BROWNFIELD SOLUTIONS LTD

GEO-ENVIRONMENTAL ENGINEERING EXCELLENCE

REDEFINE HOTELS READING LTD

Redefine Hotel/Reading

Desk Study Assessment Report

TM/C3932/7633

June 2018

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PROJECT QUALITY CONTROL DATA SHEET

Site Name:	Redefine Hotel, Reading		
Report Title:	Desk Study Assessment Report		
Report No:	TM/C3932/7633		
Status:			
Date:	12 June 2018		
Revision:			

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DESK STUDY ASSESSMENT REPORT
FOR A SITE OFF RICHFIELD AVENUE, READING

1.0 INTRODUCTION

1.1 Objectives

1.1.1 This report describes a Desk Study Assessment carried out by Brownfield Solutions Limited (BSL) for Redefine Hotels Reading Ltd for a site off Richfield Avenue, Reading.

1.1.2 The objectives of the Desk Study Assessment were to determine the site's environmental setting and likely ground conditions, highlighting potential areas of concern that may govern the site's redevelopment.

1.1.3 The report has been completed to fulfil the requirements of a preliminary risk assessment in accordance with CLR11 "Model Procedures for the Management of Land Contamination" and BS 10175:2011+A2:2017 "Investigation of potentially contaminated sites".

1.2 Proposed Development

1.2.1 The proposed development is commercial end use, comprising a 132-bed hotel with ancillary facilities, together with associated car parking and soft landscaping areas.

1.3 Limitations

1.3.1 This Desk Study Assessment has been carried out based on information obtained from a number of areas, BSL have assumed that this information is correct.

1.3.2 There may be other conditions prevailing on the site which are outside the scope of work and have not been highlighted by this assessment and therefore not been taken into account by this report. Responsibility cannot be accepted for such site conditions not revealed by the assessment.

1.3.3 This report has been prepared for the sole use of the client. No other third parties may rely upon or reproduce the contents of this report without the written permission of Brownfield Solutions Ltd (BSL). If any unauthorised third party comes into possession of this report they rely on it at their own risk and BSL do not owe them any Duty of Care.

2.0 THE SITE

2.1 Location & Access

2.1.1 The site covers an area of approximately 0.58 hectares and is situated circa 1.25 kilometres north-west of Reading town centre, immediately south of the River Thames.

2.1.2 The site is centred on National Grid Reference 470980, 174536 as shown on the Site Location Plan, which can be found in drawing C3932/01.

2.1.3 Access to the site is gained off Thames Side Promenade to the east of the site.

2.2 Site Description

2.2.1 BSL conducted a site visit on 4th June 2018, on which the following site description is based.

2.2.2 The site is currently being used as car parking which is almost entirely covered in asphalt hard standing, except for three banks of vegetation (trees and grass) separating the car parking bays running east-west through the site and the south east corner covering with soft landscaping comprising mown grass. The asphalt is mostly in good condition, although two areas of minor scarring were noted in the eastern part of the site.

2.2.3 The site boundary is fenced off by metal fencing with a coded electronic gate for access. The site also includes an open area of soft landscaping in the south east corner of the site.

2.2.4 The site is generally flat, however the southern boundary on site is an embankment due to the adjacent stream.

2.2.5 Within the carpark there are two containers which are fenced off in the north-east corner of the site which appeared to be a storage area contain rubbish, recycling and bricks. There is a metal cabinet within this area with a label stating, 'containing flammable liquid'. No evidence of spillage or leakage was observed.

2.2.6 A drain was noted running along the southern boundary of the site flowing in a south-east direction. The drain was noted to be approximately 2m below surface level. The drain disappears from views near the south-eastern corner of the site. The side walls of the stream in the south east corner are brick lined.

3.0 ENVIRONMENTAL SETTING

3.1 Geological Search

3.1.1 The following publications of the British Geological Survey (BGS) were examined in respect of the geology underlying the site:

- 1:50,000 Scale Geological Sheet 268, Reading. Solid/drift

Artificial Ground

3.1.2 BGS maps do not show any areas of artificial ground beneath the site. However, given the site has previously been developed, made ground is anticipated to be present.

Superficial Deposits

3.1.3 The site is indicated to be underlain by the Langley Silt Member, which typically comprises clayey and sandy silt. Alluvium is shown outcropping approximately 20m north-east of the site and may be present locally beneath the site. This typically comprises variable sandy, silty, gravelly clay, locally shelly with peat and tufa layers.

Solid Geology

3.1.4 The solid geology beneath the site is indicated to be the Seaford Chalk Formation and Newhaven Chalk Formation (undifferentiated) which typically consists of soft, white, nodular chalk with flint seams.

3.1.5 No faults are shown on or within an influencing distance of the site.

3.2 Hydrogeology

3.2.1 The superficial Langley Silt Member, which directly underlies the site, is classified by the Environment Agency as Unproductive Strata (rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow).

3.2.2 The superficial alluvial deposits, which outcrop approximately 20m north-east of the site, are classified by the Environment Agency as a Secondary A Aquifer (permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers).

3.2.3 The bedrock is classified as a Principal Aquifer (geology of high intergranular and/or fracture permeability, usually providing a high level of water storage and may support water supply/river base flow on a strategic scale). The major aquifer beneath the site is classified as having a high leaching potential (soils which readily transmit liquid discharges because they are shallow or susceptible to rapid flow directly to rock, gravel or groundwater.

3.2.4 There are four groundwater abstraction licences within 500m of the site, all of which are located 402m south of the site, for potable water and industrial use.

3.2.5 The site is not located within 500m of any source protection zones.

3.3 Hydrology

3.3.1 The nearest named watercourse is the River Thames, which lies at a distance of 87m north-east of the site. The nearest watercourse is an unnamed inland river located 6m south of the site. Evidence from historical mapping suggests this watercourse is a drain.

3.3.2 Chemical quality data is available for the River Thames, which was graded as A (very good) between 2005 and 2009, which is the most recent record. There is no biological quality data available for rivers within 1500m of the site.

3.3.3 There are three historical surface water abstraction licenses within 500m of the site which expired in 2016, all of which were located 422m east of the site in the River Thames. The closest active surface water abstraction license is located approximately 1100m east of the site in the River Thames.

3.3.4 There are four licensed discharge consents located within 500m of the site, the closest of which is held by Calendars Restaurant, located 44m south-west of the site, discharging surface water.

3.3.5 There are a further four records of list 1 dangerous substances inventory sites, 436m west of the site, which discharge dangerous substances, including mercury and cadmium. The receiving water for these substances is the River Kennet which joins the River Thames as a tributary, downstream of the site.

3.3.5 Information obtained from the Environment Agency indicates that the majority of the site is located on a Zone 2 floodplain. The far north-eastern corner of the site, nearest to the River Thames, straddles the edge of a zone 3 floodplain. The Environment Agency Risk of Flooding from Rivers and the Sea (RoFRaS) for the site is low.

3.4 Historical Setting

3.4.1 Information has been obtained from historical Ordnance Survey Maps with the pertinent issues that may have affected the site or its environs summarised below.

3.4.2 The following plans produced by the Ordnance Survey were examined.

Scale	Date
1:1250	1957, 1959, 1971, 1976, 1982, 1984, 1988, 1993
1:2500	1877, 1881, 1899, 1913, 1932, 1936, 1956, 1959
1:10000/10560	1878, 1900, 1913, 1914, 1933, 1938, 1962, 1973, 1979, 1991, 1994, 2002, 2010, 2014

<u>The Site</u>

3.4.3 The earliest map dated 1877 indicates the site to be undeveloped.

3.4.4 By 1910, there is a cart track running south-east to north-west through the south-east corner of the site, extending two-thirds of the way across the subject area.

3.4.5 The site remains unchanged until 1979, when a **car park** was built across the majority of the site, which still covers the site in the present day.

Surrounding Area

3.4.6 The earliest map available of 1877 shows the site to be surrounded by mostly agricultural land, with the River Thames flowing from north-west to south-east, located approximately 40m north-east of the site. The mapping shows significant areas of marsh in the river, containing vegetation such as osiers. The **Steam Saw Mills** and a **timber yard** are located approximately 175m south-east of the site. There is a **smithy** and **coal yard** located 250m north-east.

3.4.7 By 1899 mapping, the coal yard, Steam Saw Mill and timber yard are no longer marked. There are numerous **boat houses** located approximately 25m north-east of the site.

3.4.8 By 1913, there is a public urinal located 100m east of the site, a **foundry** located approximately 175m east of the site and a new **timber yard** 250m south-east of the site. There is a paddling pool located approximately 200m north-west of the site. The smithy is no longer annotated.

3.4.9 By 1932, there is a drinking water fountain located 15m north-east of the site.

3.4.10 By 1936 mapping, an allotment site is shown approximately 150m south of the site and is no longer shown by 1956 mapping.

3.4.11 By 1956, there is another **boat house** located approximately 15m east of the site. A large boat house, located adjacent to the foundry, is shown approximately 125m east of the site. The foundry is now annotated as an **engineering works and foundry**. The timber works located approximately 250m south-east is no longer marked, and a **metal works** is annotated in neighbouring buildings. There is an open water conduit marked as a 'drain' running outside the southern edge of the site. A new works building is located approximately 150m south of the site which is annotated as a **joinery works** by 1970 mapping.

3.4.12 By 1970 mapping, there is a car park located immediately north-east of the site and a garage located approximately 200m north-east of the site. The large boat house located adjacent to the foundry, 125m east of the site, is now part of the foundry and engineering works complex. There is another engineering works approximately 200m east of the site. A new industrial estate has been built between 125m and 275m south-west of the site, comprising **warehouses**, a newsagent **depot**, **engineering works** and associated **tank**, **chimney** and **electricity substation**. An **electricity substation** is shown 100m south-east of the site.

3.4.13 By 1979 mapping, there is a new **depot** shown approximately 100m south of the site but this is no longer annotated by 1989.

3.4.14 By 1982 mapping, there is a public toilet located immediately east of the site.

3.4.15 By 1988 the paddling pool located 200m north-west of the site has been partially **infilled**. The **car park** located immediately north-east of the site has been extended

along the northern site boundary.

3.4.16 By 1989, the **foundry,** its associated **engineering works** and the **metal works** located 125m east of the site have been demolished. A new leisure centre has been built approximately 300m west of the site.

3.4.17 By 1993, the **boat houses** located approximately 25m north-east of the site no longer exist and have been replaced by a hotel. The **electricity substation** in the industrial estate approximately 200m south-west of the site is no longer annotated.

3.4.18 No significant changes are recorded on the historical maps to the present day.

3.4.19 The Historical Maps are presented in Appendix A.

3.5 Environmental Searches

3.5.1 An Environmental Search has been conducted through Groundsure, which utilises British Geological Survey and Environment Agency databases. The full report can be found in Appendix B, although a summary of the more relevant findings is presented below.

Entry	0 – 249m	250 – 500m	Details
Authorised industrial processes (IPC/IPPC/LAPPC)	0	0	There are no IPC/IPPC/LAPPC permits, but there is a permit for the unloading of petrol into storage at the Snax 24 service station, 62m south-east of the site.
Pollution Incidents	4	4	The earliest and closest was in July 2001 and occurred on-site, relating to pollution from organic chemicals/ products and had 'no impact' to water, land or air. The next closest occurred 3m south of the site in August 2002 and related to pollution by oils and fuel, which had a minor impact on water and land. The only other notable incidents, which had a minor impact to land, occurred in February 2002, 224m and 297m west of the site. All other incidents had no impact to water, air or land.
Landfill and Waste treatment	2	0	There is one record of a landfill site located on-site and up to 700m west of the site, which accepted commercial, household and liquid sludge waste between 1970 and 1979. The other record relates to a scrap metal yard located 163m south of the site. Historical maps suggest the scrap yard was active from 1967 and ceased operations between 1979 and 1989.

Entry	0 – 249m	250 – 500m	Details
Discharge consent	3	1	The closest discharge consent is located 44m south-west for Calendars Restaurant, effective since 1988. The other discharge consents within 250m were located 200m and 205m east of the site but were revoked in 1995 and 1991, respectively. The other discharge consent is located 336m west of the site, for Riverside Leisure Centre. The receiving water for both active consents is the Portman Brook.
Control of Major Accident Hazard (COMAH) sites	0	0	
Consents issued under planning (Hazardous substances) Act 1990	0	0	
Radioactive substances	0	0	
Fuel Station entries	1	3	The closest entry is an active BP station located 49m south-east of the site. The next nearest is an active Esso located 340m north-east. The other entries are noted to be obsolete.
Other current industrial land uses	19	N/A	The closest entry relates to the Snax 24 fuel station, 55m south-east of the site. Five of the entries relate to moorings and unloading facilities along the River Thames. There are various vehicle repair/hire/sales outlets within 250m of the site. There are two electricity substations, located 78m south-west and 100m south-east of the site, and a generic tank located 202m south-west of the subject area.

3.6 Radon

3.6.1 Map 3 Dorset, Somerset, Wiltshire and Bristol Channel was inspected which defines areas which require radon protective measures. Reading is not an area requiring Radon precautions in foundations in accordance with BRE Report 211 'Radon – Guidance on protective measures for new dwellings' 2007 Edition.

3.6.2 The subject area is not in a radon affected area, as less than 1% of homes are above the action level.

3.6.3 BRE Report 211 provides a general indication of which areas require radon protection, a site-specific assessment can be carried out through UK Radon or BGS.

3.7 Coal Authority Search

3.7.1 The site is outside the area of a designated coalfield, the Law Society and Coal Authority state a mining search is not required.

Additional Mineral Workings/Extractions

3.7.2 There are no known mining areas within 50m of the site boundary.

3.8 BGS Boreholes

3.8.1 There are twelve borehole records within 100m of the site.

3.8.2 These indicate that there is between 1.50m and 3.00m of made ground, which typically consists of soft to firm sandy silty clay containing brick fragments, gravel, cobbles and building rubble. One trial pit record indicated an organic ash fill within the made ground.

3.8.3 This is underlain by between 4.40m and 7.15m of variable silty, clayey sand and gravel. This is underlain by between 4.40m and 5.40m of 'hard rubbly chalk with a matrix of soft weathered chalk and some flints'.

3.8.4 The bedrock is typically encountered between 13.00mbgl and 13.50mbgl and consists of hard chalk with flints.

3.8.5 One borehole record from 1972, located approximately 600m north west of the site, but within the alleged landfill boundary, did not record any evidence of landfill deposits.

3.8.6 The BGS Borehole Logs are presented in Appendix C.

3.9 UXO Risk

3.9.1 In accordance with CIRIA Report C681, BSL have reviewed non-specialist UXO data for the site using the Zetica Regional Bomb Risk Map (Manchester). The map indicates the site to be in an area where the bomb risk is low.

3.9.2 There is no indication of former military use of the site from the desk study.

3.9.3 As the site is low bomb risk, no further consideration of UXO is required.

3.9.4 A copy of the map is presented in Appendix G.

4.0 DESK STUDY SUMMARY AND RISK ASSESSMENT

4.1 Introduction

4.1.1 The risk posed by any contaminants in soil or groundwater will depend on the nature and level of the source, the probability of exposure occurring, the potential pollution pathway and the likely effects on the receptors.

4.1.2 A contaminant is defined as a substance that has the potential to cause harm, a risk is considered to exist if such a substance is present at sufficient concentrations to cause harm and if a pathway is present a receptor could be exposed to the contaminant.

4.1.3 The following sections discuss the identified potential on-site and off-site sources, and any pollution that could impact receptors associated with the proposed development. Pollution linkages are assessed which may represent a risk to human health and/or controlled water receptors from the information gained from the desk study searches. The assessment has been carried out on a qualitative basis and aims to produce a complete and comprehensive Preliminary Conceptual Site Model.

4.1.4 Three potential impacts exist for any given site and all three need to be considered in the qualitative risk assessment, these are:

- On- site impacts;
- The site impacting its surroundings;
- Off-site sources impacting the subject site.

4.2 Potential Contaminative Sources

<u>On-Site</u>

4.2.1 From the information obtained during the desk study, potentially contaminative sources do exist which may affect the redevelopment of the site for commercial end use. These include:

- There is a historic landfill site indicated to be present beneath the site;
- The made ground which is anticipated to be present beneath the site as a result of previous development of the site, including an area of potentially infilled ground resulting from the former cart track running through the site;
- The storage of vehicles during the current and former usage of the site as a car parking area also represents a potentially contaminative source.

