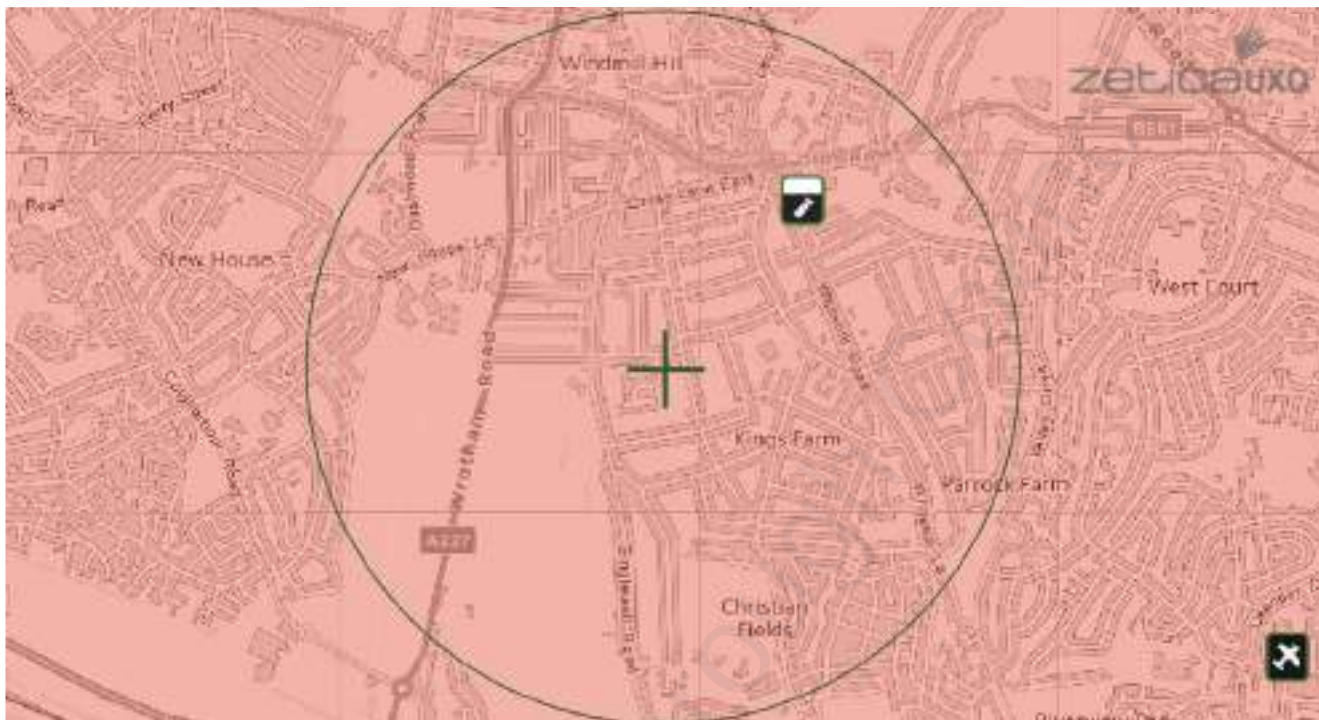
Gravesham Borough Council

# UNEXPLODED BOMB RISK MAP



## SITE LOCATION

Map Centre: 564910,172405



## LEGEND

- High:** Areas indicated as having a bombing density of 50 bombs per 1000acre or higher.
- Moderate:** Areas indicated as having a bombing density of 15 to 49 bombs per 1000acre.
- Low:** Areas indicated as having 15 bombs per 1000acre or less.

- military
- industry
- UXO find
- transport
- dock
- Luftwaffe targets
- utilities
- Bombing decoy
- other

### How to use your Unexploded Bomb (UXB) risk map?

The map indicates the potential for Unexploded Bombs (UXB) to be present as a result of World War Two (WWII) bombing.

You can incorporate the map into your preliminary risk assessment\* for potential Unexploded Ordnance (UXO) for a site. Using this map, you can make an informed decision as to whether more in-depth detailed risk assessment\* is necessary.

### What do I do if my site is in a moderate or high risk area?

Generally, we recommend that a detailed UXO desk study and risk assessment is undertaken for sites in a moderate or high UXB risk area.

Similarly, if your site is near to a designated Luftwaffe target or bombing decoy then additional detailed research is recommended.

More often than not, this further detailed research will conclude that the potential for a significant UXO hazard to be present on your site is actually low.

**Never plan site work or undertake a risk assessment using these maps alone. More detail is required, particularly where there may be a source of UXO from other military operations which are not reflected on these maps.**

### If my site is in a low risk area, do I need to do anything?

If both the map and other research confirms that there is a low potential for UXO to be present on your site then, subject to your own comfort and risk tolerance, works can proceed with no special precautions.

A low risk really means that there is no greater probability of encountering UXO than anywhere else in the UK.

If you are unsure whether other sources of UXO may be present, you can ask for one of our **pre-desk study assessments (PDSA)**

### If I have any questions, who do I contact?

tel: **+44 (0) 1993 886682**

email: **uxo@zetica.com**

web: **www.zeticauxo.com**

The information in this UXB risk map is derived from a number of sources and should be used in conjunction with the accompanying notes on our website: (<https://zeticauxo.com/downloads-and-resources/risk-maps/>)

Zetica cannot guarantee the accuracy or completeness of the information or data used and cannot accept any liability for any use of the maps. These maps can be used as part of a technical report or similar publication, subject to acknowledgment. The copyright remains with Zetica Ltd.

It is important to note that this map is not a UXO risk assessment and should not be reported as such when reproduced.

\*Preliminary and detailed UXO risk assessments are advocated as good practice by industry guidance such as CIRIA C681 'Unexploded Ordnance (UXO), a guide for the construction industry'.



# International Unexploded Ordnance Risk Mitigation

Many People...

One Aim

**EXPLOSIVE ORDNANCE  
DESKTOP STUDY  
FOR:**

**PROJECT 21086**

**ASCOT ARMS  
CENTRAL AVENUE  
GRAVESEND  
DA12 5AW**

**asl**



## EXPLOSIVE ORDNANCE DESKTOP STUDY

Of

**ASCOT ARMS  
CENTRAL AVENUE  
GRAVESEND  
DA12 5AW**

Conducted by EOD Contracts Limited

On behalf of



### Conditions of Release

This document was produced in the United Kingdom of Great Britain & Northern Ireland and is copyright © EOD Contracts Ltd. It has been prepared for the titled project, or named part thereof, and should not be relied upon or used for any other project without an independent check being carried out as to its suitability and prior written authority of EOD Contracts Ltd being obtained. EOD Contracts Ltd accepts no responsibility or liability for this document to any party other than the person by whom it was commissioned. To the extent that this report is based on information supplied by other parties; EOD Contracts accepts no liability for any loss or damage suffered by the client, whether contractual or otherwise, stemming from any conclusions based on data supplied by parties other than EOD contracts Ltd and used by EOD contracts Ltd in preparing this report. This document has been produced for the purpose of assessment and evaluation only. The contents of this document shall not in whole or in part: 1. Be used for any purpose other than that for which it was intended, 2. Be disclosed to any individual not having a need to know such information nor to any third party individual, organisation or government, 3. Be stored in any retrieval system nor be reproduced or transmitted in any form by any optical, electronic, mechanical or other means including photocopying, without the prior written permission of EOD Contracts Ltd, Unit G1, Holly Farm Business Park, Honiley, Kenilworth CV81NP United Kingdom.

### Document Control & Enquiries

|                                                                                                                                                                                                                                                                          |                                                                                                                                                                                |            |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| <b>Document Reference:</b> EOD/21/21086/DTS/ASL/Ascot Arms, Central Avenue, Gravesend, DA12 5AW                                                                                                                                                                          |                                                                                                                                                                                |            |
| <b>Distribution Copy 1 (Electronic)</b>                                                                                                                                                                                                                                  | <b>Distribution Copy 2 (Electronic)</b>                                                                                                                                        |            |
| Archived                                                                                                                                                                                                                                                                 | Uncontrolled                                                                                                                                                                   |            |
| <b>EOD Contracts Limited.</b><br>26-28 Kempton Road<br>Keytec 7 Business Park<br>Pershore<br>WR10 2TA                                                                                                                                                                    | The logo for ASL (Ascot Arms Limited) is displayed. It consists of the lowercase letters 'asl' in a bold, black, sans-serif font, set against a yellow rectangular background. |            |
| Document Originator                                                                                                                                                                                                                                                      | Alan Hall                                                                                                                                                                      | 26/02/2021 |
| Authorised Release                                                                                                                                                                                                                                                       | Shane Meaker                                                                                                                                                                   | 26/02/2021 |
| All enquiries regarding this document should be directed to:<br>Email: <a href="mailto:shane.meaker@eodcontractsLtd.com">shane.meaker@eodcontractsLtd.com</a><br>Telephone: 01386 578405.<br>Alternatively, the persons named above can be reached at the above address. |                                                                                                                                                                                |            |

## CONTENTS

| Title                                     | Pages          |
|-------------------------------------------|----------------|
| Front Cover                               | i              |
| Document Control & Enquiries              | ii             |
| Contents Page                             | iii-iv         |
| Terms and Definitions                     | v-vi           |
| Executive Summary                         | vii            |
| Scope of works                            | viii           |
| Sources of UXO Contamination              | ix             |
| Key Findings                              | x              |
| Recommendations                           | xi-xiii        |
| <b>INTRODUCTION</b>                       | <b>1</b>       |
| Instruction                               | 1              |
| Scope of Work                             | 1              |
| Restrictions                              | 2              |
| Sensitive Documentation                   | 2              |
| Objective                                 | 2              |
| <b>SOURCES OF INFORMATION</b>             | <b>3</b>       |
| Ministry of Defence Records               | 3              |
| Attack Record Keeping                     | 3              |
| Attack Record Accuracy                    | 3-4            |
| Errors and Omissions                      | 4              |
| Bibliography                              | 4              |
| <b>SITE DESCRIPTION AND DETAILS</b>       | <b>5</b>       |
| Site Description & Location               | 5-6            |
| Geology                                   | 6              |
| Current Site Use                          | 6              |
| Future Works                              | 7              |
| <b>HISTORICAL REVIEW</b>                  | <b>8</b>       |
| Historical Mapping and Aerial Photography | 8              |
| WWI                                       | 8-10           |
| WWII                                      | 9-1            |
| Abandoned Bombs/UXO                       | 11             |
| Anti-Aircraft Artillery                   | 11             |
| Prior Clearance Operations                | 11             |
| V1 & V2 Bomb Strikes                      | 11             |
| <b>SOURCES OF UXO CONTAMINATION</b>       | <b>12</b>      |
| General                                   | 12-13          |
| Recent UXO finds within the UK            | 14             |
| <b>RISK ASSESSMENT</b>                    | <b>15</b>      |
| Risk Assessment                           | 15-17          |
| <b>CONCLUSIONS</b>                        | <b>18 - 20</b> |

| <b>Annexes</b> |                                           |             |
|----------------|-------------------------------------------|-------------|
| Annex A        | Location Map                              | A-1         |
| Annex B        | Historic Maps                             | B-1 to B-4  |
| Annex C        | WW1 Bomb Map                              | C-1         |
| Annex D        | Explosive Ordnance Information and Safety | D-1 to D-10 |
| Annex E        | Recent UXO Finds (UK)                     | E-1 to E-5  |
| Annex F        | Tables                                    | F-1 to F-4  |

## **TERMS AND DEFINITIONS**

### **Anti-Aircraft Shells (AA)**

Small High Explosive Shells (HE) shells ranging up to 100mm in diameter.

### **Battlefield Area Clearance (BAC)**

The systematic clearance of munitions from military property or old battle sites e.g., ranges, airfields etc.

### **Borehole Search**

The placing of boreholes in a set pattern, then using a magnetometer to take readings at specific depths along each borehole. When used with a geophysical survey system this will give a magnetic signature of the area. The depth of the borehole and the pattern will depend upon the type of Unexploded Bombs (UXB) and the geology of the ground.

### **Doodle Bug (See Pilotless Aircraft)**

### **Explosive Ordnance (EO)**

All munitions containing explosives, nuclear fission/fusion materials and or biological and chemical agents. This includes bombs and warheads; guided and ballistic missiles; artillery, mortar, rocket and Small Arms Ammunition (SAA); all mines, torpedoes and depth charges; pyrotechnics; clusters and dispensers; cartridge and propellant actuated devices; electro-explosive devices; clandestine and improvised explosive devices (IED); and all similar or related items or components explosive in nature.

### **Explosive Ordnance Clearance (EOC)**

See BAC.

### **Explosive Ordnance Disposal (EOD)**

The detection, identification, field evaluation, render safe, recovery and disposal of **UXO**.

### **Geophysical Survey**

The survey of an area using a Magnetometer and geophysical gathering device, after interpretation, this will produce a geophysical map and an object list for any metallic anomalies.

### **High Explosive (HE)**

High explosives burn/detonate at rates of up to 9,000 m/per second.

### **Incendiary Bomb (IB)**

Incendiary bombs ranged from 1kg in size to 500kg the larger sizes were sometimes called Oil Bombs. Fills range from thermite mixtures, phosphorus to kerosene.

### **Intrusive Survey**

The use of a cone penetrometer (MagCone) or drilled boreholes (MagDrill) to take magnetometer test in a set pattern (see borehole search), or to prove pile positions.

### **Land Service Ammunition (LSA)**

LSA is defined as “All items containing explosives or pyrotechnic compounds which are placed, thrown or projected so as to cause damage to men and equipment during land warfare.

### **Long Range Rocket (LRR)**

The long-range rocket sometimes codenamed Big Ben is the V2 rocket designed to deliver an approximate payload of 1000 kg.

### **Oil Bomb (OB)**

A bomb containing a flammable liquid, normally the KC 250 Flam or the C 500 flam.