<u>Off-Site</u>

4.2.2 From the information obtained during the desk study, several land uses have been identified which may affect the development of the site for commercial end use. These include:

- Numerous boat houses (the closest of which was located 15m east of the site;
- A car park (located immediately north and north-east of the site);
- An electricity substation (100m south-east of the site);

- The Steam Saw Mill and timber yards (located between 175m and 250m south-east of the subject area);
- A foundry and engineering works (175m east of the site);
- A coal yard (250m north-east);
- A smithy (250m north-east);
- A metal works (250m south-east);
- A business park comprising warehouses, depots, engineering works with associated tank, chimney and electricity substation (circa 125m and 275m south-west of the site);
- Former scrap yard.

Associated Contaminants

4.2.3 The contaminants commonly associated with the potential sources of contamination identified include:

- Landfill site – hazardous ground gases, heavy metals, solvents, leachates, mineral acids, hydrocarbons;
- Made ground – asbestos containing materials (ACMs), metals, poly-cyclic aromatic hydrocarbons (PAHs), ground gases;
- Car parking, boat houses, warehouses & depots – fuels, oils;
- Electricity substations – polychlorinated biphenyls (PCBs);
- Iron foundry – metal dust, silica dust, mineral acids, asbestos;
- Metal works – heavy metals, alkalis, volatile organic compounds (VOCs), oils;
- Scrap yard – hydrocarbons, asbestos, metals.

4.3 Pathways

4.3.1 A pathway is defined as a medium by which a contaminant comes into contact with, or otherwise impacts a receptor. Due to the site's proposed end use being commercial, potential pollution pathways for contaminant migration at the site will exist.

4.3.2 At this stage the potential contaminants identified above are considered to present potential risks to site end users and controlled waters through the following pathways:

- Ingestion of contaminated soils;
- Dermal contact with contamination;
- Inhalation of gases or vapours in both indoor and outdoor air;
- Direct contact by buried structures such as services pipes;
- Surface run-off;
- Leaching of mobile contamination into groundwater;
- Migration of perched groundwater in any permeable soils or along existing or proposed service runs;
- Saturated zone flow through the Principal Aquifer underlying the site;

4.4 Receptors

4.4.1 Receptors generally fall into the categories of human health or controlled waters. The identified receptors are listed below:

- Construction workers;
- Site end users;
- River Thames;
- Secondary A Aquifer in the superficial deposits;
- Principal Aquifer in the bedrock;

4.4.2 Contaminants within the soil and groundwater could potentially attack the clean potable water supply pipe, the contaminants should be assessed to determine the correct pipe material and level of precautions.

4.5 Preliminary Conceptual Site Model

4.5.1 The information obtained in the previous sections has been used to compile a Preliminary CSM. The identified potential contaminants and receptors have been assessed in the table below as to whether a plausible source-pathway-receptor pollutant linkage for the proposed end use of the site exists. The risk classification has been estimated in accordance with information in Appendix E.

Human Health

4.5.2 The Preliminary CSM for human health is presented in the table below:

Potential Source	Potential Pathway	Potential Receptor	Likelihood	Severity	Level of Risk
ON-SITE					
Historic Landfill Heavy metals, solvents, leachates, mineral acids, hydrocarbons	Ingestion, direct contact, inhalation of dusts.	End-users & construction workers	Likely	Medium	Moderate
Historic Landfill Hazardous ground gases	Migration into confined spaces / explosion / inhalation and asphyxiation	End-users / property	Likely	Severe	High
Made Ground ACMs, metals, PAHs	Ingestion, direct contact, inhalation of dusts.	End-users & construction workers	Likely	Medium	Moderate
Made Ground (Asphalt) Ground gases	Migration into confined spaces / explosion / inhalation and asphyxiation	End-users / property	Low Likelihood	Severe	Moderate
Car Park Fuels, oils	Ingestion, direct contact, inhalation of dusts.	End-users & construction workers	Low likelihood	Mild	Low
OFF-SITE					
Car Park Fuels, oils	Ingestion, direct contact, inhalation of vapours	End-users & construction workers	Low likelihood	Mild	Low
Boat Houses Fuels, oils	Ingestion, direct contact, inhalation of vapours	End-users & construction workers	Low likelihood	Mild	Low

Potential Source	Potential Pathway	Potential Receptor	Likelihood	Severity	Level of Risk
Electricity Substation PCBs	Ingestion, direct contact, inhalation of vapours	End-users & construction workers	Low likelihood	Medium	Moderate/Low
Warehouses, depots, engineering works, metal works, etc. Metals, acids, alkalis, VOCs, oils	Ingestion, direct contact, inhalation of vapours	End-users & construction workers	Low likelihood	Medium	Moderate/Low

Human Health Justification

4.5.3 The former landfill site located directly beneath the subject area is recorded to have accepted household and commercial waste and liquid sludge. It is considered likely that a diverse range of contaminants is present beneath the site, furthermore details of capping is unknown. The severity of this contamination is assessed as medium until further details can be obtained about the nature of these contaminants. The overall level of risk is assessed as moderate.

4.5.4 Significant ground gases are likely to be generated at the site as a result of decaying waste associated with the former landfill site. Given the site has been covered by impermeable hard standing since the landfill closed, it is likely that gases may have built up beneath the site. Post the 1956 clean air act, putrescible wastes were sent to landfill. Therefore, the overall level of risk from ground gases associated with the landfill site is assessed as high.

4.5.5 Due to the current and former development within the subject area, made ground is considered likely to exist beneath the site. The overall risk to human health is considered moderate due to the severity of the risk posed by typical contaminants associated with made ground.

4.5.6 The site has been used as a car park since 1979, during which time contamination of soils by hydrocarbons may have occurred. However, the likelihood is low as much of the fuel and oils from the car park will dissipate away from the site by surface run-off over hard-standing and any spillages are likely to be localised and small. Any contaminants are therefore likely to be present in low concentrations and are unlikely to pose a chronic risk to human health. The overall risk to human health from the site's current use is therefore considered to be low.

4.5.7 Similarly, hydrocarbon contamination resulting from the nearby boat houses is considered to pose a low risk to human health, due to the localised nature of spillages and likelihood of drainage away from the site into the River Thames.

4.5.8 PCBs are relatively immobile, so there is a low likelihood of them impacting the site, given that the nearest electricity substation is approximately 100m away. Similarly, many of the industrial activities are historic and in excess of 100m away from the

site, so there is a low likelihood of these activities impacting human health within the subject area.

Controlled Waters

4.5.9 The Preliminary CSM for controlled waters is presented in the table below:

Potential Source	Potential Pathway	Potential Receptor	Likelihood	Severity	Level of Risk
Historic Landfill	Migration through groundwater or granular soils	Secondary A Aquifer / River Thames	Likely	Medium	Moderate
Historic Landfill	Migration through groundwater or granular soils	Principal Aquifer	Low likelihood	Medium	Moderate/Low
Made Ground	Migration through groundwater or granular soils	Secondary A Aquifer / River Thames	Likely	Medium	Moderate
Made Ground	Migration through groundwater or granular soils	Principal Aquifer	Low likelihood	Medium	Moderate/Low
Car park	Surface run-off	Secondary A Aquifer / River Thames	Likely	Medium	Moderate

Controlled Waters Justification

4.5.10 The depth of material deposited into the historic landfill is unknown. The most recent BGS map shows the Langley Silt Member, comprising clayey and sandy silt, outcropping directly beneath the site, suggesting any landfill deposits are likely to be shallow reducing its potential impact.

4.5.11 The presence of silts beneath the site is likely to restrict downwards migration of contaminants which may exist within the made ground and landfill deposits in the shallow subsurface, resulting in a moderate/low level of risk from near-surface contaminants to the Principal Aquifer.

4.5.12 Groundwater within the made ground and landfill deposits is therefore likely to be forced to migrate laterally which, given the probable gradient of groundwater flow towards the River Thames, is expected to migrate either directly into the River or into the Secondary A Aquifer in the alluvial deposits located 20m north of the site. The overall risk of potentially contaminated groundwater present in the made ground migrating to the River Thames and Secondary A Aquifer is therefore moderate.

4.5.13 The assumption that the landfill on site is shallow and underlain by a relatively impermeable barrier of clayey and sandy silts should be confirmed by intrusive site investigations.

4.5.14 The quality of hardstanding present both across the site and between the site and the River Thames means it is likely that surface run off containing hydrocarbons from the site may enter the river.

4.6 Ground Gas Risk Assessment

4.6.1 A potential on-site gas source has been identified and the preliminary CSM considers it to be a high risk to site end users.

4.6.2 In accordance with CIRIA C665 as set out in Appendix F of this report, the gas generation penitential is high. Therefore the recommended gas monitoring should comprise 12 visits over a 6-month period. This should be reassessed following the intrusive investigation results.

5.0 DEVELOPMENT CONSTRAINTS

5.1 Foundations

5.1.1 The proposed development is commercial end use comprising a 132-bed hotel with ancillary facilities, together with associated car parking and soft landscaping areas.

5.1.2 There is likely to be made ground beneath the site, as well as waste material associated with a possible former landfill beneath the site. The presence and thickness of the alleged landfill material is unknown.

5.1.3 The closest BGS borehole records indicate hard chalk bedrock is likely to be encountered between 13.00mbgl and 13.50mbgl.

5.1.4 There are currently numerous trees lining the south-western, north-western and north-eastern boundaries of the subject area, as well as two banks of trees running east-west within the site.

5.1.5 BGS GeoSure data indicates there is a moderate maximum compressible ground stability hazard, indicating significant potential for compressibility problems. This should be confirmed by on site intrusive investigations.

5.1.6 Shallow foundations are unlikely to be suitable given the high building loadings and the possible made ground. Foundation design should be confirmed by a site investigation.

5.2 Other Constraints

5.2.1 The presence and thickness of the alleged landfill material beneath the site is unknown and will need to be confirmed by an intrusive site investigation, or further details from the EA.

6.0 CONCLUSIONS AND RECOMMENDATIONS

6.1 Environmental

6.1.1 The site is recorded by the Environment Agency to be on the site of a former landfill between 1970 and 1979. However, historical mapping in 1975 shows no evidence of a landfill site. Geological mapping from 2000 shows an area of made ground only in the north-west corner of the recorded landfill site, which is well outside the subject area of this report. Intrusive site investigations are required to investigate the presence and depth of the possible landfill site beneath the property boundary.

6.1.2 The site has been used as a car park since 1979 which is still active today.

6.1.3 The risk of shallow subsurface contaminants, including any landfill material, migrating to the Principal Aquifer in the bedrock beneath the site is dependent on the nature of the clayey and sandy silts which are mapped by the BGS beneath the site.

6.1.4 The risks to human health from the made ground and previous historical activity onsite has been identified as moderate to low, except for the risk of ground gas which has been identified as high. The risk to controlled waters is identified as moderate to low.

6.1.5 Based on the limited available information, it has been assumed that any landfill maybe present only at shallow depths, overlying the superficial clayey and sandy silts. This is due to OS and BGS evidence contradicting the existence of the recorded landfill site, as well as 2002 BGS mapping showing made ground only in the north east corner of the alleged landfill site boundary, circa 500m from the subject area of this report.

6.1.6 The above conclusions should be confirmed with an intrusive site investigation.

6.2 Geotechnical

6.2.1 BGS GeoSure data indicates there is a moderate maximum compressible ground stability hazard, which should be accounted for during construction design.

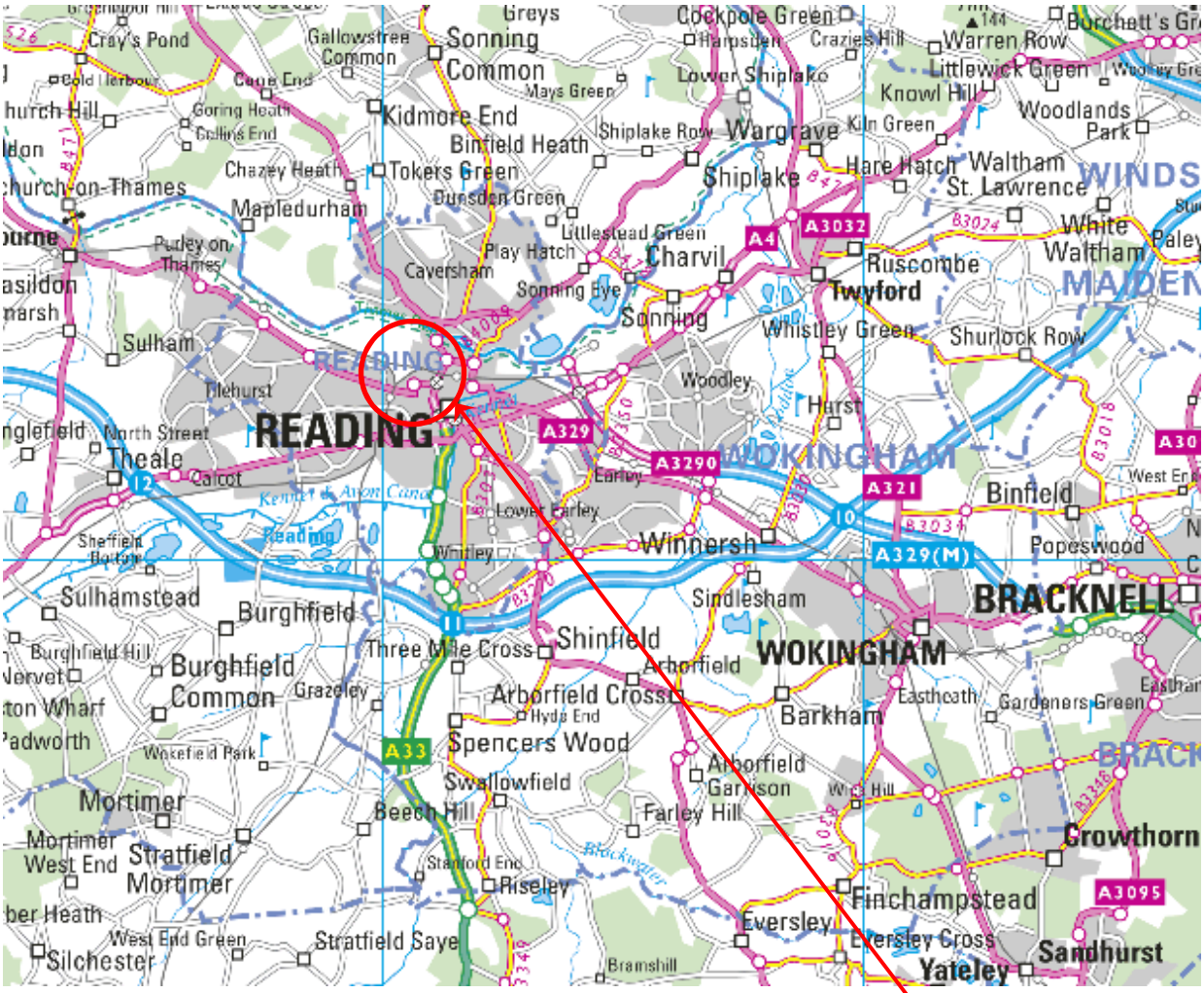
6.2.2 The presence and thickness of the alleged landfill site is unknown and may present a risk in terms of ground stability

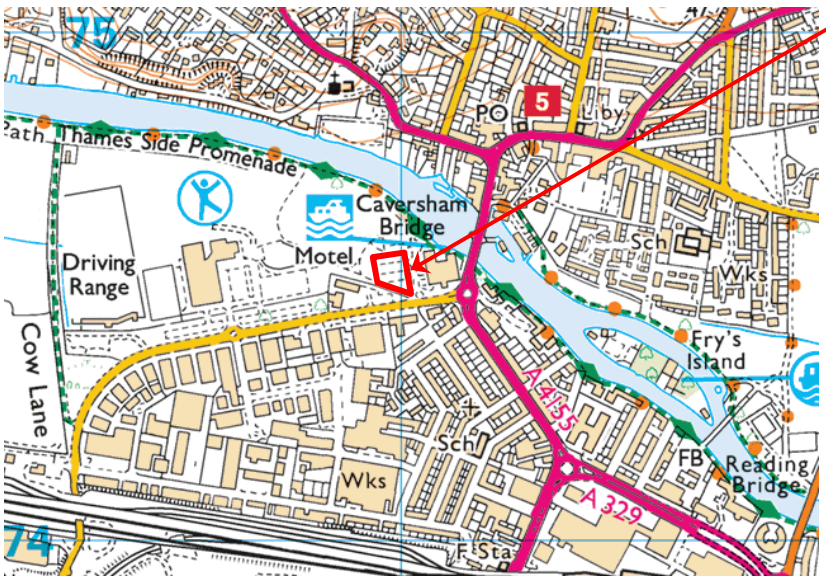
6.3 Further Work

6.3.1 Therefore to allow future development of the site the following further works are recommended, although this list is not exhaustive and should be read in conjunction with any planning conditions that are applicable to the site.