### **Pilotless Aircraft (PAC)**

A flying bomb (Fly) or doodlebug is the V1 rocket or predecessors designed to deliver an explosive payload of approximately 500kg - 800kg.

### **Parachute Mine (PM)**

Air dropped mine may have been used as a blast effect bomb maximum explosive content 1600lb always fitted with anti-handling and anti-stripping equipment.

### **Unexploded Bomb (UXB)**

Any air dropped bomb that has failed to operate.

### **Unexploded Ordnance (UXO)**

Explosive ordnance that has been primed, fused, armed or otherwise prepared for use or used. It may have been fired, dropped, launched or projected yet remains unexploded either through malfunction or design or for any other cause.

### **Vengeance Weapons (V)**

V1 see Pilotless Aircraft.

V2 see Long Range Rocket.

### **WWI**

First World War 1 (1914 – 1918)

### **WWII**

Second World War 2 (1939 – 1945)

## EXECUTIVE SUMMARY

1

### INSTRUCTION

EOD Contracts Ltd (ECL), have been commissioned by ASL (hereafter, “the Client”) to undertake a desktop study for potential historic Unexploded Ordnance (UXO) contamination for the future works being carried out within the Highlighted areas provided within the CLIENTS drawing below (**Photo 1.1**).

**Photo 1.1:** Site boundary/drawing provided by Client.

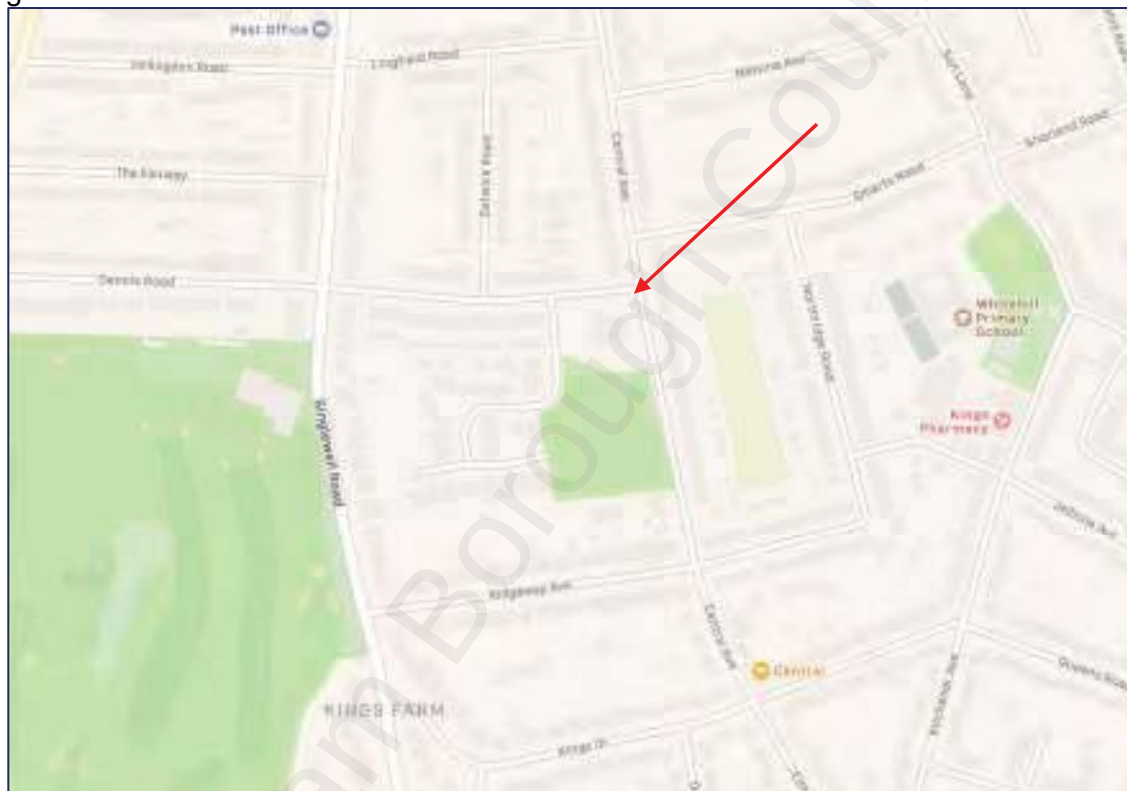


## 2 SCOPE OF WORK

The scope of this EO Risk Assessment/Desk Study is to assess the likelihood of buried EO/UXO within the environs of “the site” (See **Photo 1.1**), in view of further development. A further aim was to evaluate the implication from UXO contamination during any future intrusive land use.

### 2.1 LOCATION

The Site area is located within the DA12 postcode of Gravesend. Access to the Site is gained via Ascot Road.



| TITLE          | DESCRIPTION (CENTRE OF SITE) |
|----------------|------------------------------|
| Site Post Code | DA12 5AW                     |
| Grid Reference | TQ 649724 / TQ 6492272413    |
| OS (X)         | 564922                       |
| OS (Y)         | 172413                       |

### 3 SOURCES OF UXO CONTAMINATION

3.1 Through the use of thorough research (utilising both modern and historic data) EOD Contracts Ltd deem that the main source of UXO contamination pertaining to the site are as follows.

- Air delivered ordnance bombs and sub munitions/incendiaries.

## 4 KEY FINDINGS

- 4.1 Based on the information researched by EOD Contracts Ltd for the proposed works being carried out at the Ascot Arms, Gravesend, EOD Contracts Ltd can conclude the following.
- 4.2 There are no recorded incidents of the site being the subject of bombardment throughout WW1.
- 4.3 Gravesend was the subject of heavy bombardment throughout WW2. However, the exact location of these strikes is unknown to ECL.
- 4.4 The Site area itself has remained relatively unchanged since before WW2. It also remained in full use throughout this period. Therefore, any items of ordnance that may have landed within the Site boundary most likely would not go unnoticed. However, the southwestern corner of the Site sits outside of the boundary line for the PH. Therefore, it is possible that an item of ordnance dropped within this area may have gone unnoticed.
- 4.5 There was no evidence to suggest that there was a HAA/LAA Gun Emplacement located within the Site area.
- 4.6 Therefore (to summarise) EOD Contracts Ltd deem that there is a **LOW/MEDIUM** Risk pertaining to items of UXO being located within the Site location.

## 5 RECOMMENDATIONS

- 5.1 It is recommended that the following risk mitigation strategy be executed during phases of the project indicated previously indicated as a **LOW** risk.
- 5.2 UXO safety awareness training should be given at all levels of site personnel and selected individuals on the project staff with relevant responsibilities. A competent person as part of the project safety induction course should provide the awareness training. It should be reinforced with specific safety briefings and toolbox talks to individuals involved in conducting intrusive earthworks.
- 5.3 It is recommended that the following risk mitigation strategy be executed during phases of the project indicated previously indicated as a **MEDIUM** risk.
- 5.4 Communicating the risks, all stakeholders should be made aware of the UXO situation on the site and the possible impact it may have on the project works and day to day running of the district. Clients have a legal duty under the Construction Design & Management Regulations (CDM) and Health & Safety at Work legislation to provide Designers and Contractors with project specific information needed to identify hazards and risks associated with the design and construction work. The possibility that UXO may be encountered on site falls within the category of a significant risk and as such it should be addressed as early as possible in the lifecycle of the project.
- 5.5 Further planning: the risks posed by UXO should be brought to the attention of the Project CDM Coordinators and other individuals with a responsibility for project safety and operations at the site. The matter of UXO should be considered critical to project safety and one requiring high priority action.
- 5.6 UXO safety awareness training should be given at all levels of site personnel and selected individuals on the project staff with relevant responsibilities. A competent person as part of the project safety induction course should provide the awareness training. It should be reinforced with specific safety briefings and toolbox talks to individuals involved in conducting intrusive earthworks.
- 5.7 Project overview and the responsibilities of those working on site with regard to duty of care and public safety.
- 5.8 UXO recognition and safety procedures to be followed on discovery of a suspicious object or the alarm being sounded.
- 5.9 Emergency procedures to be followed in the event of an explosion. Evacuation routes, muster stations and accounting for personnel.
- 5.10 Work permits, works methodology and specific UXO risk mitigation methods. Post-incident inspections and returning to normal works.
- 5.11 Prior to any intrusive piling or drilling commencing, UXO safety testing and appropriate clearance certification into the ground to sufficient depth to provide clearance from UXO. This can be done using a progressive drilling process or (where large numbers of piles are to be placed and ground permitting) using a vehicle borne hydraulic system to push a magnetometer into the ground to test for the presence of UXO prior to piling.
- 5.12 UXO safety monitoring of all “at risk” excavations, including geotechnical or archaeological trial pits to be conducted during the project. This should be provided by a UK Home Office Authorised EOD/UXO Contractor using qualified EOD Engineer with

specialist locators and detectors to scan the ground ahead of the excavation wherever possible.

## 6 SPECIFICALLY

- 6.1 Geotechnical investigations, percussive drilling/trial pits/window/samples, require an EOD Engineer over watch.
- 6.5 New foundations with piling should be mitigated by the insertion of a magnetometer to encompass the pile position, this would be carried out using a CPT rig (mag-cone), the expected radius of the mag-cone is 1.5m therefore multiple piles could be checked.
- 6.6 Non-Intrusive Magnetometer surveys generally prove inconclusive on “Brownfield sites”, this is due to the high ferromagnetic background, therefore this methodology is not recommended for this site and shallow excavations should be overseen by a qualified EOD Engineer. This methodology could however be used on the grassed areas within the site confines.

**Risk Map:** The below map highlights which areas still potentially pose a risk of discovering UXO. The Green shaded area requires minimum mitigation measures as previously noted. The Orange shaded area requires full UXO mitigation measures in place.



- 7.0 EOD Contracts Ltd can supply a turnkey solution to your UXO requirements. Therefore, the following mitigation strategies can be supplied for land or water-based operations:**
- 7.1** Intrusive survey using CPT (*Cone Pressure Testing*) or borehole equipment, *supplying risk mitigation to all Borehole and Pile locations, down to a maximum bomb penetration depth determined within this document.*
- 7.2** Non-Intrusive Survey using multiple array system with DGPS (*Digital Global targets be identified.*
- 7.3** Offshore, near-shore, estuarine and freshwater water environments magnetic, side scan and bathymetric supported by state-of-the-art DGPS.
- 7.4** The aforementioned surveys are supported with post processing of data and intrusive investigations if required.
- 7.5** EOD Engineer over watch using Suitably Qualified and Experienced Personnel, normally former British Army, Navy or RAF Bomb Disposal specialists.
- 7.6** Explosive Ordnance Safety Presentations.
- 7.7** EOD Contracts Ltd now offer Utility/Services Detection.



## 1.0 INTRODUCTION

### 1.1 Instruction

EOD Contracts Ltd (ECL), have been commissioned by the Client to undertake a desktop study for potential historic Unexploded Ordnance (UXO) contamination for the future works being carried out within the Highlighted areas provided within the CLIENTS drawing below (**Photo 1.1**).

**Photo 1.1:** Site location/boundary provided by Client.



### 1.2 Scope of Work

The scope of this EO Risk Assessment/Desk Study is to assess the likelihood of buried EO/UXO within the environs of "the sites", in view of further development. A further aim was to evaluate the implication from UXO contamination during any future intrusive land use.

### **1.3 Restrictions**

It must be emphasized that a desk study can only indicate the potential for UXO to be present on the site. A geophysical survey and intrusive investigation are fundamentally important to provide proof that the site is free of the UXO threat.

This study was written with the site conditions prevailing at the time of the study and no liability can be accepted for any change in the condition of the area.

Please note that our appraisal relies on the accuracy of the information contained in the documents consulted and that EOD Contracts Ltd will in no circumstances be held responsible for the accuracy of such information or data supplied.

### **1.4 Sensitive Documentation**

Information may be classified, restricted or deemed to be confidential in nature to EOD Contracts Limited, where such material has been gained a summary of the documentation has been approved.

### **1.5 Objective**

The objective of this document is to define the UXO contamination routes as defined in Unexploded ordnance (UXO) A guide for the construction industry (C681) dated July 2015 and offer remediation methodologies if required.

## **2.0 SOURCES OF INFORMATION**

Research of the site's history, with regard to military usage, bombing raids and bomb impacts has been undertaken to establish the following:

- Frequency and intensity of enemy bombing raids for the site and immediate vicinity up to 500m.
- Bomb impacts and associated damage on the Site and in the immediate vicinity.
- The potential for UXO to remain on the Site and in the vicinity.
- Records of UXO removal activities for the Site and immediate vicinity.

The main sources of information consulted include:

- EOD Contracts Ltd company records
- Ministry of Defence records
- Central and Local Government Records
- Public Records Office (Kew)
- Historic Maps and Air Photography
- Open-Source information (Internet)
- Drawing Number – Clients RED Line.

### **2.1 Ministry of Defence (MOD) Records**

33 Engineer Regiment (Explosive Ordnance Disposal) Royal Engineers is the unit responsible for maintaining the records concerning conventional Bomb incidents, reports, clearances and related UXO matters. These records are known to be incomplete and are no longer supplied. Based on in-house information released by the MOD previously, it is considered unlikely that any information released will have any significant impact on the findings of this study.

### **2.2 Attack Record Keeping**

In general, the quality and accuracy of bombing and shelling records prior to 1939 varied greatly from one region to another. Records relating to the limited air attacks on the United Kingdom are considered to be sufficiently accurate in urban areas to provide a reasonable level of confidence in determining the likelihood that an area was or was not bombed during this period. Wartime records, maps etc held within the civil archives are considerably more comprehensive than those still in existence within the MOD, where it is acknowledged that large numbers of records have been disposed of since 1945. Records from some areas, particularly rural districts or near large bodies of water should still be regarded as an incomplete picture of the extent and effect of the bombing campaign.

### **2.3 Attack Record Accuracy.**

While an Air Raid was in progress it was inevitable that mistakes would be made in the transcription of rushed verbal reports into the written records. Discrepancies did occur between the total of bombs dropped against detonations witnessed. In some cases, records were made several hours after the event and mistakes were inevitable. Some reports were drafted before the full extent of the raid had been determined which has led to significant omissions in the records. Reports of raids on rural areas were often witnessed and submitted by untrained individuals and passed through third parties before being recorded. Suspect UXB's occasionally went unreported by local farmers and

freeholders who saw the event as insignificant or were reluctant to report their findings for fear of valuable land or crops being destroyed by the authorities in their attempts to find the UXB.

## **2.4 Errors and Omissions**

The accuracy of bombing records has been shown to vary greatly; this may have been a result of the individual record keeper's expertise. Additionally, in some cases, errors occurred as a result of poor or incomplete transcription and copying. Some "errors and omissions" were intentional, designed to serve as dis-information to confuse German intelligence. So long after the event, official verification of such incidents has often proven to be impossible to obtain. At present, UXBs are found on construction sites and other locations where there had been no documentary evidence to suggest their presence. These events, although infrequent, do serve as confirmation that records cannot be considered definitive.

## **2.5 Bibliography**

The significant published documents referred to during this study are listed below:

- HO 193 series from National Archives
- HO 198 series from National Archives
- The Blitz Then and Now Volumes 1 to 3
- AA Command Colin Dobinson
- German Air Raids on Britain 1914-1918
- <https://www.newsshopper.co.uk/news/6432998.dropping-the-bomb-hell/>
- <http://www.dover-kent.com/2014-project-c/Ascot-Arms-Gravesend.html>
- <https://www.whatpub.com/pubs/GRA/295/ascot-arms-gravesend>
- <http://www.discovergravesham.co.uk/gravesend-chronology/1938-1941.html>



### 3.2 Description

**Photo 3.1:** The Site area at present is occupied by the Ascot Arms Pub. This pre-war building has a front facing car park area, as well as a rear garden.



### 3.3 Geology

The underlying geology has been inferred from the 1:50 000 published geological sheet and the British Geological Survey online viewer facility, the latter providing the most up to date mapping and definitions of geological units.

- 1:50 000 scale bedrock geology description: Lewes Nodular Chalk Formation, Seaford Chalk Formation and Newhaven Chalk Formation (undifferentiated) - Chalk. Sedimentary Bedrock formed approximately 72 to 94 million years ago in the Cretaceous Period. Local environment previously dominated by warm chalk seas.

### 3.4 Current Site Use

See **3.2 Description & Annex A**.

### 3.5 Future Works

At the time of writing this report it is understood that the site will be redeveloped. Therefore, it is assumed that the following intrusive construction works will be carried out:

**NOTE:** *The full scope of works has not been made available to ECL at the time of writing this report.*

- Geotechnical investigations, percussive drilling/trial pits/window/samples
- Removal of building foundations to natural ground level
- Foundations with large diameter rotary bored piling

## 4.0 HISTORICAL REVIEW

### 4.1 Historical Mapping & Aerial Photograph

**Annex B** contains all historic maps from which the below data has been analysed.

- Historic Map 1936 - 1938 – One building (A Public House (PH)) occupies the Site boundary, lying in the north-western corner of the Site. The PH grounds are clearly defined with the Site boundary extending into the Sports Ground.
- Aerial Photo 1947 – Although the clarity of the aerial photo isn't clear, there does not appear to be any significant changes to the Site.
- Historic Map 1954 – This map shows greater detail within the Site layout, clearly defining the Site boundary. It also gives the PH's name "Central Avenue Hotel".
- Modern-day Map 2021, the Site at present is unchanged from the previous map.

### 4.2 WWI

Although many people associate wartime bombing with The Blitz during World War II, the first airborne terror campaign in Britain took place during the First World War. Air raids in World War One caused significant damage and took many lives. German raids on Britain, for example, caused 1,413 deaths and 3,409 injuries. Air raids provided an unprecedented means of striking at resources vital to an enemy's war effort. Many of the novel features of the war in the air between 1914 and 1918—the lighting restrictions and blackouts, the air raid warnings and the improvised shelters—became central aspects of the Second World War less than 30 years later. The East End of London was one of the most heavily targeted places. Poplar, in particular, was struck badly by some of the air raids during the First World War. Initially these were at night by Zeppelins, which bombed the area indiscriminately, leading to the death of innocent civilians.

The first daylight bombing attack on London by a fixed-wing aircraft took place on 13 June 1917. Fourteen German Gotha G bombers led by Squadron Commander Hauptmann Ernst Brandenburg flew over Essex and began dropping their bombs. It was a hot day, and the sky was hazy; nevertheless, onlookers in London's East End were able to see 'a dozen or so big aeroplanes scintillating like so many huge silver dragonflies'. These three-seater bombers were carrying shrapnel bombs, which, were dropped just before noon. Numerous bombs fell in rapid succession in various districts. In the East End alone 104 people were killed, 154 seriously injured and 269 slightly injured.

The gravest incident that day was a direct hit on a primary school in Poplar. In the Upper North Street School at the time were girls' class on the top floor, a boys' class on the middle floor and an infant class of about 50 students on the ground floor. The bomb fell through the roof into the girls' class; it then proceeded to fall through the boys' classroom before finally exploding in the infant class. Eighteen students were killed, of whom sixteen were aged from 4 to 6 years old. The tragedy shocked the British public at the time.

**Annex C** is a map of the bomb incidents for England throughout this period; it does indicate that Gravesend was the subject of bombing throughout this period, ECL could not find any evidence to suggest that the Site was targeted.

## **4.3 WWII**

### **4.4 The Blitz Around Britain**

The 'Blitz' – from the German term Blitzkrieg ('lightning war') – was the sustained campaign of aerial bombing attacks on British towns and cities carried out by the Luftwaffe (German Air Force) from September 1940 until May 1941.

The Blitz began on 7 September, 'Black Saturday', when German bombers attacked London, leaving 430 dead and 1,600 injured. London was then bombed for 57 consecutive nights, and often during daytime too. London experienced regular attacks and on 10-11 May 1941 was hit by its biggest raid. German bombers dropped 711 tons of high explosive and 2,393 incendiaries. 1,436 civilians were killed. However, this proved to be the last major raid until January 1943.

While London was bombed more heavily and more often than anywhere else in Britain, the Blitz was an attack on the whole country. Very few areas were left untouched by air raids. In relatively small compact cities, the impact of a severe air raid could be devastating.

From mid-November 1940, major provincial cities and industrial centres were targeted. In early 1941 another wave of attacks began, primarily against ports. Respite finally came from June when much of the Luftwaffe was directed against Russia and targets in the Mediterranean.

### **4.5 Gravesend during the War**

Gravesend industries were heavily involved in production during the Second World War and as a result the town became a prime target for enemy bombers

When the Second World War started in September 1939, there was a period of inactivity when little happened.

The Government believed German bombers would cause tremendous damage to property and civilians in this time. Such was the fear of a German bombing campaign, the Government ordered millions of cardboard coffins to cater for expected casualties. Needless to say, those figures never materialised, and to avoid embarrassment, all the cardboard coffins were ordered to be burned after the war.

It is easy to see why the Germans would target Gravesend. Factories and industrial sites in the area included Bevan Cement Works, in Northfleet; Bowaters, which used part of its factory for machining and assembling Bofors 40mm light anti-aircraft guns. There was also Red Lion Wharf, in Northfleet, where the Maunsell Sea Forts were built. The WT Henley Telegraph Works not only produced 14 million gas masks, but also millions of components for the three-inch mortar. It also supplied a range of soldering irons, connectors and wiring for Radar installations. The PLUTO piping for pumping fuel under the Channel following the Normandy invasion was also made there.

Essex Aero Ltd, which had three sites at Queen Street, the Canal Basin and Gravesend Airport, manufactured magnesium alloy fuel and oil tanks for the Spitfire, Sunderland and Shetland flying boats and jigs for the manufacture of 3.7ins heavy anti-aircraft guns. Gravesend Airport, in Thong Lane, was home to 35 RAF squadrons.

In addition to acting as a satellite station to RAF Biggin Hill, it became RAF Gravesend in its own right in 1940. There was also the Cooling Radio Station on the Cooling Marshes, which apart from relaying telephone calls between Winston Churchill and President Roosevelt, acted as a secret radio station to locate any enemy submarines.

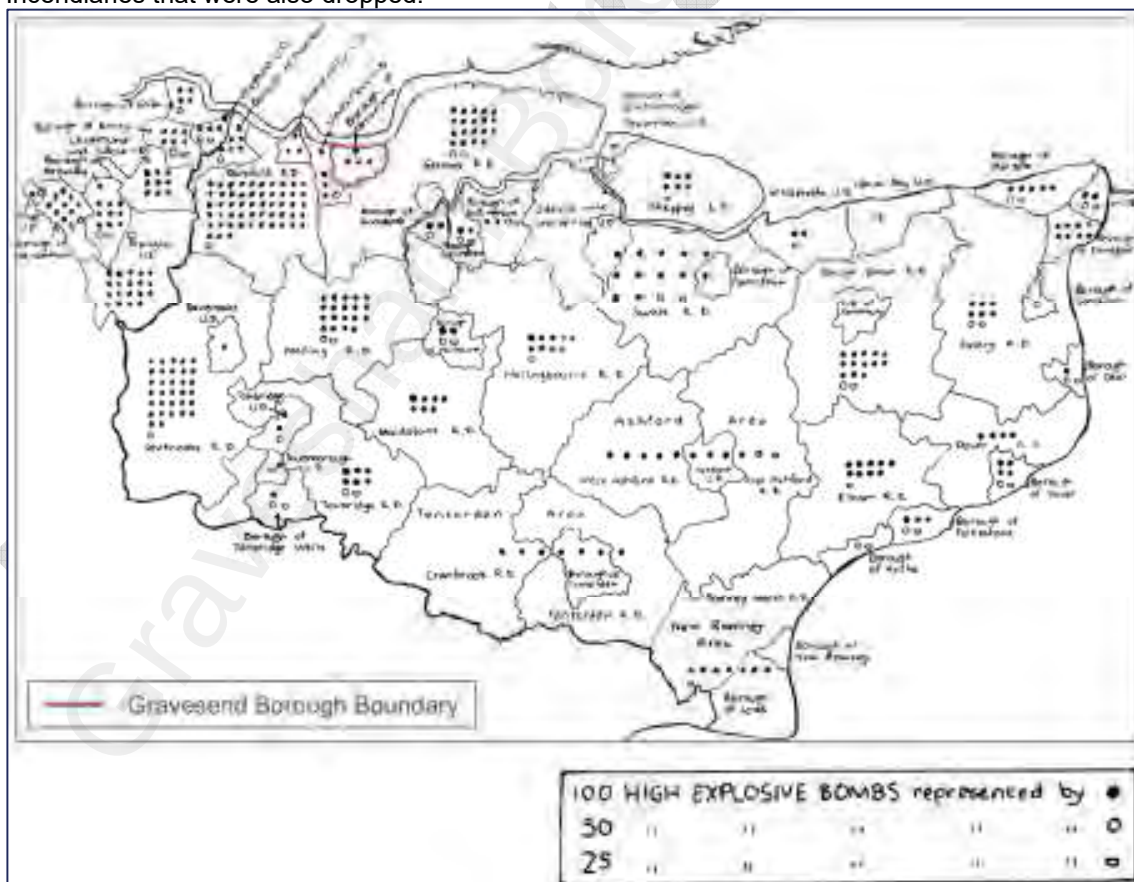
On June 6, 1940, Northfleet was subjected to what was believed to be the first incendiary-bomb raid on a built-up area in England. More than 1,500 incendiary bombs were dropped. Gravesend was not visited until August 16, 1940.

That day, August 16, a number of German aircraft dropped 108 high-explosive bombs on Colyer Road Comprehensive School, the lower end of Waterdales, Preston Road, Detling Road, London Road, and Bowaters Paper Mill, causing much damage. Rosherville School was badly damaged. In all, 29 people were killed, 18 seriously and nine slightly injured.

During the war, Gravesend had the highest number of incendiary bombs dropped in its boundaries.

In Gravesend, 38 people were killed. There were 81 serious and 202 slight injuries, 45 properties were wrecked, 212 were severely damaged, and 7,799 slightly damaged.

**PHOTO 4.1:** Highlighted below is a map of Kent which highlights only the HE bombs that were dropped within its counties. Compared to some areas Gravesend sustained a relatively low amount of HE Bombs (300 (approximately) in all). This map doesn't however include the large amount of Incendiaries that were also dropped.



#### 4.6 Abandoned Bombs/UXO

EOD Contracts records could find no evidence of any items of UXO abandoned in or around the subject site.

#### 4.7 Anti-Aircraft Artillery

There is no evidence to suggest there was a HAA Gun Emplacement within the Site location.

#### 4.8 Prior Clearance Operations

EOD Contracts could find no evidence to suggest that there have been any prior UXO clearance operations in or around the site footprint.

#### 4.9 V1 & V2 Bomb strikes

The Site itself was not struck by one of these weapons, with the closest being northeast of the Site on Portland Avenue. This incident took place on November 13<sup>th</sup> 1944 leaving 5 people dead.

### 5.0 SOURCES OF UXO CONTAMINATION

The main source of UXO contamination that are deemed a threat to the Site are:

- Air delivered ordnance bombs and sub-munitions/incendiaries.

#### 5.1 GENERAL

EOD Contracts conclude that a **LOW/MEDIUM** risk is considered to exist with respect to UXO for areas within the site footprint.

- The Site and its surrounding area are not covered by the HO 193 bomb mapping series that covers the UK. Therefore, the exact location of where bombs landed within Gravesend is not known.
- The Site was in full use throughout this period, and the building that sits within the Site location has been there prior to WW2. There has been minimal construction works carried out post WW2.