- Intrusive site investigations targeting the recorded landfill deposits and made ground and providing information for foundation design.
- Design of remedial strategy if required.
- Confirmation of remedial strategy with the Local Authority.

DRAWINGS





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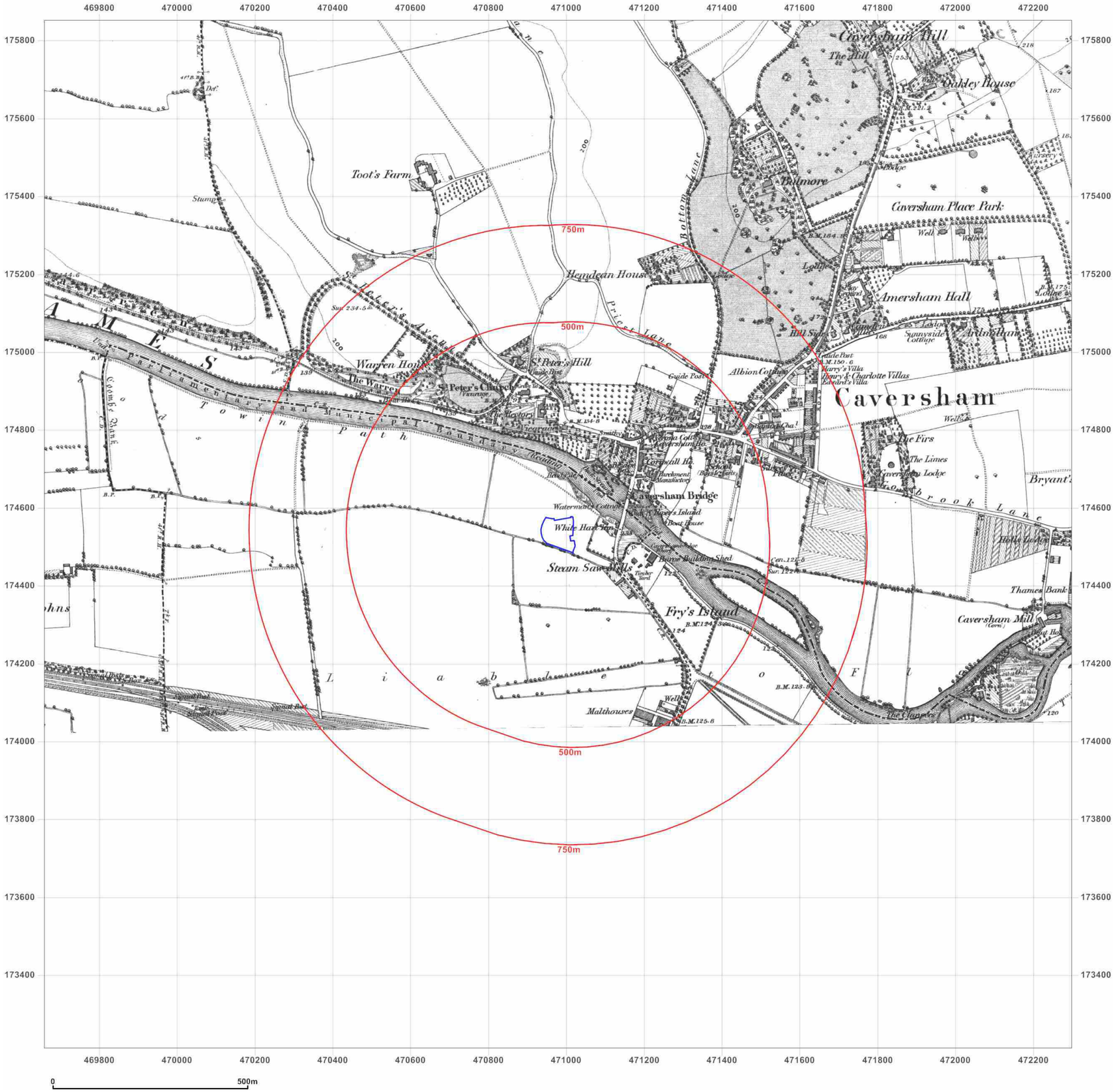
Site Location Plan

Drawing Number C3932/01

Scale: NTS

Drawn By: TM	Checked By: xx

APPENDIX A
HISTORICAL MAPS



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Site Details:

Redefine Hotel,Richfield Avenue,Reading,RG1 8EQ

Client Ref: EMS_481169_645555
Report Ref: EMS-481169_645555
Grid Ref: 470978, 174532

Map Name: County Series

Map date: **1878**

Scale: 1:10,560

Printed at: 1:10,560

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Surveyed 1878
Revised 1878
Edition N/A
Copyright N/A
Levelled N/A

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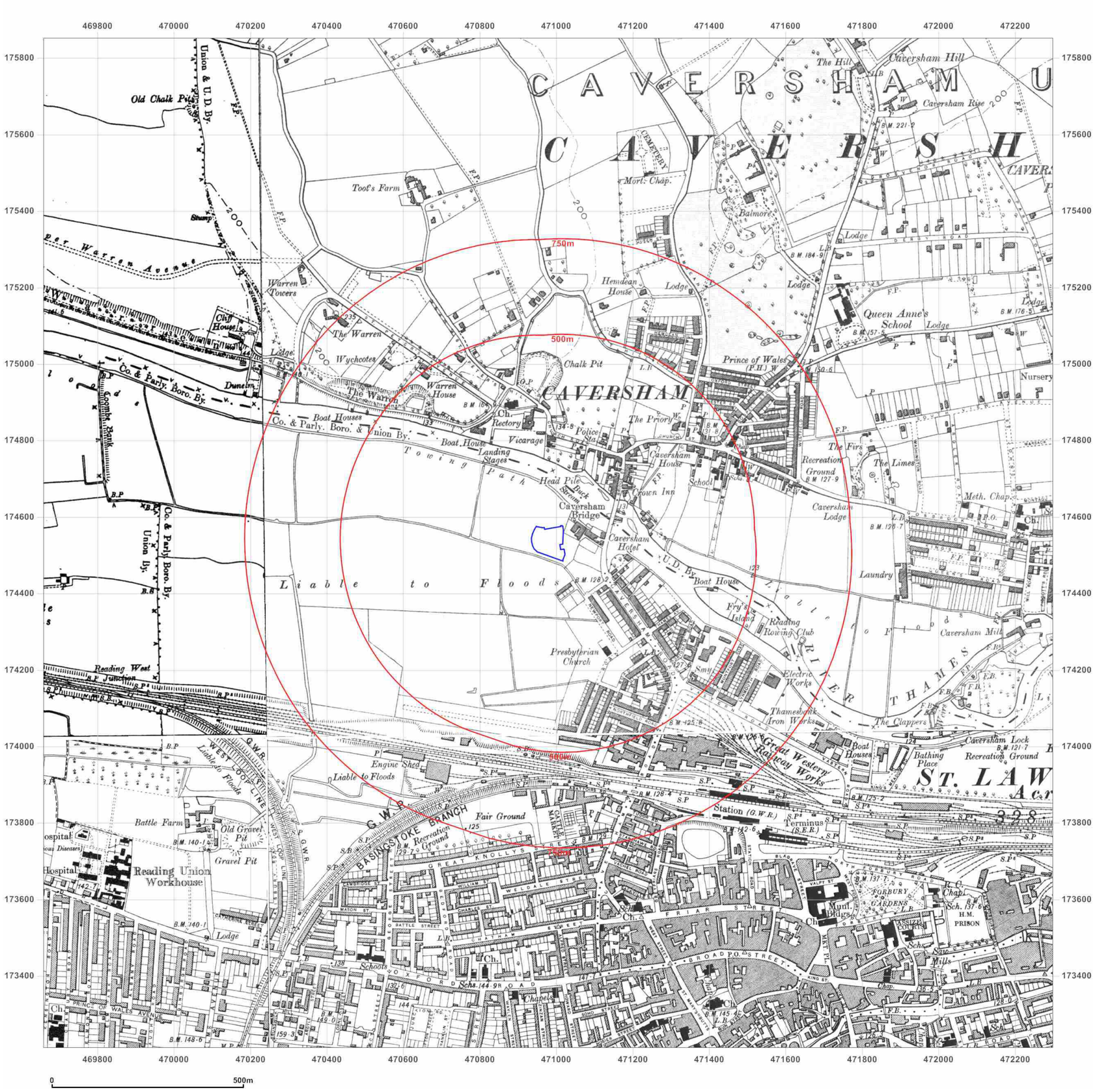
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Client Ref: EMS_481169_645555
Report Ref: EMS-481169_645555
Grid Ref: 470978, 174532

Map Name: County Series

Map date: **1897-1900**

Scale: 1:10,560

Printed at: 1:10,560

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

Surveyed 1877
Revised 1897
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1877
Revised 1898
Edition 1900
Copyright N/A
Levelled N/A

Surveyed 1877
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Client Ref: EMS_481169_645555
Report Ref: EMS-481169_645555
Grid Ref: 470978, 174532

Map Name: County Series

Map date: **1910-1913**

Scale: 1:10,560

Printed at: 1:10,560

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Surveyed 1877
Revised 1910
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1877
Revised 1910
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1877
Revised 1910
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1877
Revised 1910
Edition 1913
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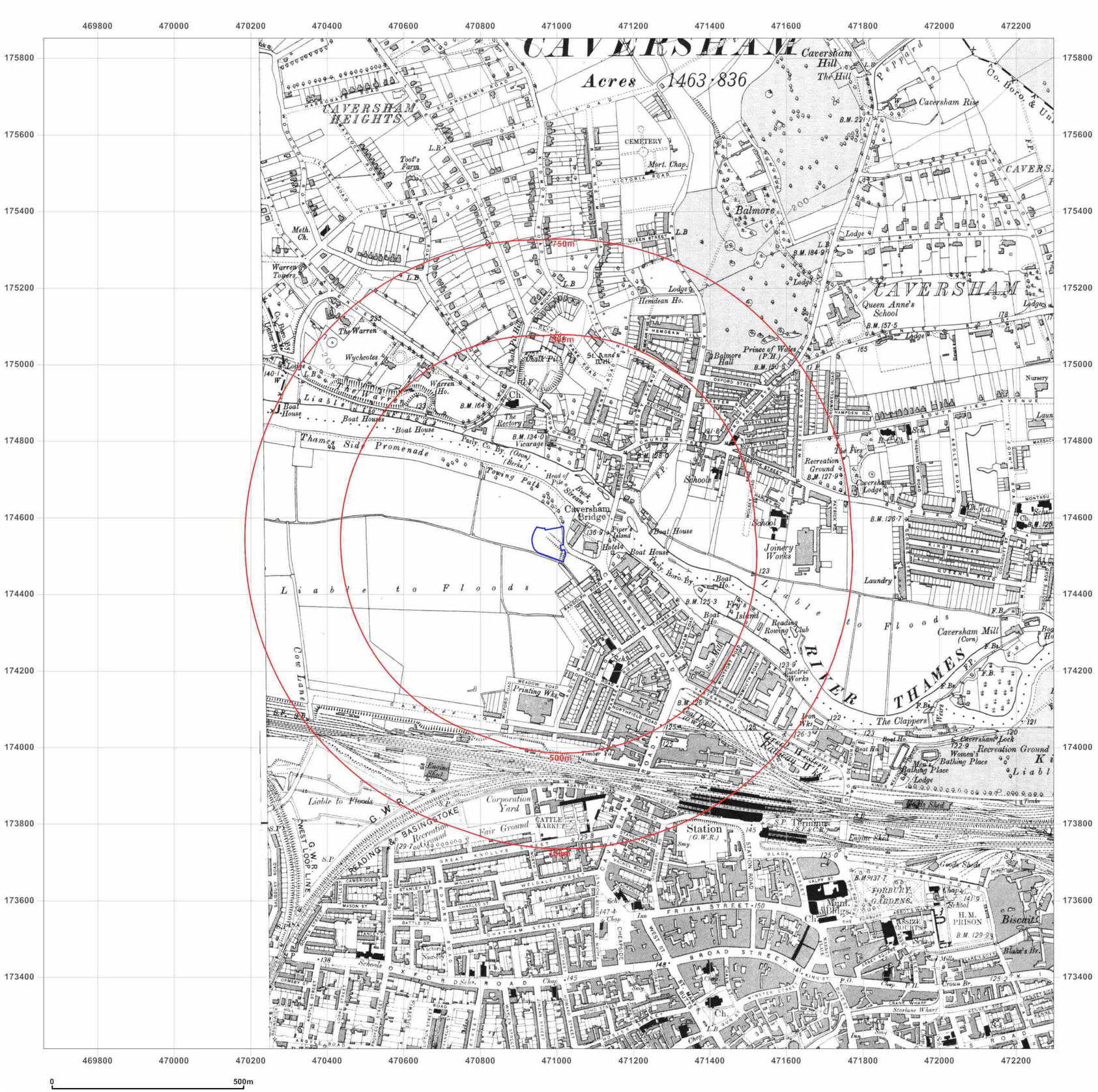
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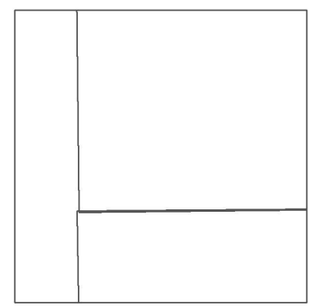
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Printed at: 1:10,560