UXOs are essentially dangerous; therefore, further information on UXO and Safety is detailed in **Annex E**.

#### 5.2 BOMB PENETRATION DEPTHS

#### 5.3 Weapon Sub-surface Penetration.

Weapons penetrate a significant depth into the ground and other types of ammunition are designed to permit the weapon time to penetrate deeply into the target before detonating a short time after coming to rest or a considerable number of hours afterwards. The second reason is where the weapon has failed to function as designed becoming a UXB. A number of studies have been carried out into weapon penetration and it is an inevitable consequence of a number of variable factors acting on the bombs trajectory that figures can and do differ significantly. Careful consideration must be given to the weapon's

velocity, trajectory and shape. Also surface conditions and subsurface geology. The largest of the common German bombs, (500kg) can penetrate to significant depths given favourable conditions for penetration. In the case of projectiles and shells, the potential for deep penetration is significantly less.

#### 5.4 Penetration Assumptions.

A number of assumptions were used in determining the maximum threat depth within the project footprint, which were.

#### 5.5 Factors Affecting Penetration

The penetration of sub-surface bombs will be affected by the following:

- Height of release
- Weight, shape and design of bomb
- Aerodynamic qualities
- Angle of flight and impact
- Nature of impact surface
- Nature of sub soil

The expected bomb depths for the site assuming the following criteria:

- 15,000 feet, the vast majority of bombs were dropped from height to avoid AA fire and balloons
- General Purpose Bombs of 50kg to 1000kg
- Near Vertical impact 80 to 90 degrees
- Surface geotechnical conditions are made ground
- Subsurface geotechnical conditions are generally clays.

Therefore, the expected depths for Air dropped UXBs on site are indicated in **RED** in the following table:

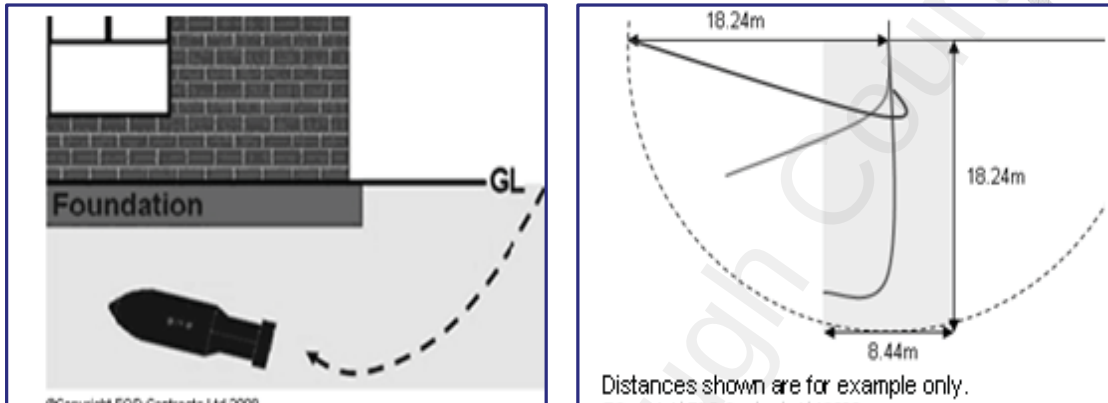
**TABLE 5.1: Bomb Penetration Depths**

| Sub Soil Type      | Bomb Weights   |                |              |                |
|--------------------|----------------|----------------|--------------|----------------|
|                    | 50kg           | 250kg          | 500kg        | 1000kg         |
| Soft Rock          | 2.442          | 5.016          | 6.006        | 7.062          |
| Gravel             | <b>2.442</b>   | <b>5.016</b>   | <b>6.006</b> | <b>7.062</b>   |
| Sand               | <b>2.442</b>   | <b>5.016</b>   | <b>6.006</b> | <b>7.062</b>   |
| Chalk              | 3.7            | 7.6            | 9.1          | 10.7           |
| Shingle            | 3.7            | 7.6            | 9.1          | 10.7           |
| Dry Clay           | <b>3.7</b>     | <b>7.6</b>     | <b>9.1</b>   | <b>10.7</b>    |
| Wet Sand           | 5.55           | 11.4           | 13.65        | 16.05          |
| Wet Clay           | 5.55           | 11.4           | 13.65        | 16.05          |
| Average Offset (m) | <b>0.8-1.6</b> | <b>1.6-3.7</b> | <b>3-4.5</b> | <b>3.4-5.3</b> |

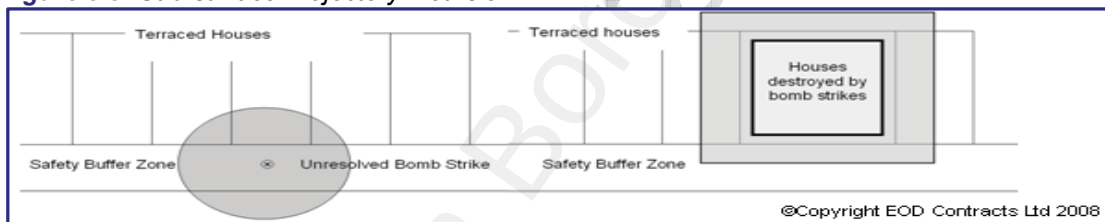
Bombs on penetration of the surface do not follow a straight-line trajectory they can and do curve; this is called a “J” curve where the bomb’s path bends back towards the surface. This gives what is known as the Offset, which may place a bomb under a structure and at a shallow depth.

### Figure 5.1 – 5.3: Sub-Surface Trajectories & Safety Buffers

**Figure 5.1:** Common Sub-Surface Trajectory & **Figure 5.2:** Anomalous Sub-Surface Trajectory



**Figure 5.3:** Sub-surface Trajectory Incursion



**NOTE:** the common sub-surface trajectory will follow a path best described as a ‘J’ curve. The curve can result in a weapon coming to rest some distance from its impact point. The distance from impact point to resting place is referred to as the “Off set Distance and is normally considered to be 1/3 of the depth. This mechanism can permit a weapon to strike outside a building and travel below ground finally coming to rest within the building footprint. Where a strike is known to have occurred close to a building or structure such as a dock wall, a danger zone should be considered to exist around the area of the strike of sufficient size to accommodate the likely sub-surface travel distance for the weapon.

**NOTE:** the typical offset distance is shown as the shaded area, on rare occasions a near surface deflection of the weapon can occur and the offset distance can be substantially increased up to 5/4 of the penetration depth. This mechanism does however reduce the penetration depth considerably with the net result that while the offset is increased the overall travel distance is for the most part unaffected.

**NOTE:** scenario 1 (Figure 5.1) shows a hypothetical bomb strike outside a structure or building. The strike location has been accurately identified and as a consequence; a potential danger zone (circular shaded area) can be placed around the point of impact. Scenario 2 shown top right; depicts a direct HE bomb or Incendiary strike within a building which totally destroyed the building. In circumstances such as this UXB entry the building rubble may have concealed hole and the weapon may still be present within the building footprint or it may have travelled sub-surface and come to rest outside the footprint. Here the danger zone (square shaded Area) extends outwards on all sides of the original building footprint.

## **5.6 Recent UXO finds within the UK**

The present-day threat of finding items of UXO within the UK is still high, as highlighted within **Annex E**.

EOD Contracts Ltd  
Gravesend Council

## 6.0 RISK ASSESSMENT

### 6.1 Risk Assessment

Assessing both the likelihood of occurrence and the consequences of the encounter has derived the overall risk for the site from unexploded ordnance. Review of the site's history and geographic location can provide an overall likelihood of encounter factor, which is used in the subsequent determination of a risk level when a Figure can be determined for the consequence.

### 6.2 Likelihood of Encounter

Given the study findings and other criteria (See **Annex F** Tables) it is considered that there is a **LOW/MEDIUM** risk of encountering UXO within the site footprint. This finding is based on assessment of all of the available information.

### 6.3 Consequence of Encounter

The consequence (See **Annex D**) of an uncontrolled encounter with UXO, given its lethal design and its unpredictable nature could be catastrophic and warrants a high severity factor. With regards to the consequences, the following factors were considered:

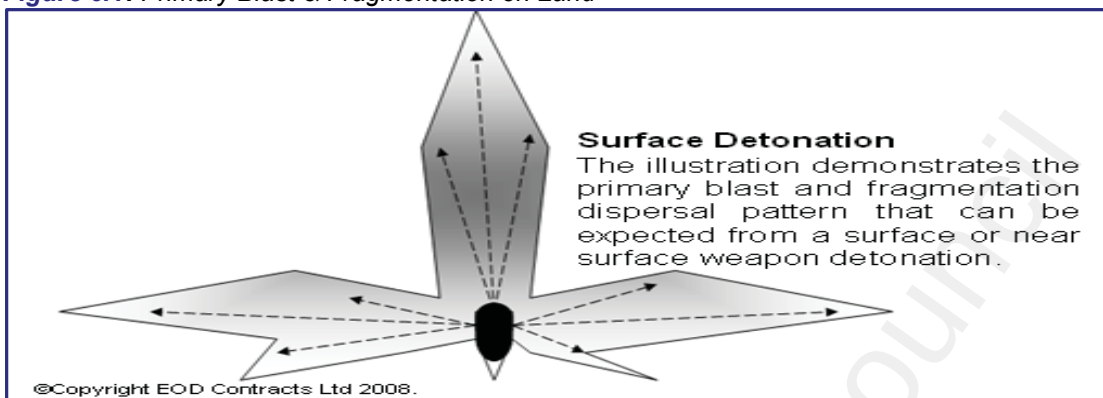
The project works may make use of a number of common ground investigation and construction techniques in its methodology during the project. Any intrusive groundwork has the potential to encounter UXO.

Intrusive earthwork, piling driving and dynamic ground compaction are by nature, aggressive, significant force (kN) is often required to achieve the desired results. As a precaution it is prudent to assume that any external stimulus, no matter how slight, may result in an unstable weapon detonating.

Records of encounters with UXO, particularly where plant machinery has been involved have resulted in detonations of the items with varying degrees of consequence; ranging from slight injuries sustained to piling contractors when a bomb detonated at 6.0m bgl to fatal injuries sustained to a construction worker while conducting near surface machine works on a motorway.

Detonation on land; the effects of a detonation at depth will be more localised and less destructive than one occurring on the surface. Figure 6.1 shows an illustration of the primary blast and fragmentation dispersal from explosive ordnance when it detonates on the surface. The weapon's design, and other key factors such as the ratio of explosive charge weight to total weapon weight (CWR) and the Net Explosive Quantity (NEQ) will determine the size and effects of a blast. The effects will also be enhanced or reduced by a number of factors including, the presence of other energetic materials in close proximity to the blast or if the weapon is buried or exposed on the surface. As a guide Figure 6.1 gives an indication of the likely blast radius for common types of UXO.

**Figure 6.1: Primary Blast & Fragmentation on Land**



In addition to the dangers of explosion, many common chemicals used in the manufacture of explosive ordnance fillings are; in sufficient quantity, and level of exposure, toxic or poisonous. Although it is unlikely that such chemicals would be encountered in significant quantity to represent a significant risk to personnel, leakage or venting could pose a risk to the local marine environment. In addition to heavy metals; copper, lead, zinc etc used in the weapon body and fuze, hydrocarbon propellants such as Kerosene may also be present.

#### **6.4 Risk Level**

The overall risk has been determined to apply to all of the ground within the site footprint.

The prevailing risk level has been determined to be **LOW/MEDIUM** risk.

#### **6.5 Encounter Consequences**

It is acknowledged that when viewed from a “likelihood versus consequence” scenario; the consequences of an explosion may have the potential to include:

- Multiple casualties or fatalities.
- Extensive damage to high value private and public assets and property.
- Significant delays to the construction project.

#### **6.6 Those at Risk**

The risk is considered to have the potential to pose a direct and indirect threat to a wide range of individuals and facilities. While the impact on fixed assets can be estimated based on the asset's proximity to the seat of the explosion. The impact to transient assets and people will, for the most part, be the result of both; proximity to the explosion and the time at which the event occurs. The overall impact therefore has the potential to range from little more than a minor localised event to a level, which may be considered to be a more widespread major incident involving some or all of the following:

- Construction and other specialist personnel carrying out the work.
- General public in open spaces, at their places of work and transient population on foot or road users in proximity to the construction work.
- Public services including transport, water, gas and electricity supplies.

- Public facilities, including buildings, vehicles, other high value assets and equipment.
- Private business property including construction equipment.
- Private residential property in proximity to the work.

## 6.7 At Risk Activities

Based on our understanding of the scope of the most common construction projects, it is considered that a wide range of intrusive processes may be required to complete the project. Any intrusive groundwork's have the potential to encounter UXO and each activity therefore has a degree of risk attached to it. The severity or level of the risk is derived as a consequence of activity's; location, methodology and volume or quantity of risk material to be worked, at risk activities are considered to include:

- Intrusive geotechnical and archaeological investigations including drilling and pitting.
- Foundation construction, trenching and other excavations.
- Intrusive construction works, which may include piling. The study findings and other criteria (See [Annex F](#) Tables) it is considered that there is a **LOW/MEDIUM** risk of encountering UXO within the site footprint.

## 7.0 CONCLUSIONS

Based on the information researched by EOD Contracts Ltd for the proposed works being carried out at the Ascot Arms, Gravesend, EOD Contracts Ltd can conclude the following.

There are no recorded incidents of the site being the subject of bombardment throughout WW1.

Gravesend was the subject of heavy bombardment throughout WW2. However, the exact location of these strikes is unknown to ECL.

The Site area itself has remained relatively unchanged since before WW2. It also remained in full use throughout this period. Therefore, any items of ordnance that may have landed within the Site boundary most likely would not go unnoticed. However, the southwestern corner of the Site sits outside of the boundary line for the PH. Therefore, it is possible that an item of ordnance dropped within this area may have gone unnoticed.

There was no evidence to suggest that there was a HAA/LAA Gun Emplacement located within the Site area.

Therefore (to summarise) EOD Contracts Ltd deem that there is a **LOW/MEDIUM** Risk pertaining to items of UXO being located within the Site location.

## 8.0 RECOMMENDATIONS

It is recommended that the following risk mitigation strategy be executed during phases of the project indicated previously indicated as a **LOW** risk.

UXO safety awareness training should be given at all levels of site personnel and selected individuals on the project staff with relevant responsibilities. A competent person as part of the project safety induction course should provide the awareness training. It should be reinforced with specific safety briefings and toolbox talks to individuals involved in conducting intrusive earthworks.

It is recommended that the following risk mitigation strategy be executed during phases of the project indicated previously indicated as a **MEDIUM** risk.

Communicating the risks, all stakeholders should be made aware of the UXO situation on the site and the possible impact it may have on the project works and day to day running of the district. Clients have a legal duty under the Construction Design & Management Regulations (CDM) and Health & Safety at Work legislation to provide Designers and Contractors with project specific information needed to identify hazards and risks associated with the design and construction work. The possibility that UXO may be encountered on site falls within the category of a significant risk and as such it should be addressed as early as possible in the lifecycle of the project.

Further planning: the risks posed by UXO should be brought to the attention of the Project CDM Coordinators and other individuals with a responsibility for project safety and operations at the site. The matter of UXO should be considered critical to project safety and one requiring high priority action.

UXO safety awareness training should be given at all levels of site personnel and selected individuals on the project staff with relevant responsibilities. A competent person as part of the project safety induction course should provide the awareness training. It should be reinforced with specific safety briefings and toolbox talks to individuals involved in conducting intrusive earthworks.

Project overview and the responsibilities of those working on site with regard to duty of care and public safety.

UXO recognition and safety procedures to be followed on discovery of a suspicious object or the alarm being sounded.

Emergency procedures to be followed in the event of an explosion. Evacuation routes, muster stations and accounting for personnel.

Work permits, works methodology and specific UXO risk mitigation methods. Post-incident inspections and returning to normal works.

Prior to any intrusive piling or drilling commencing, UXO safety testing and appropriate clearance certification into the ground to sufficient depth to provide clearance from UXO. This can be done using a progressive drilling process or (where large numbers of piles are to be placed and ground permitting) using a vehicle borne hydraulic system to push a magnetometer into the ground to test for the presence of UXO prior to piling.

UXO safety monitoring of all “at risk” excavations, including geotechnical or archaeological trial pits to be conducted during the project. This should be provided by a UK Home Office Authorised EOD/UXO Contractor using qualified EOD Engineer with specialist locators and detectors to scan the ground ahead of the excavation wherever possible.

## 9 SPECIFICALLY

Geotechnical investigations, percussive drilling/trial pits/window/samples, require an EOD Engineer over watch.

New foundations with piling should be mitigated by the insertion of a magnetometer to encompass the pile position, this would be carried out using a CPT rig (mag-cone), the expected radius of the mag-cone is 1.5m therefore multiple piles could be checked.

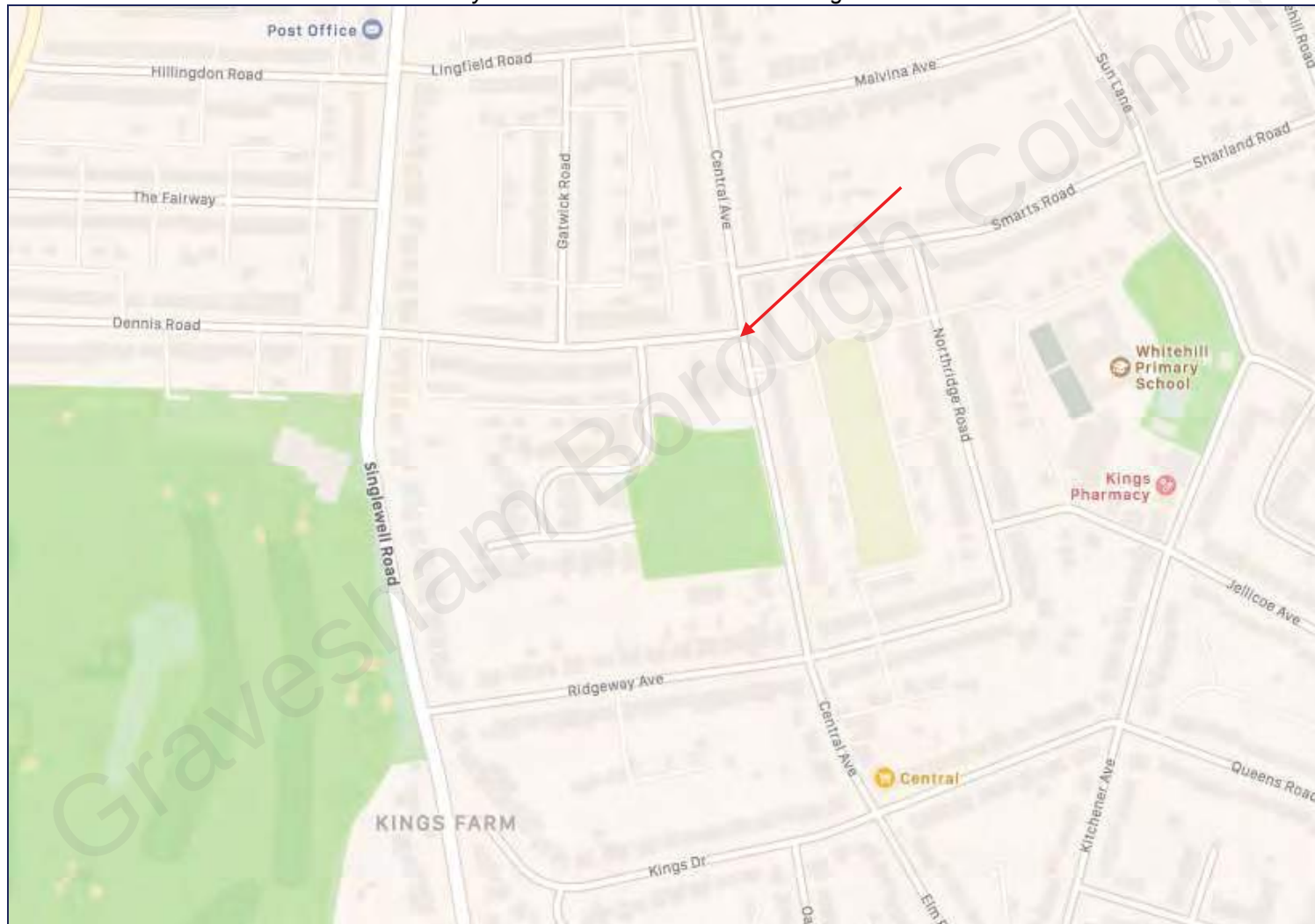
Non-Intrusive Magnetometer surveys generally prove inconclusive on “Brownfield sites”, this is due to the high ferromagnetic background, therefore this methodology is not recommended for this site and shallow excavations should be overseen by a qualified EOD Engineer. This methodology could however be used on the grassed areas within the site confines.

**Risk Map:** The below map highlights which areas still potentially pose a risk of discovering UXO. The Green shaded area requires minimum mitigation measures as previously noted. The Orange shaded area requires full UXO mitigation measures in place.