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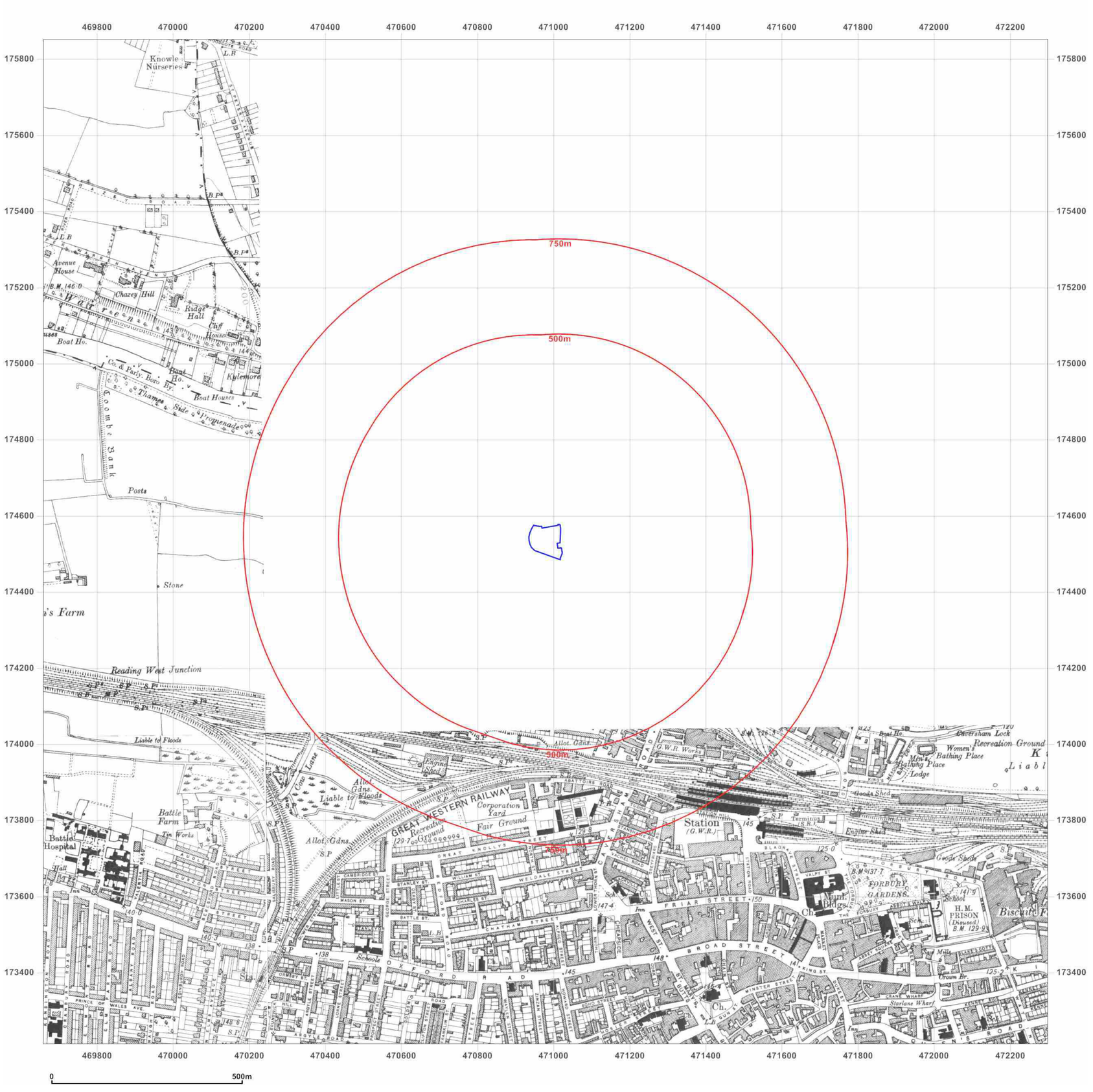
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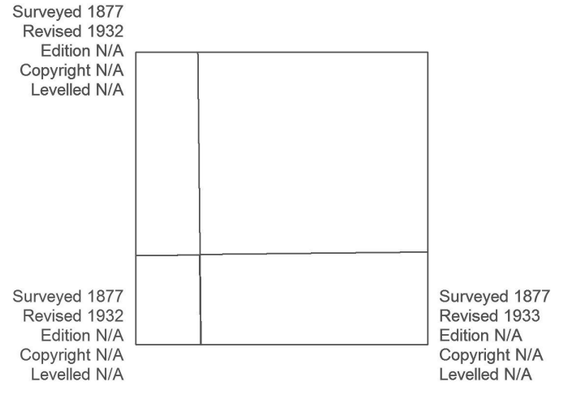
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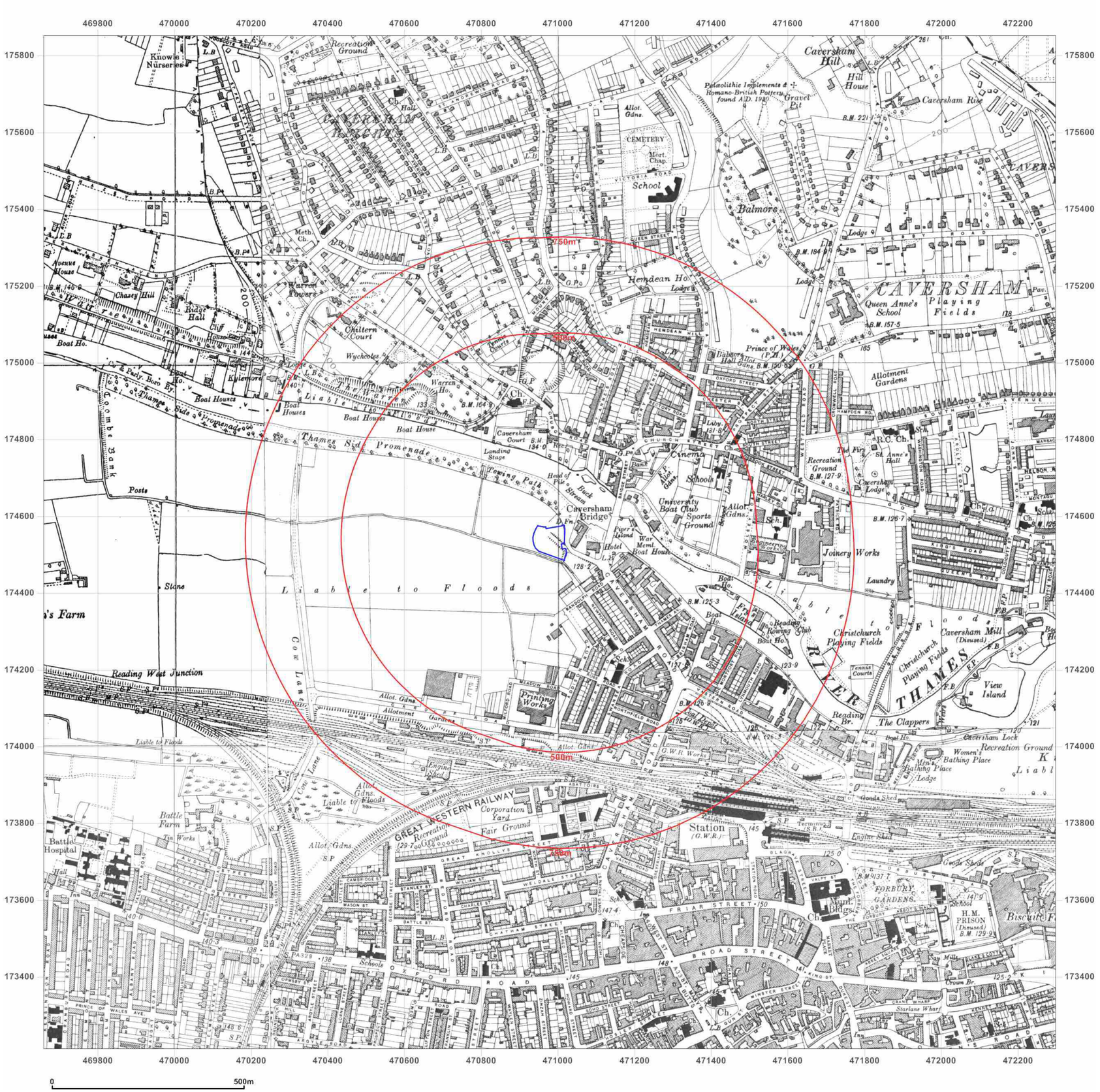
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Report Ref: EMS-481169_645555
Grid Ref: 470978, 174532

Map Name: County Series

Map date: **1938**

Scale: 1:10,560

Printed at: 1:10,560

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Surveyed N/A Revised N/A Edition 1938 Copyright N/A Levelled N/A	Surveyed 1877 Revised 1938 Edition N/A Copyright N/A Levelled N/A
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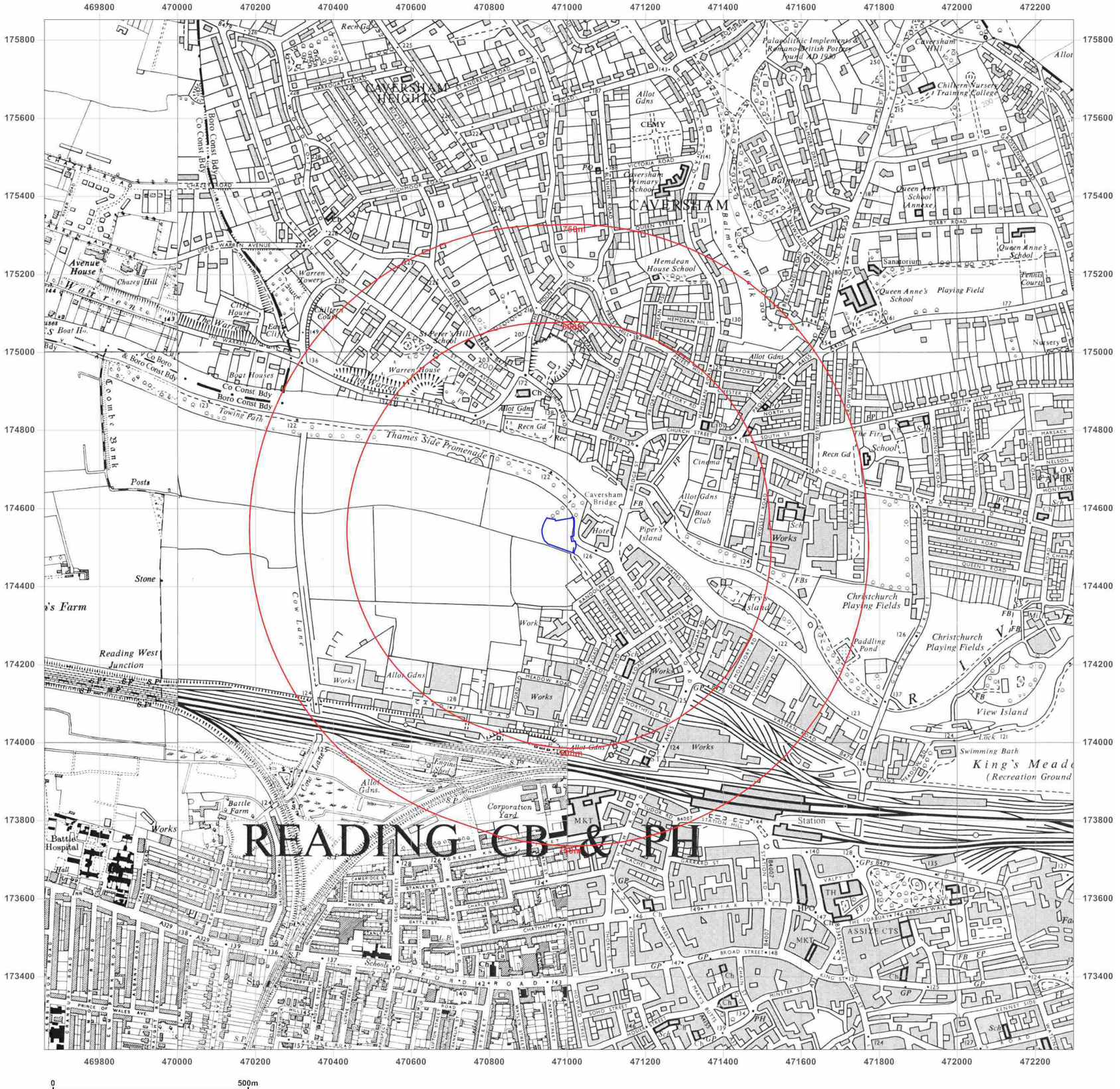
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Client Ref: EMS_481169_645555
Report Ref: EMS-481169_645555
Grid Ref: 470978, 174532

Map Name: Provisional

Map date: **1960-1962**

Scale: 1:10,560

Printed at: 1:10,560

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Surveyed 1956
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Surveyed 1877
Revised 1956
Edition N/A
Copyright 1961
Levelled N/A

Surveyed N/A
Revised 1960
Edition 1961
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Surveyed 1959
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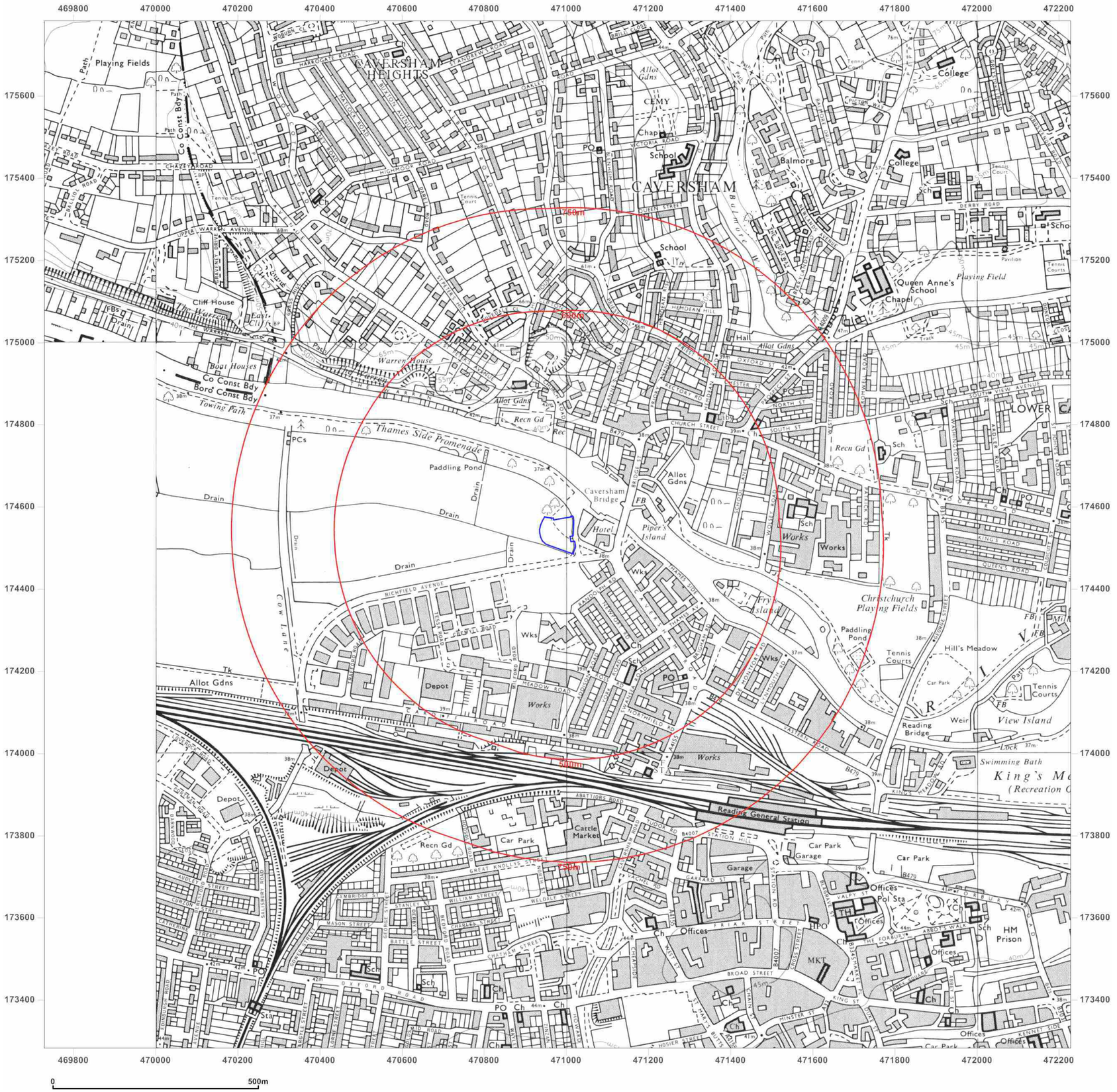
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Client Ref: EMS_481169_645555
Report Ref: EMS-481169_645555
Grid Ref: 470978, 174532

Map Name: National Grid

Map date: **1970-1973**

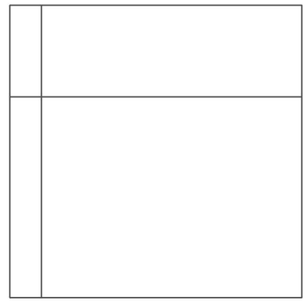
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Copyright 1970
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Surveyed 1971
Revised 1973
Edition N/A
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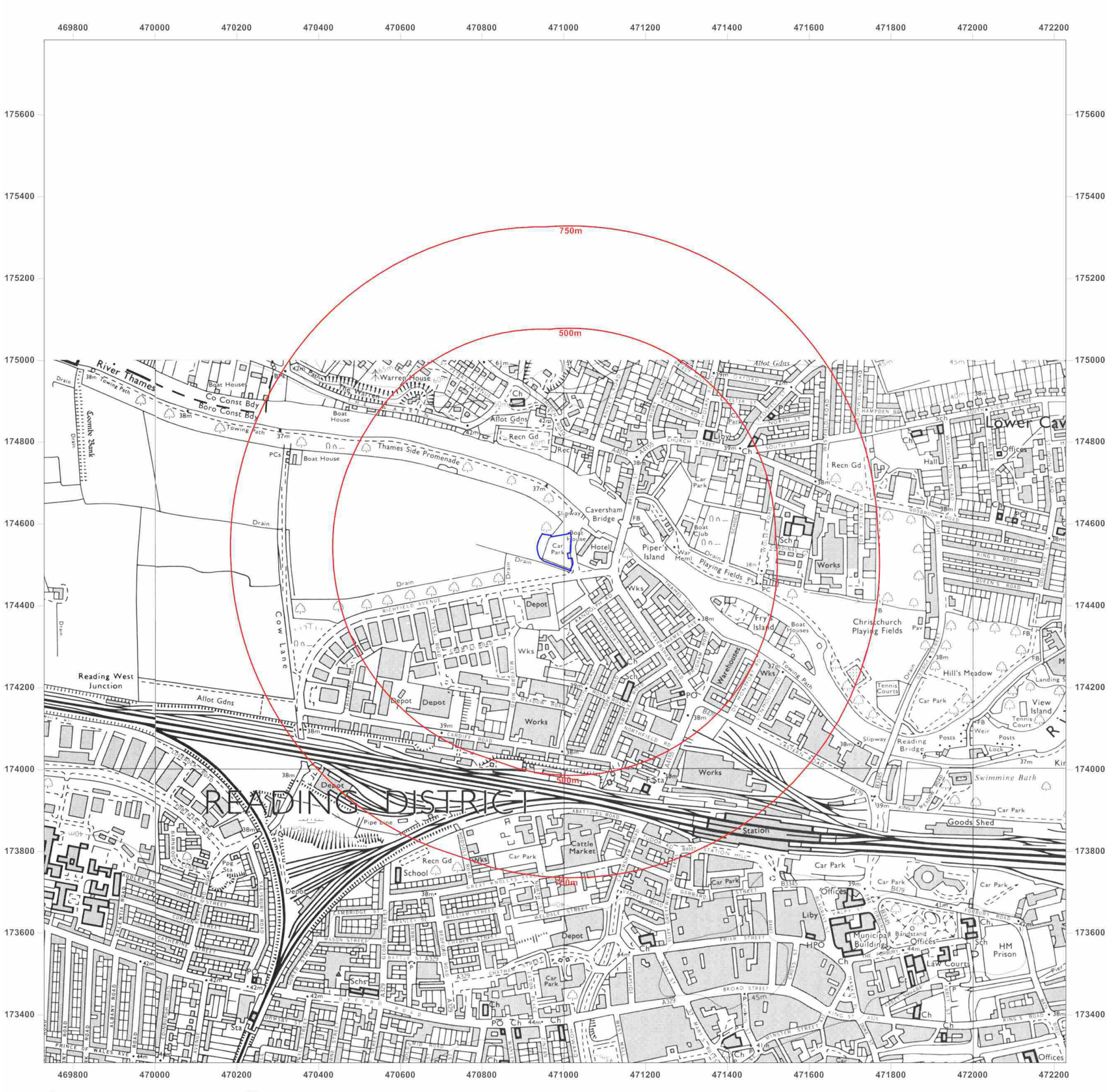
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Grid Ref: 470978, 174532