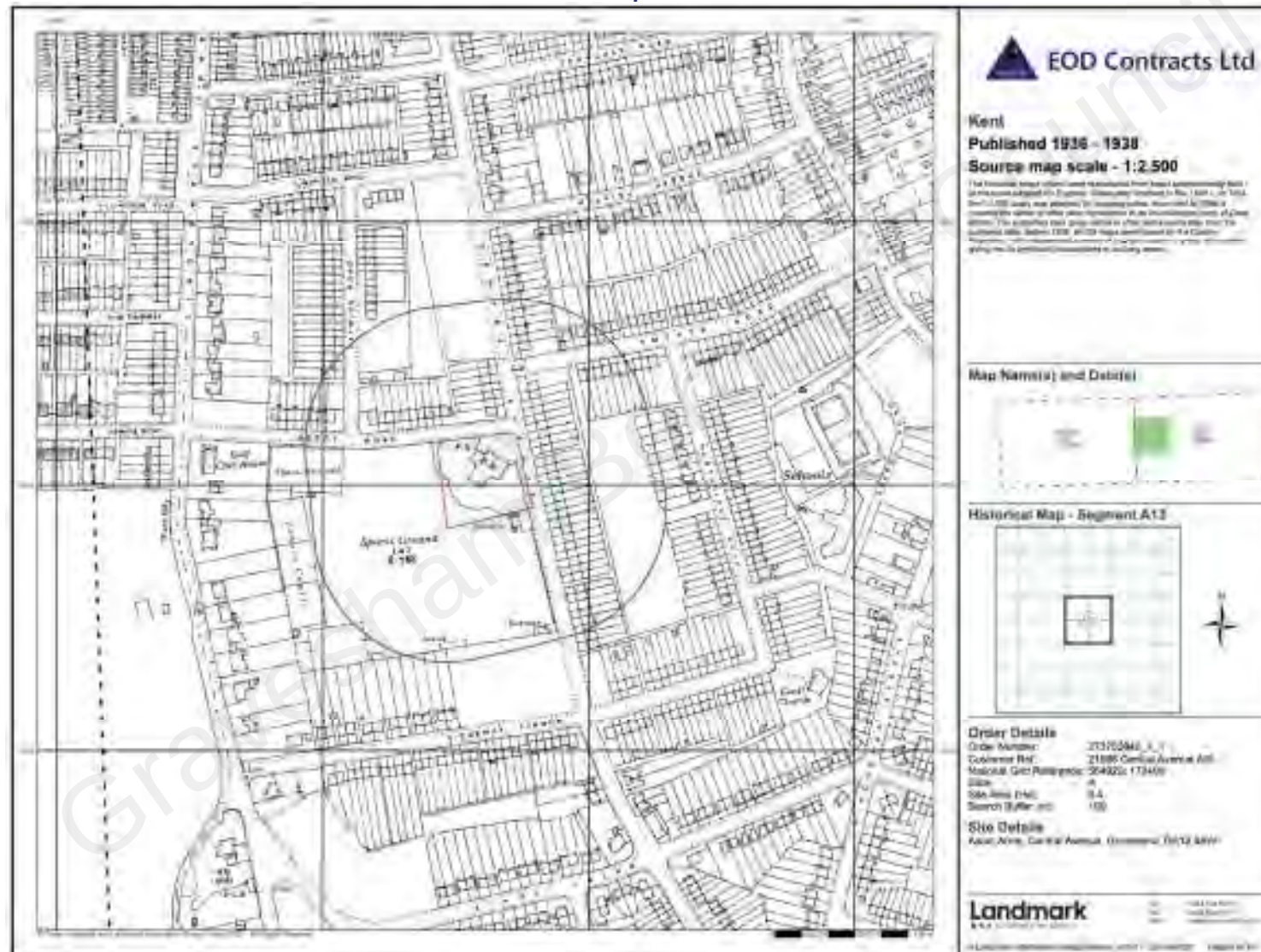
## SITE LOCATION

**NOTE:** Site indicated by red border. Access to the Site is gained via Swallow Road.

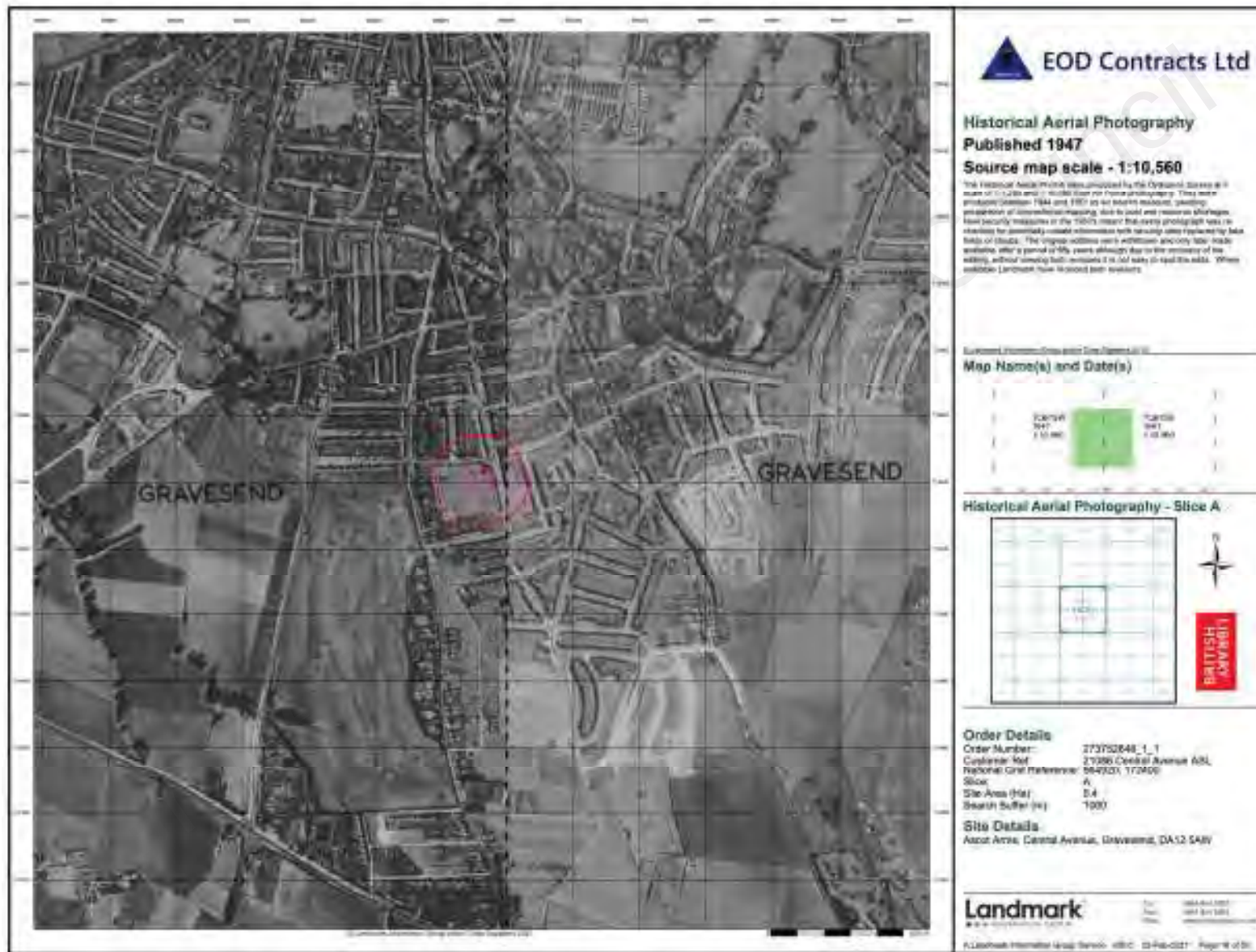


## HISTORIC MAPPING

### Historic Map 1936 - 1938



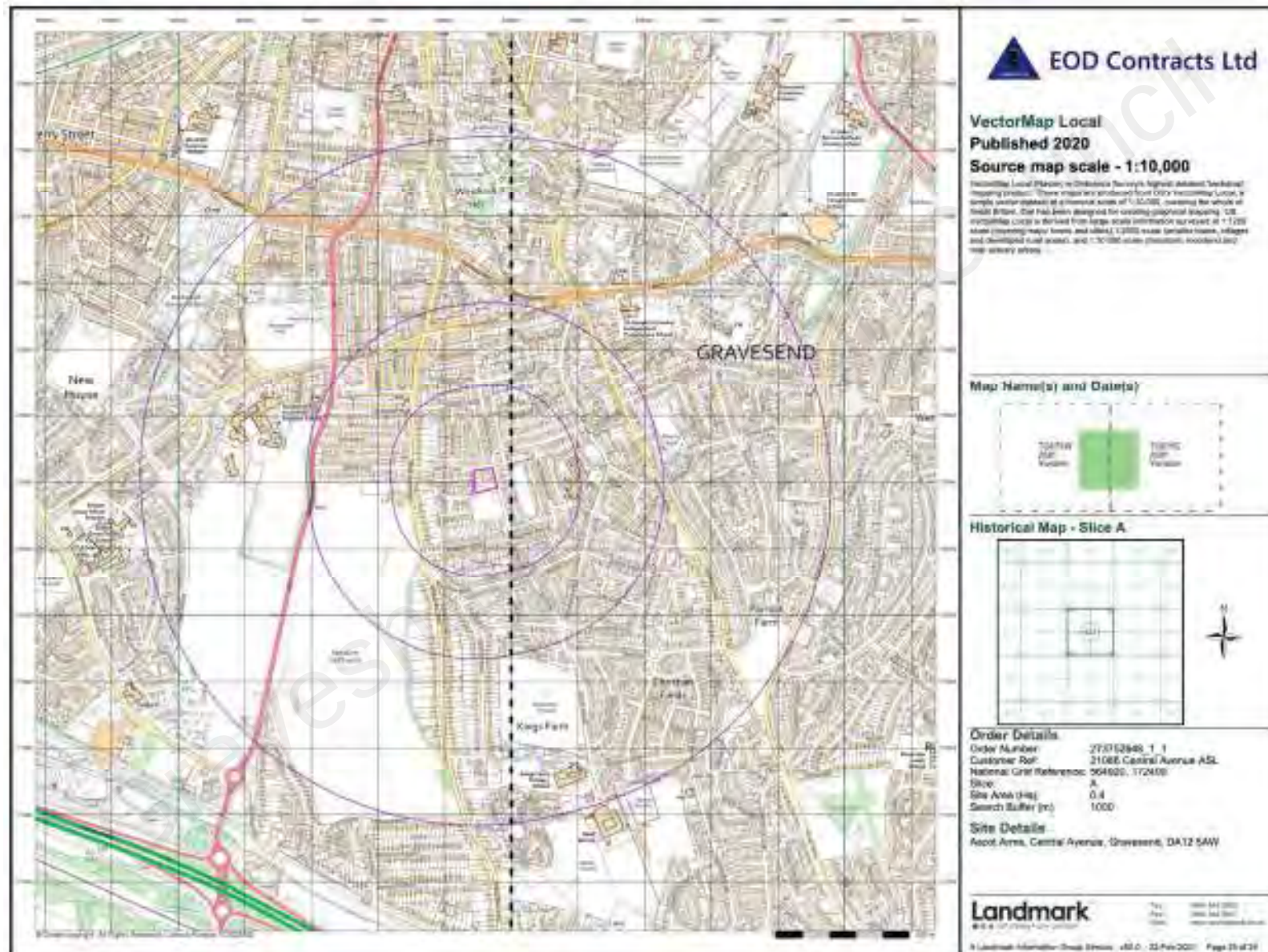
### Historic Post WW2 Aerial Photo 1947



## B - 3



**Modern Day Map 2021**



[illegible]

© 2021 EOD Contracts Ltd. Company Registration Number 4483560  
C - 1

## EXPLOSIVE ORDNANCE SAFETY AND INFORMATION

### UNEXPLODED ORDNANCE

Since the end of WWII, there have been a limited number of recorded incidents in the UK where bombs have detonated during engineering works, though a significant number of bombs have been discovered.

The threat to any proposed investigation or development on the site may arise from the effects of a partial or full detonation of a bomb or ordnance item. The major effects usually being shock, blast, heat and shrapnel damage. It should be noted that the detonation of a 50kg buried bomb could damage brick/concrete structures up to 16m away and unprotected personnel on the surface up to 70m away from the blast. Larger ordnance is obviously more destructive. Table 1 denotes recommended safe distance for UXO.

**Table 1: Safety Distances for Personnel**

| UXO (Kg) | Safety Distances (m) |             |            |             |
|----------|----------------------|-------------|------------|-------------|
|          | Surface UXO          |             | Buried UXO |             |
|          | Protected            | Unprotected | Protected  | Unprotected |
| 2        | 20                   | 200         | 10         | 20          |
| 10       | 50                   | 400         | 20         | 50          |
| 50       | 70                   | 900         | 40         | 70          |
| 250      | 185                  | 1100        | 120        | 185         |
| 500      | 200                  | 1250        | 140        | 200         |
| 1000     | 275                  | 1375        | 185        | 275         |
| 3000     | 450                  | 1750        | 300        | 450         |
| 5000     | 575                  | 1850        | 400        | 575         |

Explosives rarely become inert or lose effectiveness with age. Over time, fuze mechanisms can become more sensitive and therefore more prone to detonation.

This applies equally to items that have been submersed in water or embedded in silt, clay, peat or similar materials.

Once initiated, the effects of the detonation of the explosive ordnance such as shells or bombs are usually extremely fast, often catastrophic and invariably traumatic to the personnel involved.

The degradation of a shell or bomb may also offer a source of explosive contamination into the underlying soils. Although this contamination may still present an explosion hazard, it is not generally recognised that explosives offer a significant toxicological risk at concentrations well below that at which a detonation risk exists.

### TYPES OF ORDNANCE

**German Air Delivered Ordnance.** Technical information on the nature and characteristics of the ordnance used by the German Air Force during both world wars has been available for a number of years. Assessment that began during the 1930's has continued to the present day. Experts have conducted research in many countries as part of national research programmes and as individual research projects. Consequently, a well-informed assessment of the threat posed by unexploded

ordnance, and the hazards that they represent, can be made with a high degree of confidence.

**Terminology.** It should be noted that two terms used in bomb records can lead to some confusion as to their meaning and therefore significance. The term Unexploded Bomb (UXB) refers to a bomb that has fallen, failed to function and has been subsequently dealt with and removed from the site. The term Abandoned Bomb (A/UXB) refers to a UXB that could not be found or recovered, or the decision was taken not to pursue the matter further. Consequently the unexploded bomb remains where it came to rest when it was dropped or fell to the present day. It should also be noted the word 'bomb' can be used to describe an airdropped bomb or a shell as in some cases no differentiation was made and the term was interchangeable.

**Abandoned Bombs.** The records of known abandoned unexploded bomb locations in the London area were released in response to a written Parliamentary Question from Simon Hughes. (Hansard: Volume; 282. Dated 15<sup>th</sup> October 1996). The information was provided by the Ministry of Defence (MOD) and supplied under an indemnity.

**Explosive Ordnance Failure Rates.** Over the course of both World Wars a considerable quantity of ordnance dropped on UK targets failed to function as designed and subsequently penetrated the ground without exploding. Information gathered during the war by the MOD and its research partners provide typical failure rates for different types of ordnance. Figures significant to this study are:

- 10% of all German airdropped bombs failed to function as intended.
- 30% of all anti-aircraft and other types of shells failed to function as intended.

**Deductions & Considerations.** The following points were considered as part of the assessment and have been given due consideration:

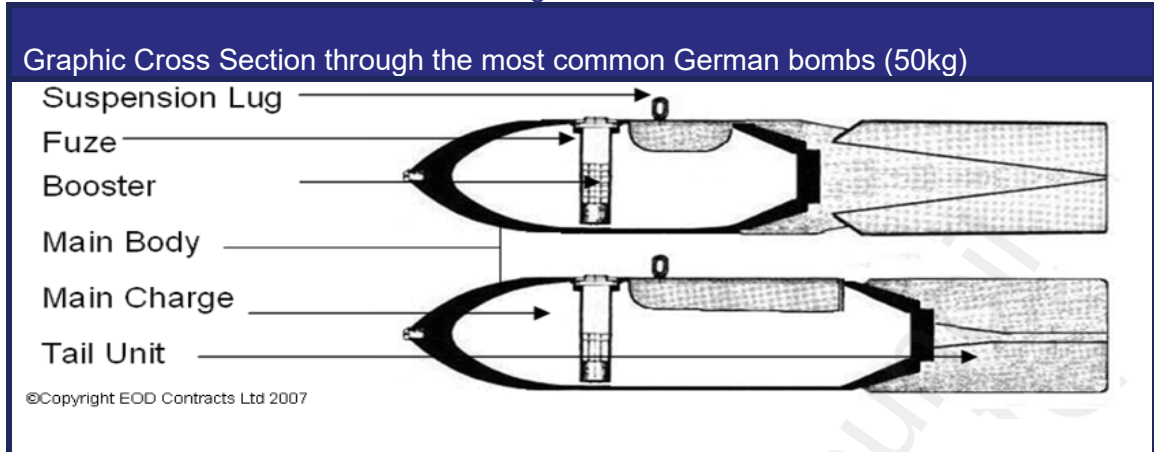
Records were found that indicated that the general area was subjected to heavy bombing.

Bombs, which struck previously, hit or burned out targets and did not function; consequently their impact was unseen and therefore no report was ever made.

In all likelihood, the local anti-aircraft battery would have fired a far higher number of shells than the bombers dropped HE bombs. Contamination by anti aircraft shells cannot be rules out.

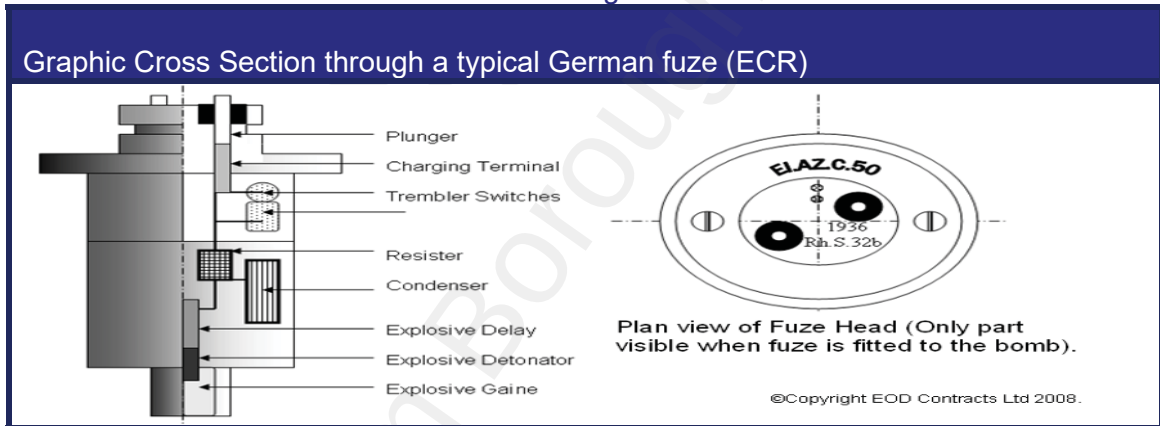
**Generic German Bomb Types.** The majority of German bombs dropped were 50kg in weight, accounting for approximately 16% of the total bombs dropped. The range of common bombs increased in weight to a maximum of 1700kg. Regardless of size, German bombs were fitted with one or more Electrical Condenser Resistance (ECR) fuzes many of which included a mechanical component. The fuzes were mounted transversely in the bomb body with the booster directly below, and in contact with, the fuze. The booster; sometimes referred to as the Gaine, is composed of a sensitive explosive material (Picric Acid). Picric Acid is known to deteriorate over time becoming increasingly unstable. The internal layout of two common German bombs and a German fuze is shown in Figures 6.1 & 6.2.

**FIGURE 1: Generic German Bomb Design.**



**NOTE:** the diagram shows that there can be a significant difference in the quantity of High Explosive contained within bombs of similar size and shape; the Grade 1 bomb on the bottom having 30% more HE than the Grade 2 shown at the top. This serves to demonstrate the importance of an accurate identification of any item of UXO.