Map Name: National Grid

Map date: **1976-1979**

Scale: 1:10,000

Printed at: 1:10,000

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Copyright 1976
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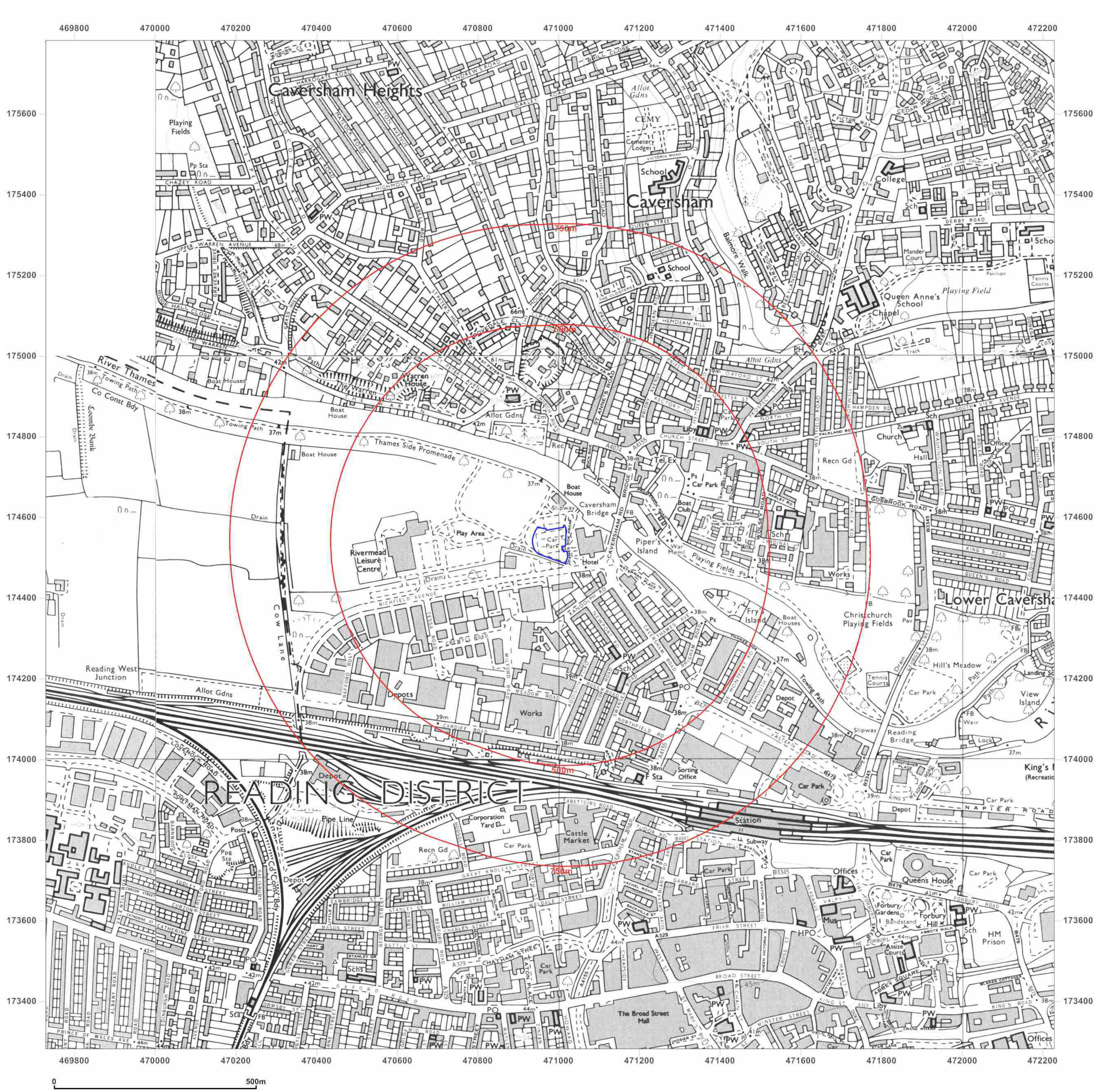
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Client Ref: EMS_481169_645555
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Grid Ref: 470978, 174532

Map Name: National Grid

Map date: **1989-1991**

Scale: 1:10,000

Printed at: 1:10,000

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Revised 1990
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1990
Revised 1991
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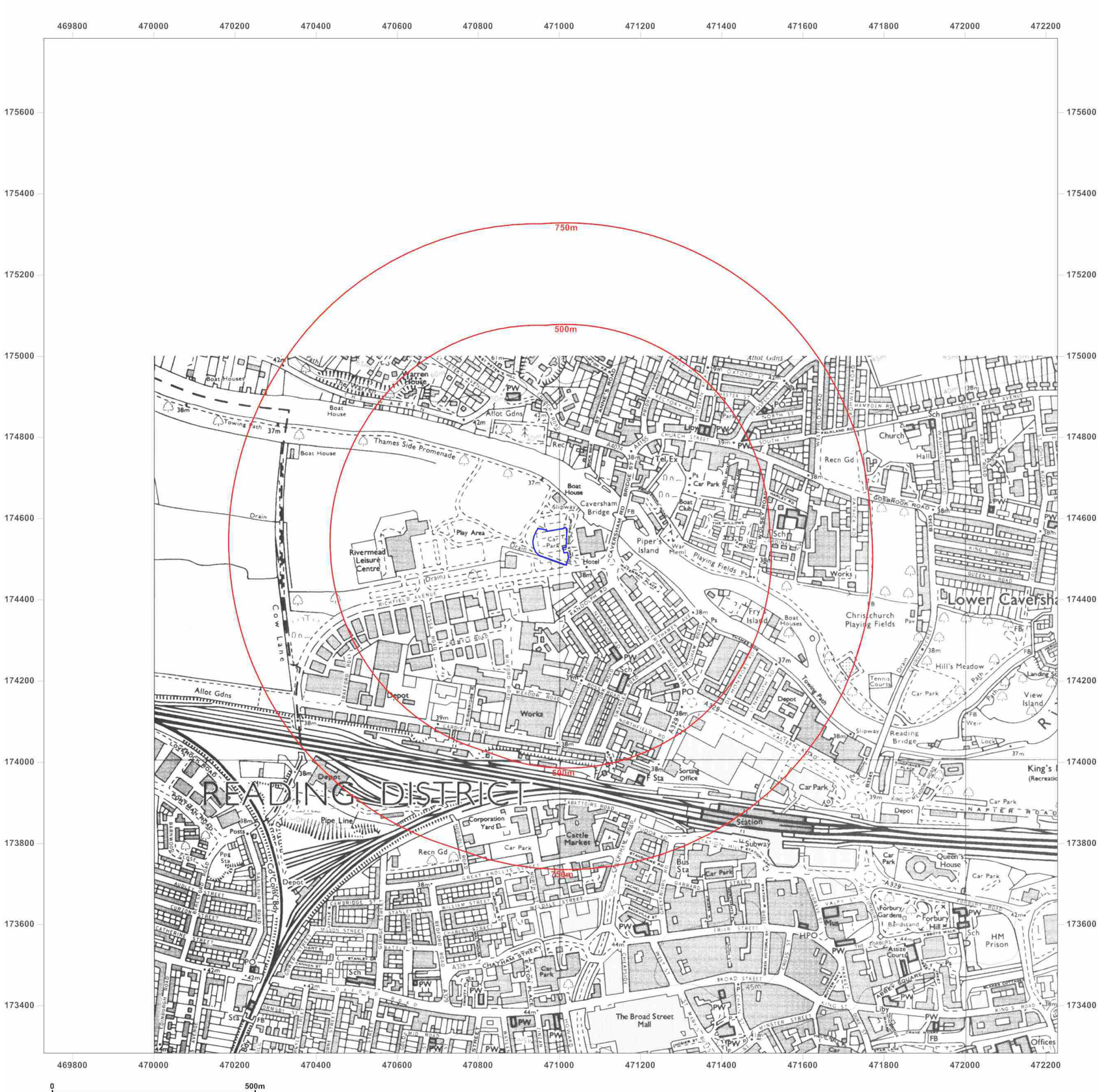
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Report Ref: EMS-481169_645555
Grid Ref: 470978, 174532

Map Name: National Grid

Map date: **1994**

Scale: 1:10,000

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Revised 1994
Edition N/A
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Report Ref: EMS-481169_645555
Grid Ref: 470978, 174532

Map Name: 1:10,000 Raster

Map date: **2002**

Scale: 1:10,000

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Client Ref: EMS_481169_645555
Report Ref: EMS-481169_645555
Grid Ref: 470978, 174532

Map Name: National Grid

Map date: **2010**

Scale: 1:10,000

Printed at: 1:10,000

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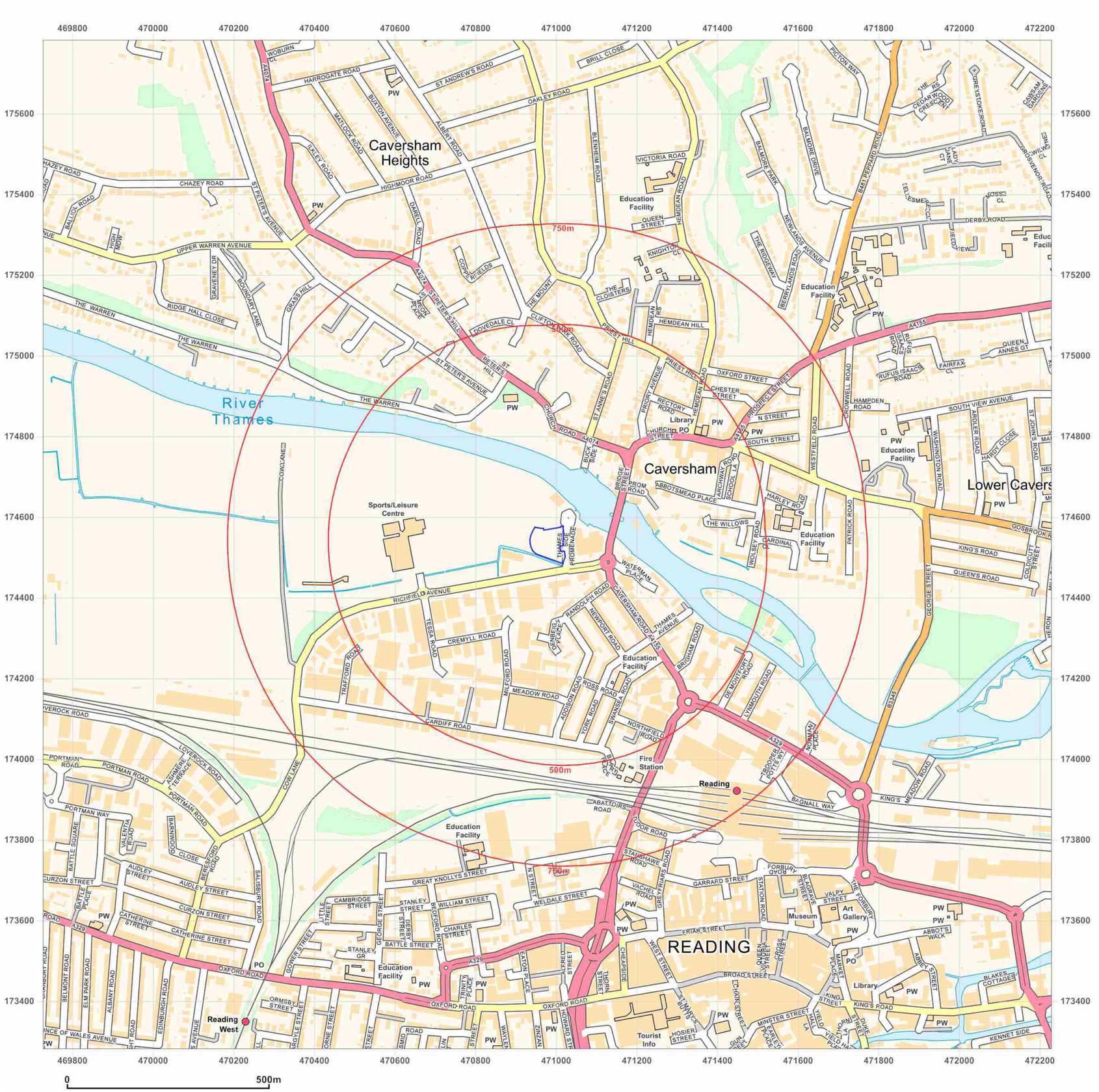
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Client Ref: EMS_481169_645555
Report Ref: EMS-481169_645555
Grid Ref: 470978, 174532

Map Name: National Grid

Map date: **2014**

Scale: 1:10,000

Printed at: 1:10,000

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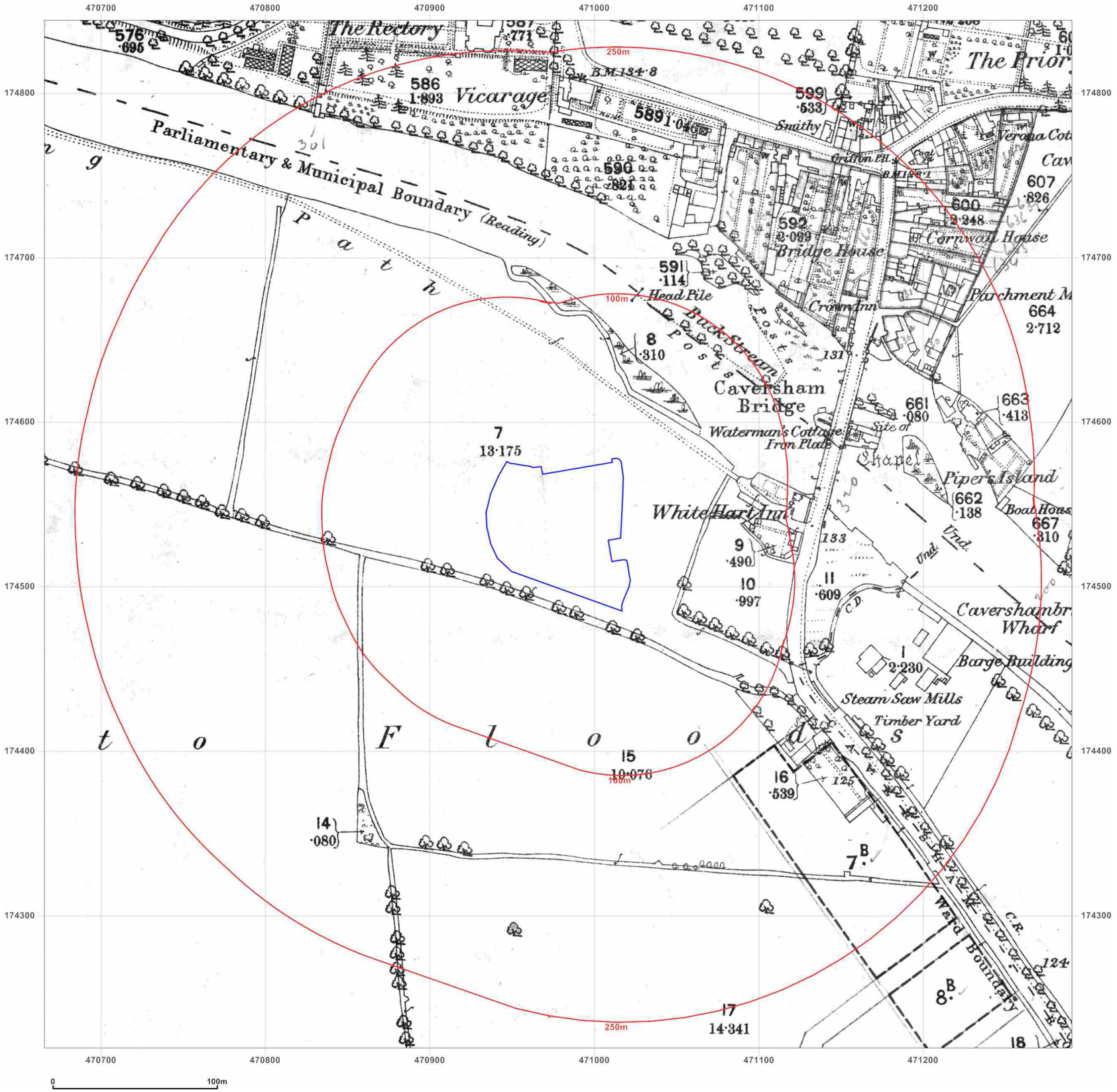
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Client Ref: EMS_481169_645555
Report Ref: EMS-481169_645555
Grid Ref: 470978, 174532

Map Name: County Series

Map date: **1877**

Scale: 1:2,500

Printed at: 1:2,500

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Surveyed 1877
Revised 1877
Edition N/A
Copyright N/A
Levelled N/A

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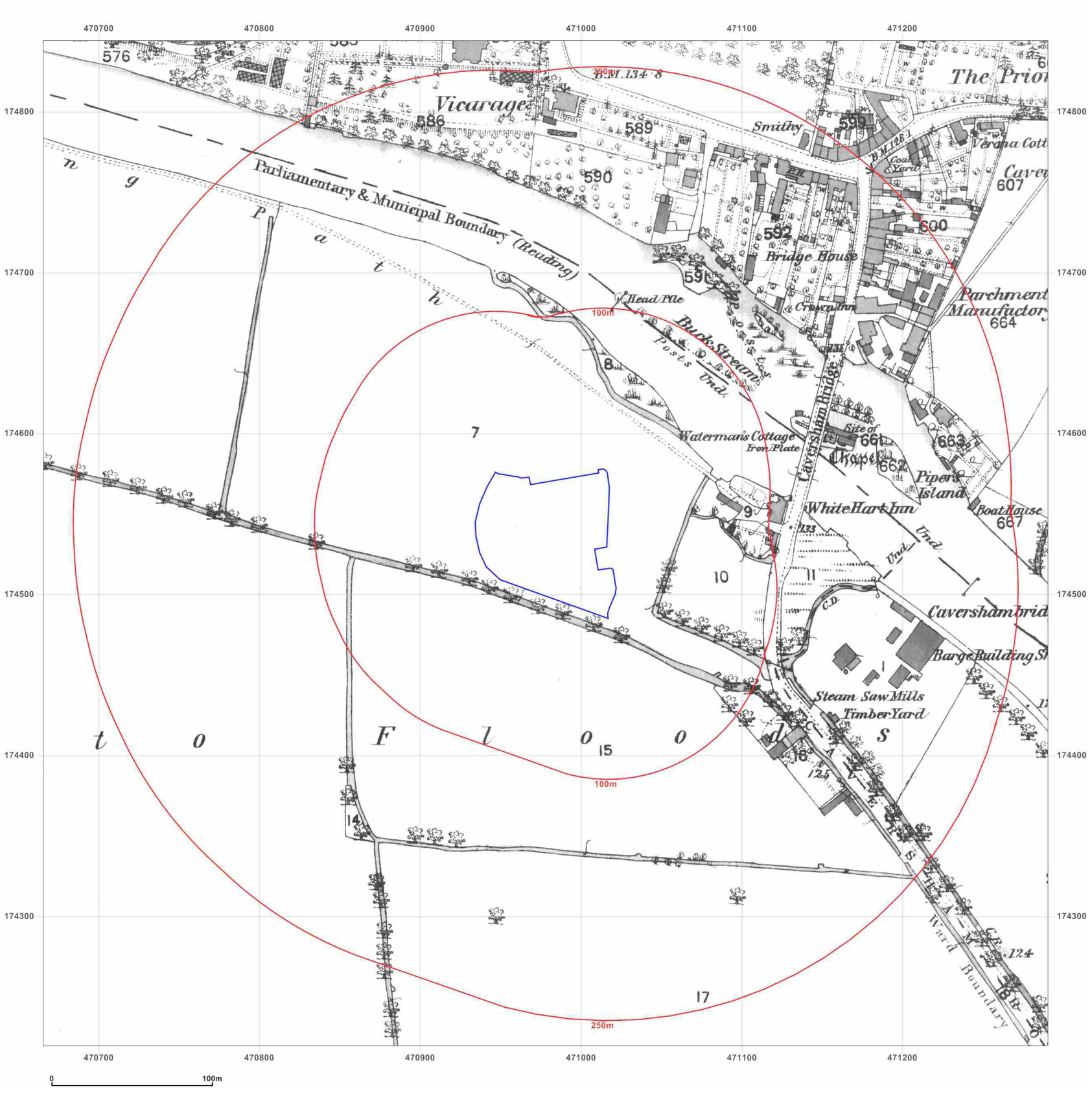
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Client Ref: EMS_481169_645555
Report Ref: EMS-481169_645555
Grid Ref: 470978, 174532

Map Name: County Series

Map date: **1881**

Scale: 1:2,500

Printed at: 1:2,500

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Revised 1881
Edition N/A
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Levelled N/A

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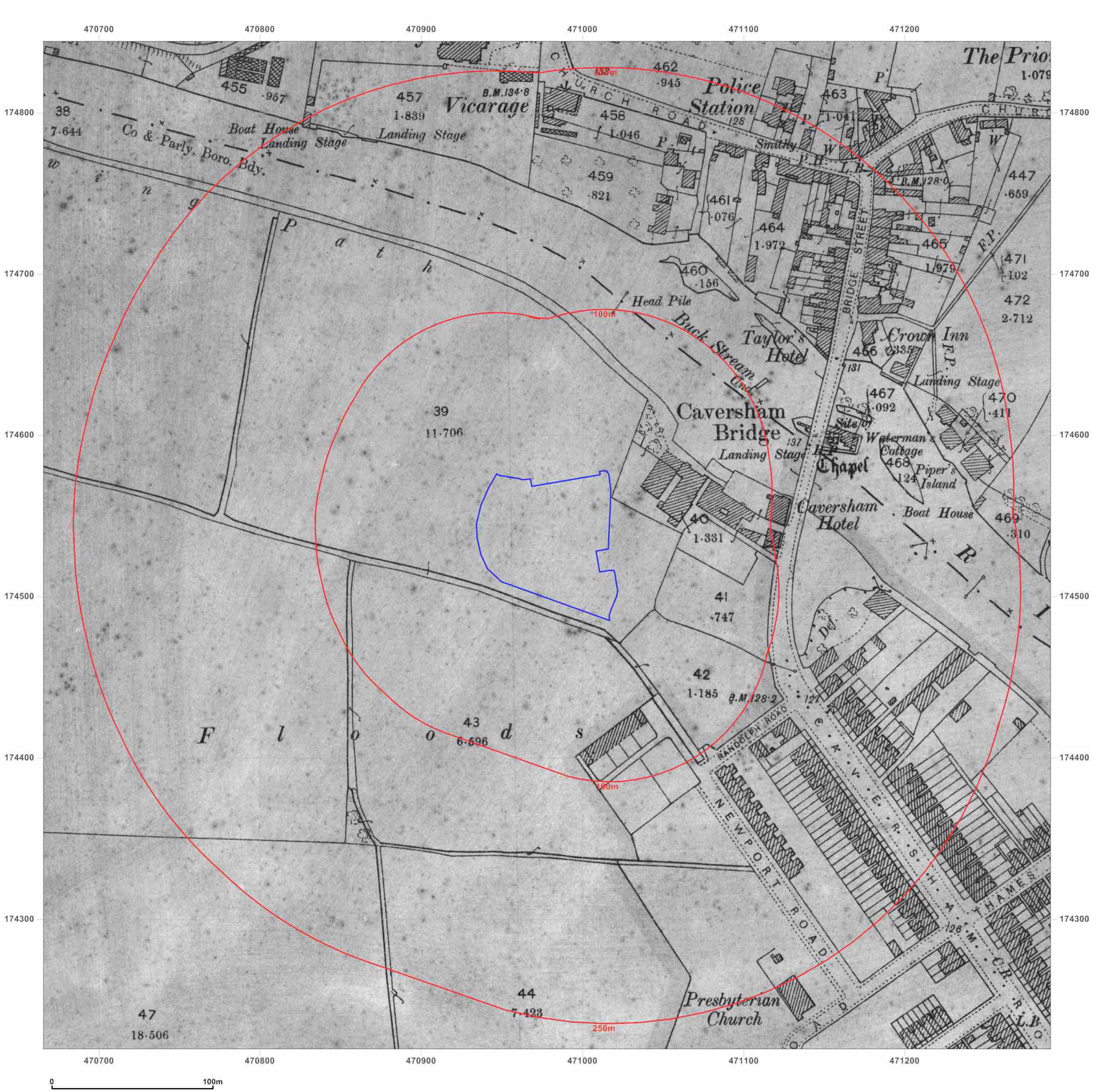
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Client Ref: EMS_481169_645555
Report Ref: EMS-481169_645555
Grid Ref: 470978, 174532

Map Name: County Series

Map date: **1899**

Scale: 1:2,500

Printed at: 1:2,500

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

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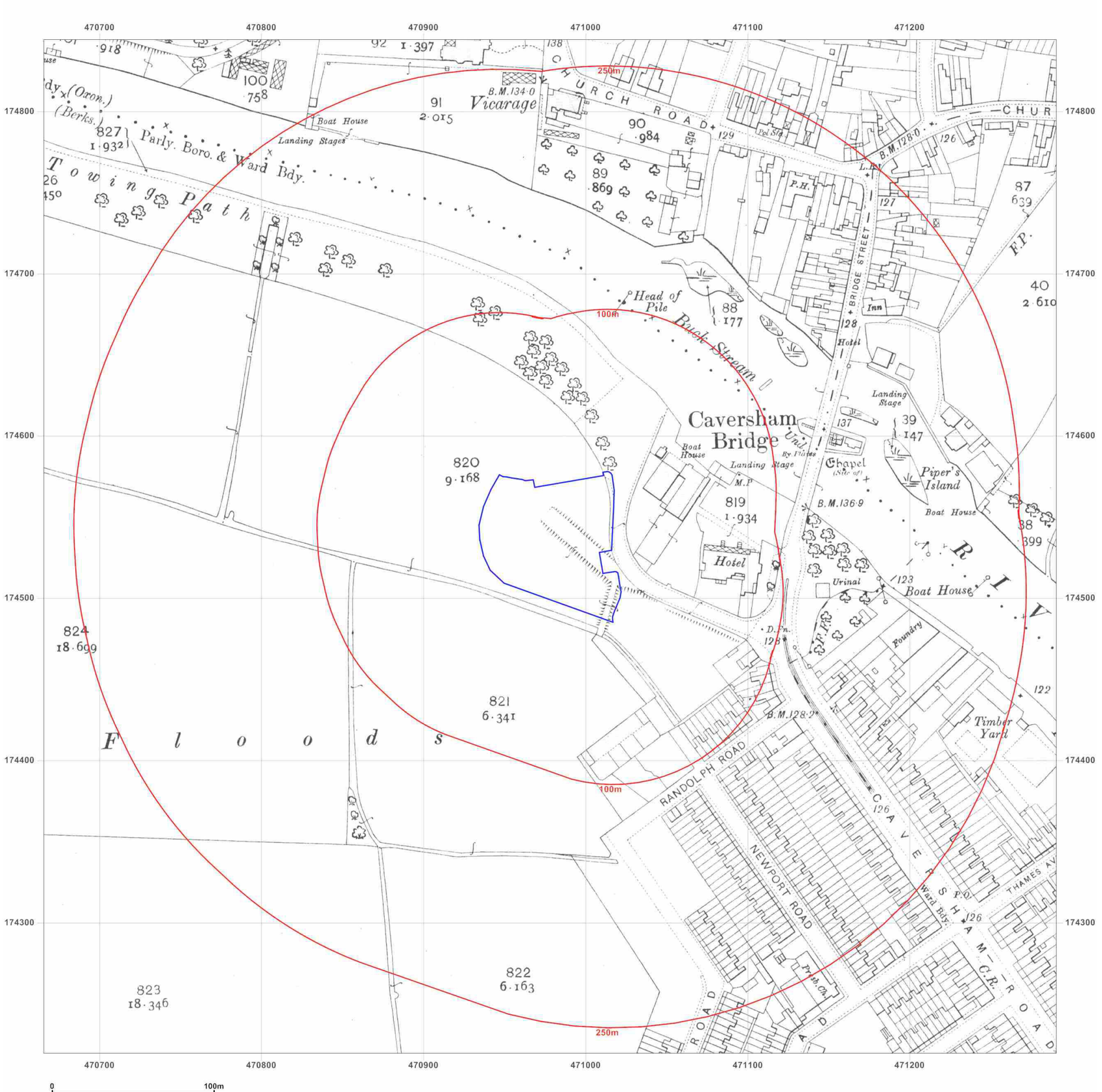
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Client Ref: EMS_481169_645555
Report Ref: EMS-481169_645555
Grid Ref: 470978, 174532

Map Name: County Series

Map date: **1913**

Scale: 1:2,500

Printed at: 1:2,500

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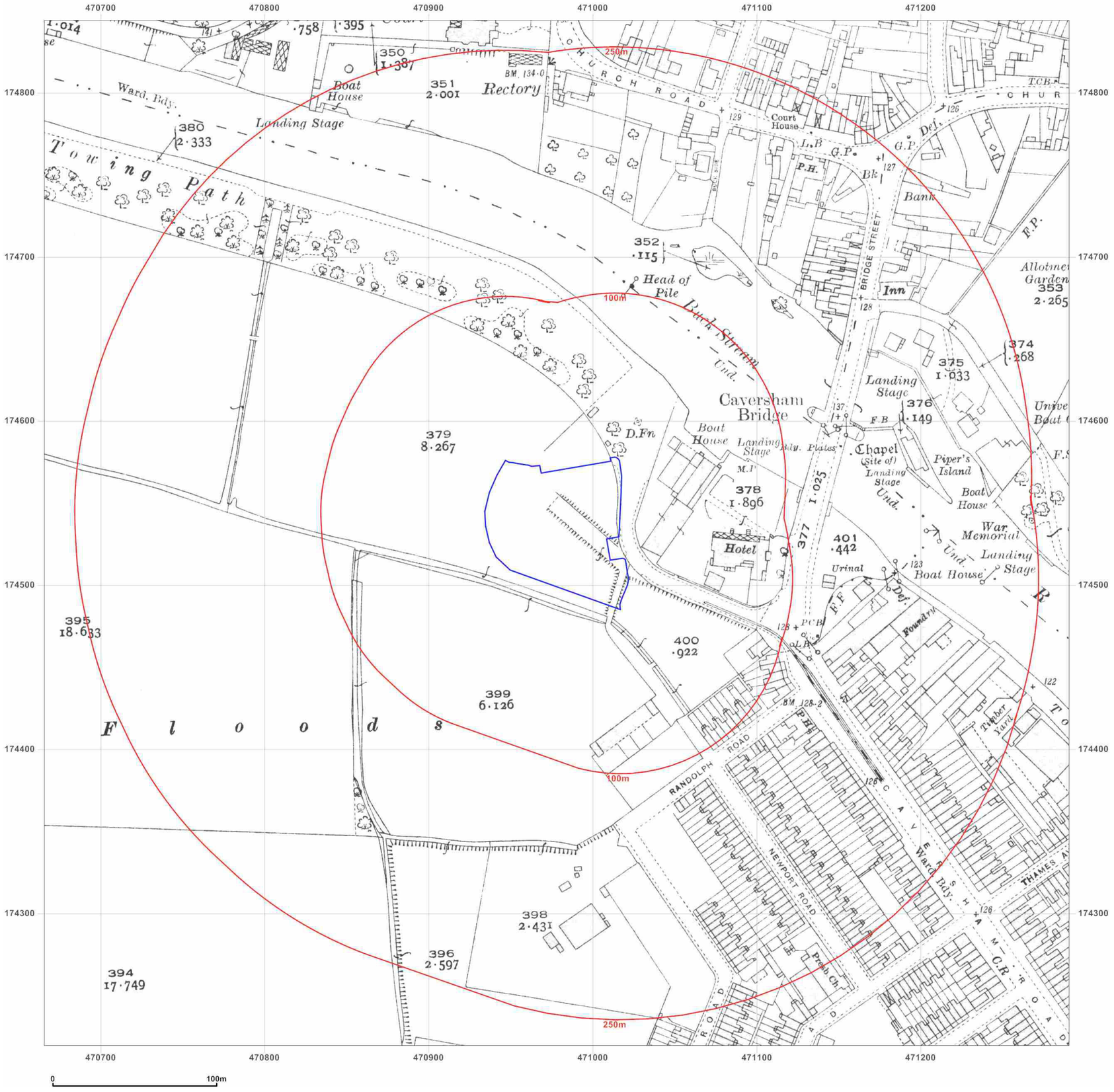
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Grid Ref: 470978, 174532