**FIGURE 2: Generic German Bomb Fuze Design.**



**FIGURE 3:** Range of HE bombs dropped on the United Kingdom.



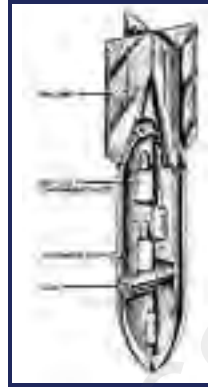
**NOTE:** The smaller sub-munitions (Bomblets) seen to the right, ranged in size between 1 and 3kg, were dropped in large numbers and were intended as incendiary bombs, anti-personnel bombs or as bombs filling both roles. The smaller bomblets were dropped in larger container bombs designed to hold between 360 and 620 of the bomblets. The containers were designed to burst open at a predetermined height above ground level, dispersing the bomblets over a wide area. Air raid damage was far greater by using both incendiary, and HE bombs on a single raid. The fires started by the incendiaries being rapidly spread by the blast waves from the HE bomb. This scenario was shown to devastating effect on the 14<sup>th</sup> February 1945 in the German city of Dresden. Where fires started and spread by the bombing increased to a point where the oxygen was being sucked into the flames at such a high speed that the fire became a “Fire Storm”. At the time the city's population had increased due to a high number of refugees fleeing the Russian advance to the east, the exact civilian death toll from fire and suffocation will never be known, but is considered to be somewhere between 25,000 and 100,000.

**High Explosive (HE) Bomb.** Some of the most common type of ordnance to be dropped on the United Kingdom, HE bombs are often the type encountered as UXBs. Relatively thick cased, they are still recovered in remarkably good condition. Ranging in size from 50 to 1700 kg, their typical release height (1,500m) allowed them to penetrate deep into the ground as a result of design or flaw. Towards the end of the bombing campaign, as steel became scarce the German Engineers produced a range of bombs that used steel reinforced concrete as the bomb body. Figure 6.3 shows the range of steel HE bombs dropped on the UK.

**Incendiary Bomb.** The larger incendiary bombs, containing bottles of white phosphorus and an incendiary mixture contained within a thin steel case were designed to burst on contact with the ground. A fixed dispenser on the aircraft delivered the smaller type of bomb or ‘Bomblet’ to the target area in container bombs or; both types of container would open dispersing the smaller Incendiary bombs. Relatively small and light they were unlikely to penetrate the ground to any significant depth. However, once concealed in bomb damage rubble or below water they were easily missed and are still unearthed today from in-fill and drained land. Later versions of the incendiary bomb contained an additional explosive charge used as a short delay “Booby Trap” device that contained a significant amount of high explosive. The Booby Trap component was designed to kill or injure fire fighters and hinder the damage control. See Figure 4.

#### FIGURE 4: Incendiary Bombs.

##### Common German Incendiary Bombs



Left, 1kg incendiary bomblet, and right a 50kg incendiary bomb containing bottles of white phosphorus.

**NOTE:** Incendiary bomblets were made of a flammable alloy similar in appearance to aluminium, which resists corrosion well. The tail unit was made of thin tin-plate steel and is more prone to have rusted away. Some Incendiary models were fitted with a High Explosive (HE) steel nose. With the tail and explosive nose attached the bomb was 480mm long.

**Blast Bomb / Parachute Mine.** The parachute mine was extensively used on land and at sea and was fitted with specialist fuzes designed to trigger the weapon at a predetermined altitude, water depth or to switch on other magnetic influence mechanisms to trigger the weapon when a ship approached (Magnetic or Acoustic influence). While early versions were based on the standard 1000kg SD Bomb case others were specially designed and manufactured with an aluminium body, making them extremely difficult to detect using magnetometers. The thin cased versions would normally disintegrate on impact on land and are normally considered to pose little threat to work on land based projects, but the risk increases significantly on projects over water or in marshland. Thicker cased versions however will survive impact and pose a significant risk regardless of the local ground conditions. (See Figure 5)

**FIGURE 5:** Common Airdropped Mines.

Parachute & Ground Mines



**NOTE:** all mine fuzes were designed to arm after deployment from the ship, submarine or aircraft, some fuze designs incorporated anti-removal booby traps. Unexploded mines found today are the result of a failure within the arming mechanism or procedure whereby the mine never fully armed. Sudden shock or jarring of a weapon in this state has the potential to complete the arming sequence and could result in the mine detonating with lethal consequences.

**Non-Steel Cased Bombs.** Used primarily in the construction of training or practice bombs, some high explosive variants were introduced towards the end of the war. With resources running scarce, German Engineers produced a small number of blast bombs with a concrete body. The design utilised a steel framework onto which concrete was cast. The explosive filling was also contained within a thin steel container within the bomb body. Very few “concrete” bombs were dropped on the UK. In common with standard steel cased weapons, this type of bomb can be detected using standard magnetometer detection techniques (albeit; providing a smaller ferromagnetic signature than its all steel counterparts). This type of bomb represents a very small percentage of the total number of bombs dropped worldwide and are not considered a significant threat, particularly when viewed from an overall bomb threat in the UK.

**Anti-Personnel Bomb.** Generally these were small weapons of 1-3 kilograms in weight and are often referred to as ‘Bomblets’ and possessing similar ground penetration ability as the Incendiary Bomblets. They were often located during the post-raid searches. This type of bomb has been recovered within the bomb rubble being cleared or used as in-fill on construction projects and poses the same potential to function as the Incendiary bomb with a greater potential to cause localised casualties.

**Specialist Bomb.** These types of bombs were designed to meet a specific mission requirement. Typically, this would be a design modification or special fusing to enable the bomb to destroy hardened/armoured targets or deep buried and sub-marine targets. Similar to the more common HE bombs, they differ in that they rarely contain large amounts of high explosive. Therefore the consequence of a detonation is reduced but remains a significant risk, particularly when the detonation occurs on or near the surface.

**Depth Bombs & Depth Charges.** These types of weapons were designed to meet a specific mission requirement. Typically, the modifications would include the type of explosive filling and special fusing to enable the bomb to penetrate to a significant depth into the ground or water before detonating. Depth bombs intended for maritime attack and sub-marine targets would be fitted with one or more fuzes, one of which would be a hydrostatic fuze designed to detonate the bomb at a predetermined depth. The bomb would be fitted with an anti skip ring to reduce the deflection of the bomb as it entered the water. Similar in many ways to Depth Bombs, Depth Charges were exclusively designed to detonate at a predetermined depth. This was achieved by fitting the Charge with a short time delay or hydrostatic fuze. Depth bombs; having a similar configuration to general purpose bombs had the potential to penetrate deeply into the sea bed where an attack occurred in the relatively shallower water of a dock.

**Unmanned Rocket Bombs & Missiles.** The most famous in this category of weapons were the V1 (Fi103 flying bomb) commonly known as the Doodlebug and the Larger V2 (A4 missile). Both V1 & V2 with high explosive warheads containing 850kg & 1000kg (respectively) represent some of the largest weapons to land in the United Kingdom. Both types were built in a similar manner to an aircraft and would generally disintegrate on impact even if the warhead failed to detonate. The impact would spread debris over a wide area which was difficult to miss and any resulting unexploded 'V' weapons were comprehensively dealt with at the time. For this reason they are rarely encountered on land. However, where a 'V' weapon landed in water the opportunity for the event to have been missed and/or follow-up action abandoned was greater and they continue to pose a significant risk. Other, less well known rocket bombs were also produced by the Luftwaffe to attack maritime targets. Some were equipped with TV/Radio guidance from the parent bomber. Two of the most common were the Fritz X which consisted of an adapted SD1400kg bomb and the Henschel Hs293 which was based on a smaller 500kg bomb. No record of one having been recovered on land as a UXB can be found but these large HE bombs are considered to pose a significant risk, particularly to maritime projects. No records were found to indicate this type of bomb was ever used on targets in the area.

**Photoflash Bomb.** This type of bomb was dropped by specialist "Pathfinder" aircraft and although this type of bomb can be included with the category of specialist bombs, it is worthy of specific comment due to the danger it may still pose. Photoflash bombs were designed to explode with a blinding flash, rather like a camera flashbulb. They were used to enable photographs to be taken of targets at night and also served to identify ground targets for other aircraft to attack. The speed at which the highly energetic filling detonated, and energy it produced in doing so, was significant. Although these bombs were thin skinned and are prone to corrosion the functioning of one can be compared to a high explosive bomb detonation.

**High Explosive Shells & Projectiles.** As mentioned previously, one of the most common sources of UXO contamination encountered in the United Kingdom is High Explosive Shells and Projectiles. This is most commonly found to be as the result of firing practice ranges, bombardment and anti-aircraft defence, the latter often positioned to defend Major cities and Strategic installations and ports from German Bombing. Anti Aircraft Shells and projectiles are generally smaller (Up to 4.7" inch diameter) than the airdropped bombs and as a consequence were more easily missed amongst the bomb rubble. However, coastal bombardment guns could fire a shell weighing 1000kg, (larger than most common airdropped bombs) and capable of significant ground penetration. The generic layout of a projectile can be found at Figure 6.6. It should be noted that the fatal incident on the German autobahn in 2006 was thought to be the result of a shell or projectile detonating, not an airdropped bomb as first reported.

The Fuzes used in Anti-Aircraft Ammunition were designed to ensure the projectile would detonate in contact with the target, or at a pre-set altitude, or in close proximity to the target. The fuzes employed different means to achieve this, including; direct impact, or indirect impact, Barometric, Delay and Electro-magnetic influence. Some were fitted with more than one fuze, which served to reduce the chance of the projectile falling to earth and detonating. Artillery fuzes are activated during the firing process, using the projectile's acceleration or spin within the gun barrel to switch off the safety mechanisms. For this reason fired projectiles are considered more dangerous than unfired ones.

**FIGURE 6: Generic Shell Design**

Generic High Explosive (HE) Shells (recent finds on site around the UK)



**Other Types of Ordnance.** The following additional sources of ordnance types have been considered, and inherent risks taken account of:

**Flares and Pyrotechnics.** Flares and pyrotechnics were used for a variety of reasons throughout the war and continue to be found today in the most unlikely places. However, due to the thin casings of these weapons a high level of corrosion is likely to have occurred since manufacture. Depending on the specific nature of the weapon, this effectively renders them inert with the exception of any white phosphorous content or explosive gain.

**Land Service Ammunition (LSA).** While as the name implies this type of ammunition was designed for use on land, it was also issued to naval personnel for close protection of vessels and their crew and to provide a limited offensive capability even to relatively small craft. This type of ammunition includes some shells and projectiles such as those covered previously. Other natures of LSA range from Small Arms Ammunition (SAA), having little or no high explosive content to Grenades, Mortars and Rockets which may pose a risk of detonation due to their explosive content and the design of their fuzes (impact) which; if subjected to sufficient shock or friction may result in the weapon functioning. (See Figure 7)

**FIGURE 7: Common Categories of Land Service Ammunition**

Land Service Ammunition

Small Arms Ammunition



Grenades



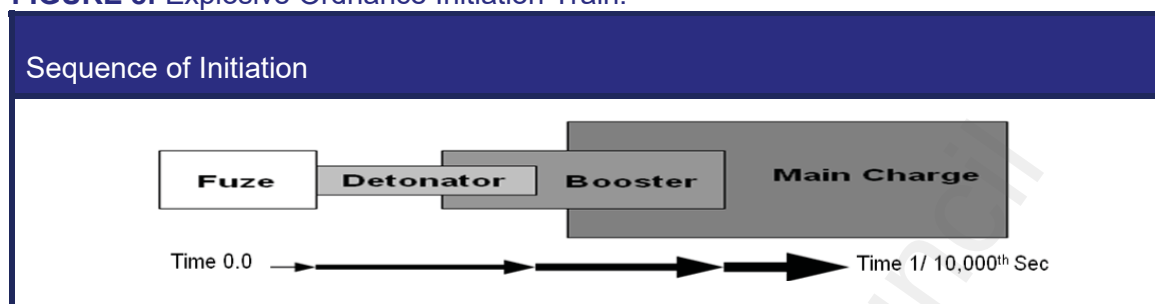
Mortar Bombs



**Initiation of Unexploded Ordnance.** Explosive Ordnance is highly unlikely to spontaneously explode. The energetic chemical compounds, (Explosives) used in weapon manufacture are chosen to be as stable as possible and they all require a significant application of additional energy to create the right conditions for detonation to

occur. If stored correctly, most explosive materials are designed to remain stable for the duration of their expected lifespan (typically 20 years). During this time, the correct functioning of the weapon is achieved by means of the 'Initiation Train' (See Figure 8).

**FIGURE 8: Explosive Ordnance Initiation Train.**



**Initiation Train.** This is a means by which, once the safety features have been switched off or removed, a chain reaction occurs through the weapon. Starting within the fusing system as a small ignition or spark, causing a detonator to explode, which in turn causes the booster charge to detonate with a greater energy and ending in the full detonation of the main explosive filling. Each part of the process has in-built safety features to prevent an unintended detonation. A failure in any of the components within the Initiation Train can result in a UXO. In the case of a UXB; the chain reaction has broken down and the Initiation Train is brought to a halt, albeit, a temporary one. There are a number of ways that sufficient energy could be introduced to the otherwise stable UXB / UXO that may allow the Initiation Train to set off once more, overcoming the initial reason for failure. In addition to subjecting the weapon to excessive heat, such as a fire, the most common methods to bring about an explosive detonation in such items are considered to be:

Direct impact onto the main body of the bomb by mechanical excavation or pile driving: Such an occurrence can cause the bomb to detonate, should the point of impact be on the bomb fuze; less force would be required to bring about a full or partial explosive detonation.

Re-starting the clock timer in the bomb fuze. Only a small percentage of bombs were fitted with clockwork fuzes. It is likely that corrosion has taken place within the fuze that may prevent the clockwork mechanism from functioning. However, the restarting of the clock is by no means a scenario that can be completely ruled out. This is considered to be one of the two most credible mechanisms by which sufficient energy could be introduced to the bomb and result in a detonation.