Map Name: County Series

Map date: **1932**

Scale: 1:2,500

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Revised 1932
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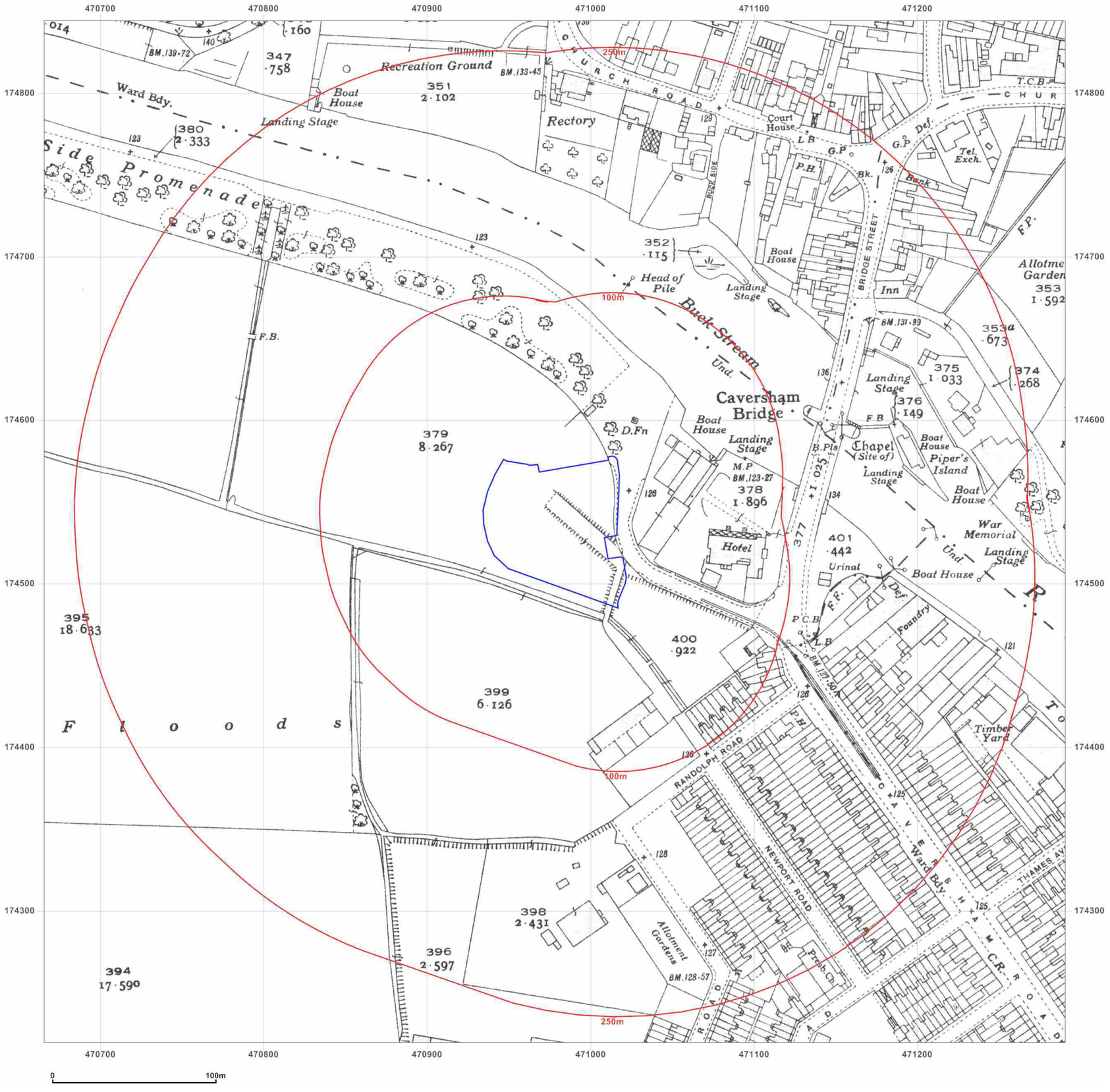
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Map Name: County Series

Map date: **1936**

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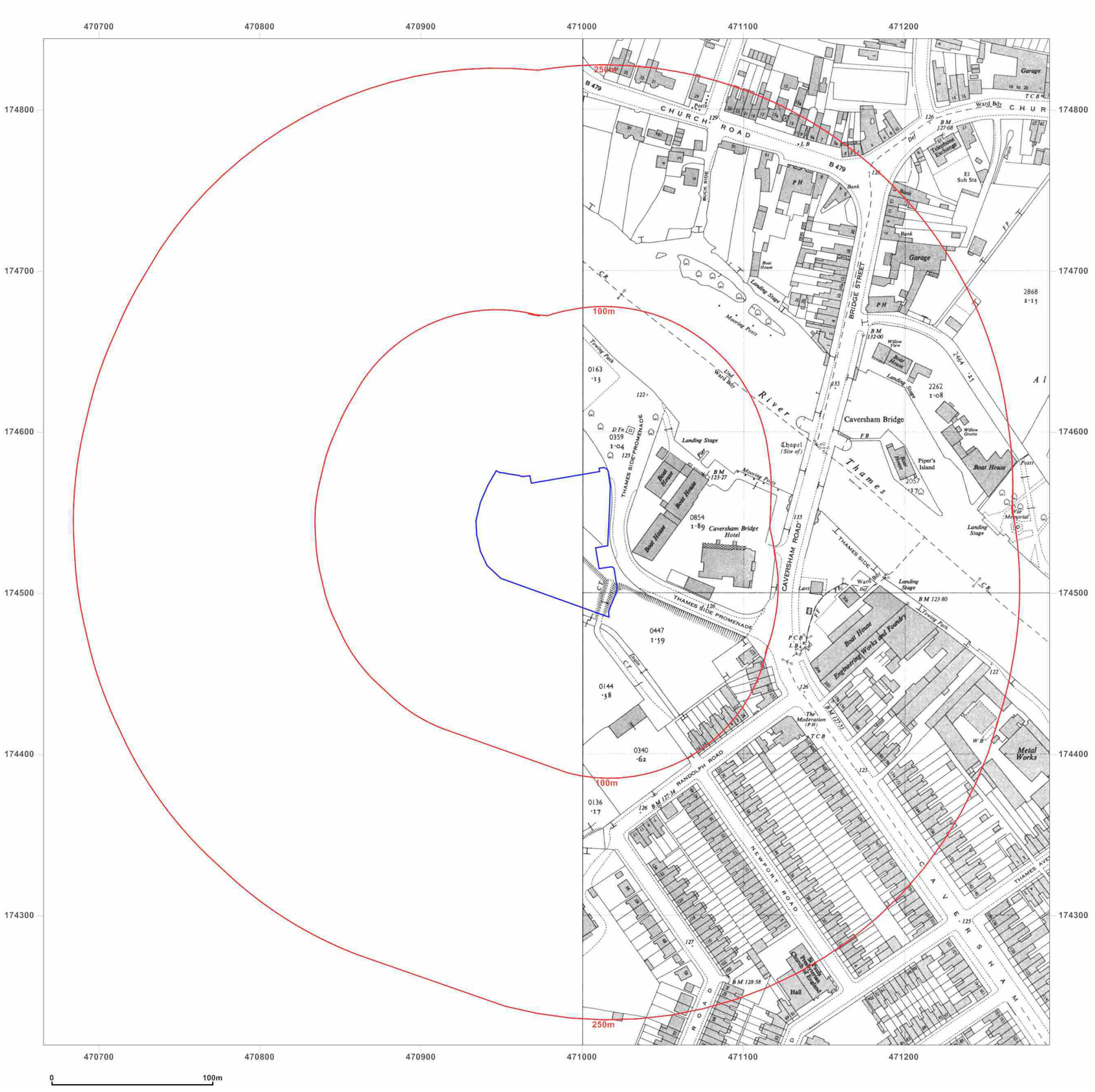
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Map Name: National Grid

Map date: **1956**

Scale: 1:2,500

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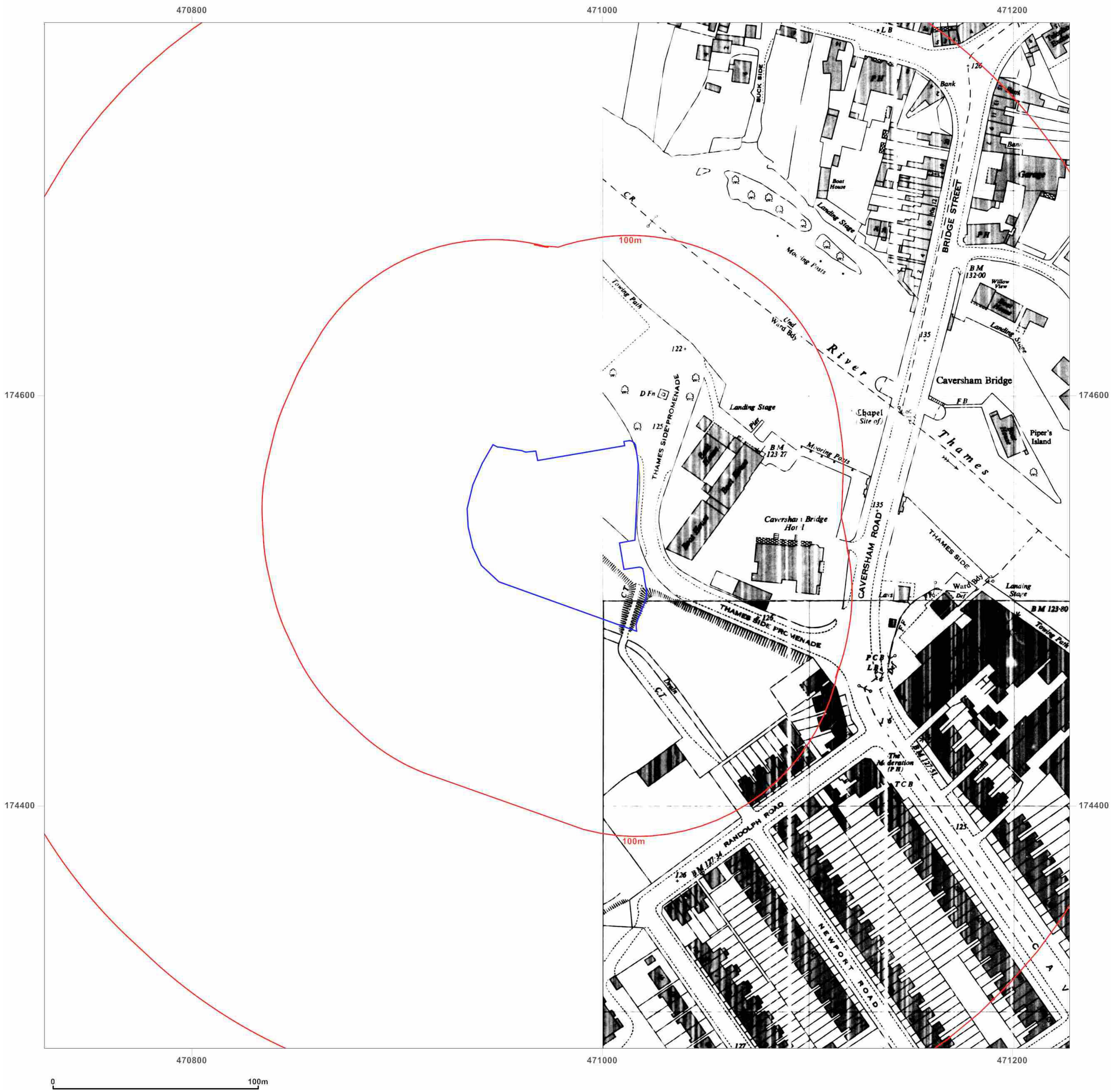
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Map Name: National Grid

Map date: **1957**

Scale: 1:1,250

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Map Name: National Grid

Map date: **1956-1959**

Scale: 1:1,250

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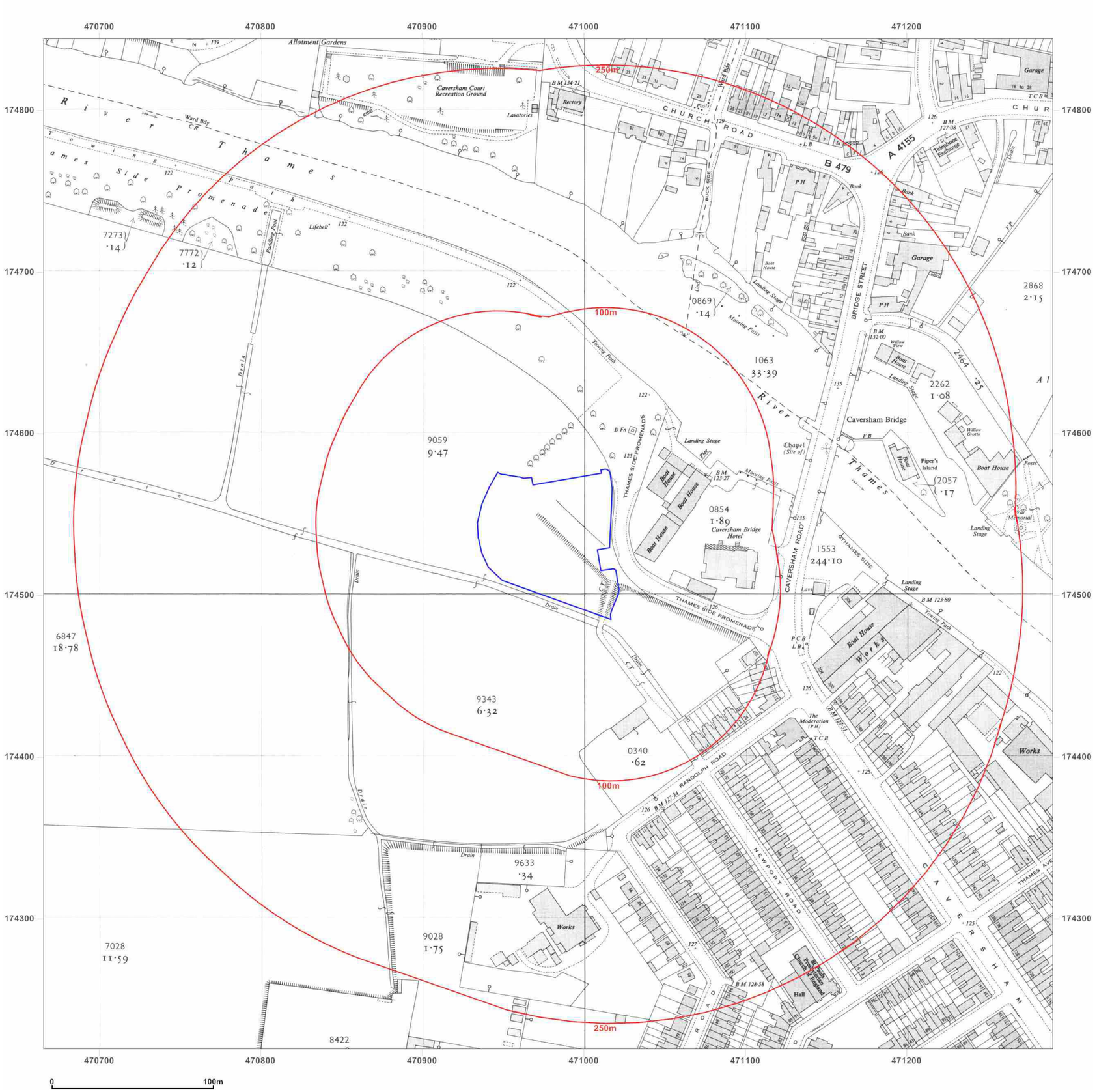
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Map Name: National Grid