Induction of a static charge or exposure to an external power source (Electrical Services), causing a current in an electrical fuze. The majority of German bombs employed an electrical component within the fuzes, it is likely that corrosion would have taken place within the fuze mechanism and that it would no longer contain, or conduct sufficient electrical charge to initiate the bomb.

Friction initiating the sensitive fuze explosive. Some chemical constituents may have deteriorated, due to oxidisation. Components designed with a high degree of stability at the time of manufacture may no longer be as safe. **This is considered to be the most likely mechanism by which sufficient energy could be introduced to the bomb and result in a detonation.**



## Unexploded World War 2 bomb found on a Soho building site

LONDON | LONDON | SOHO | ⌚ Monday 3 February 2020, 3:33pm

Bomb disposal teams have removed an unexploded Second World War bomb from a busy area of central London.

Officers were called to a building site near Dean Street in Soho at 1.42pm after reports of the suspected explosive device.

Videos posted on Twitter showed people leaving buildings and gathering as police set up a cordon.

Witnesses described "lots of commotion" as the area surrounding the site was shut off. A Royal Engineers bomb disposal unit was called in and removed the half-tonne device. Shortly after 8.30pm, the Metropolitan Police's Soho team said the cordons in Oxford Street, Charing Cross Road, Shaftesbury Avenue, Lexington Street and Poland Street had been lifted.

A Ministry of Defence spokeswoman said: "An Army explosive ordnance disposal team has been called out to Soho to support the Metropolitan Police after discovery of a 500kg Second World War device.

"The Army EOD team have confirmed the bomb was safe to remove overnight to a location where it will be detonated," the spokesperson continued.

"Military personnel are regularly required to assist with the disposal of historic ordnance such as this, ensuring every situation is dealt with as quickly as possible for the safety of the general public."

<https://www.itv.com/news/london/2020-02-03/suspected-world-war-2-bomb-discovered-at-building-site-in-soho>



## Bomb disposal teams called to Luton after 'cannonball' found on a building site

ANGLIA | BOMB | CANNONBALL | POLICE

🕒 Friday 13 March 2020, 12:00pm



Bomb disposal teams and police cordoned off an area in Luton today (Friday 13) after what is thought to have been a cannonball was found on a building site. Hitchin Road was closed between Stopsley Way and Stockingstone Road.

Police were called at around 10.30am after someone reported seeing something suspicious on a nearby construction site.

Bedfordshire police say the explosive ordnance disposal team were called as a precaution. The roads have since reopened.

<https://www.itv.com/news/anglia/2020-03-13/bomb-disposal-teams-called-to-luton-after-cannonball-found-on-a-building-site>



## World War 2 bomb 'found yards away from West Ham's London Stadium' ahead of Arsenal clash

The Hammers' clash with Arsenal on December 9 could now be postponed although their match with Tottenham next Saturday will go ahead as planned.



Police cordoned off an area after an object believed to be a bomb was found near the stadium (Image: PA)

A bomb that dates back to World War Two has reportedly been found just yards away from West Ham's London Stadium. Ongoing work on an apartment development nearby had to be halted after the bomb was discovered on Friday morning.

Police officers set up a 150 metre cordon around the site after they were called to the scene just before midday, reports the Sun.

The area has been declared safe by experts for the time being, with a specialist mining team set to attend the site on November 25.

West Ham's match with Arsenal scheduled for December 9 is now under threat of postponement if there is any change in the safety status of the site.

Due to the timeframe of the visit from specialists, the Hammers clash with Tottenham next Saturday November 23 is due to go ahead as planned.

"It's crazy to think of all the people walking around here during the Olympics and we had no idea it was here.

"The bomb is in a tricky position, so could take up to two weeks to sort it out, which takes us into the second week of December.

"We will continue our efforts to safely establish what the object is but the park and its venues will continue to remain open." "Between now and 25 November teams will be putting together a plan of what to do." However, despite suggestions that the object is a bomb, a spokesman for the London Legacy Development Corporation (LLDC) who handle Olympic Park, were keen to stress the item is as yet unidentified.

# Andover Advertiser

02<sup>nd</sup> March 2019



Schools and homes have been evacuated after a Second World War bomb was discovered on a building site.

Army bomb disposal experts are on the scene after the unexploded device was found in Brent, north-west London.

Work on the site is expected to continue until at least Friday afternoon, Brent Council said. A police cordon has been established at the scene and will be extended to around 300m on Friday morning, forcing more residents to leave their homes.

More than 50 people are currently staying at a rest centre set up at St Martin's Church on Mortimer Road, Kensal Green.

Several British Red Cross volunteers are on hand to provide support to affected residents. Scotland Yard said it was called to The Avenue, near Brondesbury Park, at around 11.30am on Thursday following the discovery.

Nearby schools, businesses and residents were evacuated, and roads closed.

# MailOnline

5th February 2019

Railway station is evacuated and trains ordered not to stop when builders find unexploded World War Two bomb;

- Rochester Station was closed for over two hours after the bomb was found
- The military and British Transport Police were called in to deal with the threat
- While they worked trains were allowed to run fast through the station
- Builders at a nearby construction site found the shell in the mud at around 1pm

A railway station was evacuated this afternoon after a WWII bomb was discovered by builders working in Rochester, Kent.

British Transport Police and military personnel descended on the train station following the construction workers finding the unexploded shell underground.

The station was evacuated at 1.25pm and trains could run fast through the station while they worked to remove the hazard.



By 3pm - and in time for rush hour - the bomb had been safely removed by the bomb squad and Rochester Station could resume normal service.

South Eastern Tweeted: 'Builders working next to Rochester station reported that they may have found a Second World War unexploded bomb.

'@Se\_Railway (Southeastern) and @TLRailUK (Thameslink) trains are running fast through the station without stopping while we await the arrival of military help. Please check before you travel!'

The WWII bomb was discovered on a building site off the station's land, but close enough that trains were unable to stop as a safety precaution.

Later on Network Rail updated passengers and wrote: 'The bomb has been removed and normal service has resumed. Thank you for your patience.'

## Risk Assessment Tables

**Table 1:** Summary of Potential Contamination Sources

| Source                                     | Applicable                          | Not Applicable                      |
|--------------------------------------------|-------------------------------------|-------------------------------------|
| <b>Enemy Attack &amp; Counter Measures</b> |                                     |                                     |
| Bombing WW1                                |                                     | <input checked="" type="checkbox"/> |
| Manned Aircraft Bombing WW2 (Potentially)  | <input checked="" type="checkbox"/> |                                     |
| Unmanned V1 & V2 Rocket Attack             |                                     | <input checked="" type="checkbox"/> |
| Shelling                                   |                                     | <input checked="" type="checkbox"/> |
| Anti-Shipping Mines & Depth Charges        |                                     | <input checked="" type="checkbox"/> |
| Anti-Aircraft Shells & Rockets             |                                     | <input checked="" type="checkbox"/> |
| Beach Mines & Coastal Defences.            |                                     | <input checked="" type="checkbox"/> |
| Airfield/Key Point Defensive Mines/Charges |                                     | <input checked="" type="checkbox"/> |
| Abandoned Unexploded Bomb (A/UXB)          |                                     | <input checked="" type="checkbox"/> |
| <b>Migration of UXO</b>                    |                                     |                                     |
| UXO Migration in Rubble & Infill           |                                     | <input checked="" type="checkbox"/> |
| UXO Migration by Tide & River Current      |                                     | <input checked="" type="checkbox"/> |
| UXO Migration by Marine Dredging           |                                     | <input checked="" type="checkbox"/> |
| Shipwrecks                                 |                                     | <input checked="" type="checkbox"/> |
| Dispersal by Explosion, Fire & Accident    |                                     | <input checked="" type="checkbox"/> |
| Aeroplane Crash                            |                                     | <input checked="" type="checkbox"/> |
| Private Collections                        |                                     | <input checked="" type="checkbox"/> |
| <b>MOD Facilities</b>                      |                                     |                                     |
| Bombing Range                              |                                     | <input checked="" type="checkbox"/> |
| Artillery, Mortar & Tank Range             |                                     | <input checked="" type="checkbox"/> |
| Grenade Range                              |                                     | <input checked="" type="checkbox"/> |
| Small Arms Firing Range                    |                                     | <input checked="" type="checkbox"/> |
| Weapon Research & Development Facilities   |                                     | <input checked="" type="checkbox"/> |
| Ammunition Burial Grounds                  |                                     | <input checked="" type="checkbox"/> |
| Docks & Harbour Facilities                 |                                     | <input checked="" type="checkbox"/> |
| Offshore Ammunition Dumping Grounds        |                                     | <input checked="" type="checkbox"/> |
| Ammunition Storage & Manufacture Sites     |                                     | <input checked="" type="checkbox"/> |
| Airfields & Air Stations                   |                                     | <input checked="" type="checkbox"/> |
| Bombing Decoy Site                         |                                     | <input checked="" type="checkbox"/> |
| Army Barracks & Camps                      |                                     | <input checked="" type="checkbox"/> |
| MOD Training / Concentration Areas         |                                     | <input checked="" type="checkbox"/> |
| Home Guard & SOE Weapon Caches             |                                     | <input checked="" type="checkbox"/> |

**Table 2: Airdropped Weapon Strike Indicators (UK)**

| Item                                                                                                                                                    | Increasing Potential level →    |                       |                              |                  |
|---------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|-----------------------|------------------------------|------------------|
| Site Location                                                                                                                                           | Rural                           | Small Town            | Brown Field<br>Large Towns   | Cities           |
| Site Description and Use                                                                                                                                | Greenfield or Agricultural Land | Near Strategic Target | Adjacent to Strategic Target | Strategic Target |
| Site History                                                                                                                                            | No history of Attack            | Near area of Attack   | Immediate Area Attacked      | Direct Attack    |
| Strategic Target: Military Installation, Industrial or Munitions Manufacturer, Power Station, Gas or Water Works, Port, Dock, Railway Yard, Decoy Site. |                                 |                       |                              |                  |

**Table 3: Weapon Strike Records (UK)**

| Source    | Availability |              |          |           |
|-----------|--------------|--------------|----------|-----------|
| Archive   | None         | Non-specific | Specific | Extensive |
| In-house  | None         | Non-specific | Specific | Extensive |
| Anecdotal | None         | Non-specific | Specific | Confirmed |

**Table 4: Anti-Aircraft Weapon Strike Indicators (UK)**

| Item                                                                        | Increasing Potential level → |              |        |               |
|-----------------------------------------------------------------------------|------------------------------|--------------|--------|---------------|
| Site Location                                                               | Rural                        | Town         | City   | Military Site |
| Fixed Battery Location                                                      | None                         | General Area | Nearby | Onsite        |
| Mobile Battery                                                              | Rural                        | Town         | City   | Military Site |
| Military Site: Airfield, Port, Radar, Barracks, Depots, Arsenal or Similar. |                              |              |        |               |

**Table 5: Abandoned Bomb Records (UK)**

| Item     | Increasing Potential level → |     |         |
|----------|------------------------------|-----|---------|
| In-house | None                         | Yes | On-site |
| Other    | None                         | Yes | On-site |

**Table 6:** Opportunity to have detected Bomb or Shell Strikes (UK)

| Increasing Potential level ⇒                                                                |  |
|---------------------------------------------------------------------------------------------|--|
| No bombs recorded                                                                           |  |
| Good ARP cover                                                                              |  |
| Significant development                                                                     |  |
| No significant ground cover                                                                 |  |
| Bomb recorded within close proximity to Site boundary                                       |  |
| Moderate ARP cover                                                                          |  |
| Moderate development (across some areas of the site)                                        |  |
| Frequent public access                                                                      |  |
| Little ground cover                                                                         |  |
| Bombs recorded within Site boundary                                                         |  |
| <b>Poor ARP cover</b>                                                                       |  |
| Minimal development limited to shallow excavations (within some areas of the site location) |  |
| Infrequent public access                                                                    |  |
| <b>Moderate ground cover</b>                                                                |  |
| Heavy bomb damage/total destruction                                                         |  |
| No ARP cover                                                                                |  |
| Development limited to site clearance                                                       |  |
| Controlled private access                                                                   |  |
| Heavy ground cover, vegetation, ploughing or body of water                                  |  |

**Table 7:** Post Contamination Development Indicators (UK)

| Nature of Post Contamination Development | Highlighted                                                       |
|------------------------------------------|-------------------------------------------------------------------|
|                                          | 100% excavations of the entire site to below contamination depth. |
|                                          | Significant development (across some areas of the site, post WW2) |
|                                          | Moderate development (across some areas of the site)              |
|                                          | <b>Minimal development (across some areas of the site)</b>        |
|                                          | <b>No development</b>                                             |

**Table 9:** Construction Activities Encounter Indicators

| Activities | Highlighted                                                 |
|------------|-------------------------------------------------------------|
|            | Borehole Drilling                                           |
|            | Dynamic Sampling                                            |
|            | Shallow Trial Pit (within made ground)                      |
|            | Services Trenching (within made ground)                     |
|            | Bored (CFA) Piling                                          |
|            | Sheet Piling                                                |
|            | Shallow Excavations over extended area (within made ground) |
|            | Deep Excavations over a limited area                        |
|            | High Density Piles                                          |
|            | Deep Excavations over extended area                         |
|            | Bulk Excavations                                            |

**NOTE:** The **MEDIUM** risk is only relevant for areas previously designated a **MEDIUM** risk. See Risk Map.

| Risk Category Key | Mitigation Requirement                                                                                                                |
|-------------------|---------------------------------------------------------------------------------------------------------------------------------------|
| <b>Green</b>      | No/Minimum Mitigation measures required (see document recommendations)                                                                |
| <b>Amber</b>      | Medium risk of encountering items of UXO (or items there off) within the site boundary, mitigation required for safe systems of work. |
| <b>Red</b>        | High risk of finding items of UXO (or items there off) within the site boundary, mitigation required for safe systems of work.        |