Map date: **1959**

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Map Name: National Grid

Map date: **1970-1971**

Scale: 1:1,250

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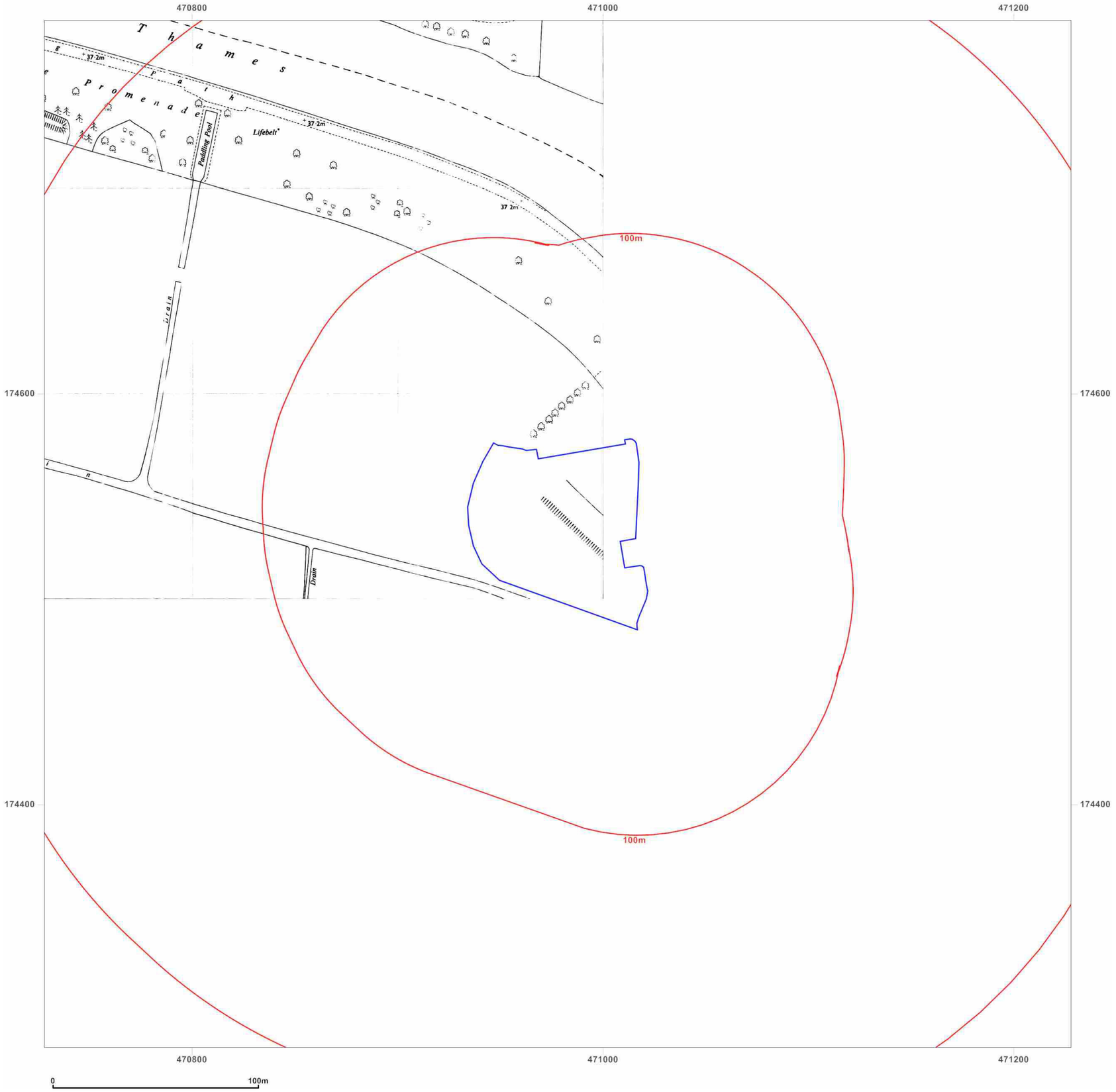
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Map Name: National Grid

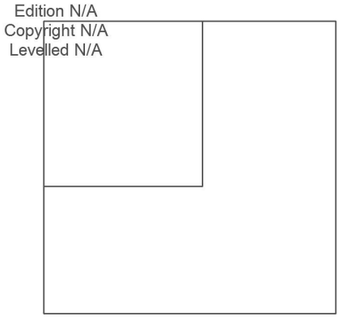
Map date: **1976**

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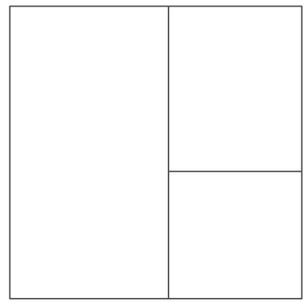
Map Name: National Grid

Map date: **1982**

Scale: 1:1,250

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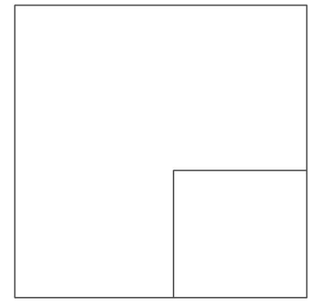
Map Name: National Grid

Map date: **1984**

Scale: 1:1,250

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Map Name: National Grid

Map date: **1984-1988**

Scale: 1:1,250

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Report Ref: EMS-481169_645555
Grid Ref: 470978, 174532

Map Name: National Grid

Map date: **1989-1993**

Scale: 1:1,250

Printed at: 1:2,000

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APPENDIX B
GroundSure Report

EmapSite

Masdar House, 1 Reading Road,
Eversley, RG27 0RP

Groundsure Reference:	EMS-481169_645556
Your Reference:	EMS_481169_645556
Report Date	30 May 2018
Report Delivery Method:	Email - pdf

Enviro Insight

Address: Redefine Hotel, Richfield Avenue, Reading, RG1 8EQ,

Dear Sir/ Madam,

Thank you for placing your order with Groundsure. Please find enclosed the **Groundsure Enviro Insight** as requested.

If you would like further assistance regarding this report then please contact the emapsite customer services team on 0118 9736883 quoting the above report reference number.

Yours faithfully,

emapsite customer services team

Enc.
Groundsure Enviroinsight

Enviro Insight

Address:	**Redefine Hotel, Richfield Avenue, Reading, RG1 8EQ,**
Date:	**30 May 2018**
Reference:	**EMS-481169_645556**
Client:	**EmapSite**

NW N NE

W E



SW S SE

Aerial Photograph Capture date:	20-Apr-2015
Grid Reference:	470980,174536
Site Size:	0.58ha

Report Reference: EMS-481169_645556
Client Reference: EMS_481169_645556

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Overview of Findings

For further details on each dataset, please refer to each individual section in the main report as listed. Where the database has been searched a numerical result will be recorded. Where the database has not been searched '-' will be recorded.

Section 1: Historical Industrial Sites	On-site	0-50	51-250	251-500
1.1 Potentially Contaminative Uses identified from 1:10,000 scale mapping	2	3	21	88
1.2 Additional Information – Historical Tank Database	0	0	2	28
1.3 Additional Information – Historical Energy Features Database	0	0	8	48
1.4 Additional Information – Historical Petrol and Fuel Site Database	0	0	0	0
1.5 Additional Information – Historical Garage and Motor Vehicle Repair Database	0	0	6	10
1.6 Potentially Infilled Land	2	0	2	22

Section 2: Environmental Permits, Incidents and Registers	On-site	0-50m	51-250	251-500
2.1 Industrial Sites Holding Environmental Permits and/or Authorisations				
2.1.1 Records of historic IPC Authorisations	0	0	0	0
2.1.2 Records of Part A(1) and IPPC Authorised Activities	0	0	0	0
2.1.3 Records of Red List Discharge Consents	0	0	0	0
2.1.4 Records of List 1 Dangerous Substances Inventory sites	0	0	0	4
2.1.5 Records of List 2 Dangerous Substances Inventory sites	0	0	0	0
2.1.6 Records of Part A(2) and Part B Activities and Enforcements	0	0	1	7
2.1.7 Records of Category 3 or 4 Radioactive Substances Authorisations	0	0	0	0
2.1.8 Records of Licensed Discharge Consents	0	1	2	1
2.1.9 Records of Water Industry Referrals	0	0	0	0
2.1.10 Records of Planning Hazardous Substance Consents and Enforcements within 500m of the study site	0	0	0	0
2.2 Records of COMAH and NIHHS sites	0	0	0	0
2.3 Environment Agency/Natural Resources Wales Recorded Pollution Incidents				
2.3.1 National Incidents Recording System, List 2	1	1	2	4
2.3.2 National Incidents Recording System, List 1	0	0	0	0
2.4 Sites Determined as Contaminated Land under Part 2A EPA 1990	0	0	0	0

Section 3: Landfill and Other Waste Sites	On-site	0-50m	51-250	251-500	501-1000	1000-1500
3.1 Landfill Sites						
3.1.1 Environment Agency/Natural Resources Wales Registered Landfill Sites	0	0	0	0	0	Not searched
3.1.2 Environment Agency/Natural Resources Wales Historic Landfill Sites	1	0	0	0	1	0
3.1.3 BGS/DoE Landfill Site Survey	0	0	0	0	0	0
3.1.4 Records of Landfills in Local Authority and Historical Mapping Records	0	0	0	0	0	0
3.2 Landfill and Other Waste Sites Findings						
3.2.1 Operational and Non-Operational Waste Treatment, Transfer and Disposal Sites	0	0	1	0	Not searched	Not searched
3.2.2 Environment Agency/Natural Resources Wales Licensed Waste Sites	0	0	0	0	3	6

Section 4: Current Land Use	On-site	0-50m	51-250	251-500
4.1 Current Industrial Sites Data	0	0	19	Not searched
4.2 Records of Petrol and Fuel Sites	0	1	0	3
4.3 National Grid Underground Electricity Cables	0	0	0	0
4.4 National Grid Gas Transmission Pipelines	0	0	0	0

Section 5: Geology	
5.1 Records of Artificial Ground and Made Ground present beneath the study site	None identified
5.2 Records of Superficial Ground and Drift Geology present beneath the study site	Identified
5.3 For records of Bedrock and Solid Geology beneath the study site see the detailed findings section.	

Section 6: Hydrogeology and Hydrology	0-500m
6.1 Records of Strata Classification in the Superficial Geology within 500m of the study site	Identified
6.2 Records of Strata Classification in the Bedrock Geology within 500m of the study site	Identified

	On-site	0-50m	51-250	251-500	501-1000	1000-2000
6.3 Groundwater Abstraction Licences (within 2000m of the study site)	0	0	0	4	5	9
6.4 Surface Water Abstraction Licences (within 2000m of the study site)	0	0	0	3	0	3
6.5 Potable Water Abstraction Licences (within 2000m of the study site)	0	0	0	2	0	2
6.6 Source Protection Zones (within 500m of the study site)	0	0	0	0	Not searched	Not searched
6.7 Source Protection Zones within Confined Aquifer	0	0	0	0	Not searched	Not searched
6.8 Groundwater Vulnerability and Soil Leaching Potential (within 500m of the study site)	1	0	0	0	Not searched	Not searched

Section 6: Hydrogeology and Hydrology

	0-500m					
	On-site	0-50m	51-250	251-500	501-1000	1000-1500
6.9 Environment Agency/Natural Resources Wales information on river quality within 1500m of the study site	No	No	No	No	No	Yes
6.10 Ordnance Survey MasterMap Water Network entries within 500m of the site	0	2	22	16	Not searched	Not searched
6.11 Surface water features within 250m of the study site	No	Yes	Yes	Not searched	Not searched	Not searched

Section 7: Flooding

7.1 Enviroment Agency Zone 2 floodplains within 250m of the study site	Identified
7.2 Environment Agency/Natural Resources Wales Zone 3 floodplains within 250m of the study site	Identified
7.3 Risk of flooding from Rivers and the Sea (RoFRaS) rating for the study site	Low
7.4 Flood Defences within 250m of the study site	None identified
7.5 Areas benefiting from Flood Defences within 250m of the study site	None identified
7.6 Areas used for Flood Storage within 250m of the study site	None identified
7.7 Maximum BGS Groundwater Flooding susceptibility within 50m of the study site	Potential at Surface
7.8 BGS confidence rating for the Groundwater Flooding susceptibility areas	High

Section 8: Designated Environmentally Sensitive Sites

	On-site	0-50m	51-250	251-500	501-1000	1000-2000
8.1 Records of Sites of Special Scientific Interest (SSSI)	0	0	0	0	0	0
8.2 Records of National Nature Reserves (NNR)	0	0	0	0	0	0
8.3 Records of Special Areas of Conservation (SAC)	0	0	0	0	0	0
8.4 Records of Special Protection Areas (SPA)	0	0	0	0	0	0
8.5 Records of Ramsar sites	0	0	0	0	0	0
8.6 Records of Ancient Woodlands	0	0	0	0	0	0
8.7 Records of Local Nature Reserves (LNR)	0	0	0	0	0	0
8.8 Records of World Heritage Sites	0	0	0	0	0	0
8.9 Records of Environmentally Sensitive Areas	0	0	0	0	0	0

Section 8: Designated Environmentally Sensitive Sites

	On-site	0-50m	51-250	251-500	501-1000	1000-2000
8.10 Records of Areas of Outstanding Natural Beauty (AONB)	0	0	0	0	0	1
8.11 Records of National Parks	0	0	0	0	0	0
8.12 Records of Nitrate Sensitive Areas	0	0	0	0	0	0
8.13 Records of Nitrate Vulnerable Zones	1	0	0	0	1	0
8.14 Records of Green Belt land	0	0	0	0	0	0

Section 9: Natural Hazards

9.1 Maximum risk of natural ground subsidence	Moderate
9.1.1 Maximum Shrink-Swell hazard rating identified on the study site	Very Low
9.1.2 Maximum Landslides hazard rating identified on the study site	Very Low
9.1.3 Maximum Soluble Rocks hazard rating identified on the study site	Very Low
9.1.4 Maximum Compressible Ground hazard rating identified on the study site	Moderate
9.1.5 Maximum Collapsible Rocks hazard rating identified on the study site	Very Low
9.1.6 Maximum Running Sand hazard rating identified on the study site	Low
9.2 Radon	
9.2.1 Is the property in a Radon Affected Area as defined by the Health Protection Agency (HPA) and if so what percentage of homes are above the Action Level?	The site is not in a Radon Affected Area, as less than 1% of properties are above the Action Level.
9.2.2 Is the property in an area where Radon Protection are required for new properties or extensions to existing ones as described in publication BR211 by the Building Research Establishment?	No radon protective measures are necessary.

Section 10: Mining

10.1 Coal mining areas within 75m of the study site	None identified
10.2 Non-Coal Mining areas within 50m of the study site boundary	None identified
10.3 Brine affected areas within 75m of the study site	None identified

Using this report

The following report is designed by Environmental Consultants for Environmental Professionals bringing together the most up-to-date market leading environmental data. This report is provided under and subject to the Terms & Conditions agreed between Groundsure and the Client. The document contains the following sections:

1. Historical Industrial Sites

Provides information on past land uses that may pose a risk to the study site in terms of potential contamination from activities or processes. Potentially Infilled Land features are also included. This search is conducted using radii of up to 500m.

2. Environmental Permits, Incidents and Registers

Provides information on Regulated Industrial Activities and Pollution Incidents as recorded by Regulatory Authorities, and sites determined as Contaminated Land. This search is conducted using radii up to 500m.

3. Landfills and Other Waste Sites

Provides information on landfills and other waste sites that may pose a risk to the study site. This search is conducted using radii up to 1500m.

4. Current Land Uses

Provides information on current land uses that may pose a risk to the study site in terms of potential contamination from activities or processes. These searches are conducted using radii of up to 500m. This includes information on potentially contaminative industrial sites, petrol stations and fuel sites as well as high pressure gas pipelines and underground electricity transmission lines.

5. Geology

Provides information on artificial and superficial deposits and bedrock beneath the study site.

6. Hydrogeology and Hydrology

Provides information on productive strata within the bedrock and superficial geological layers, abstraction licenses, Source Protection Zones (SPZs) and river quality. These searches are conducted using radii of up to 2000m.

7. Flooding

Provides information on river and coastal flooding, flood defences, flood storage areas and groundwater flood areas. This search is conducted using radii of up to 250m.

8. Designated Environmentally Sensitive Sites

Provides information on the Sites of Special Scientific Interest (SSSI), National Nature Reserves (NNR), Special Areas of Conservation (SAC), Special Protection Areas (SPA), Ramsar sites, Local Nature Reserves (LNR), Areas of Outstanding Natural Beauty (AONB), National Parks (NP), Environmentally Sensitive Areas, Nitrate Sensitive Areas, Nitrate Vulnerable Zones and World Heritage Sites and Scheduled Ancient Woodland. These searches are conducted using radii of up to 2000m.

9. Natural Hazards

Provides information on a range of natural hazards that may pose a risk to the study site. These factors include natural ground subsidence and radon..

10. Mining

Provides information on areas of coal and non-coal mining and brine affected areas.

11. Contacts

This section of the report provides contact points for statutory bodies and data providers that may be able to provide further information on issues raised within this report. Alternatively, Groundsure provide a free Technical Helpline (08444 159000) for further information and guidance.

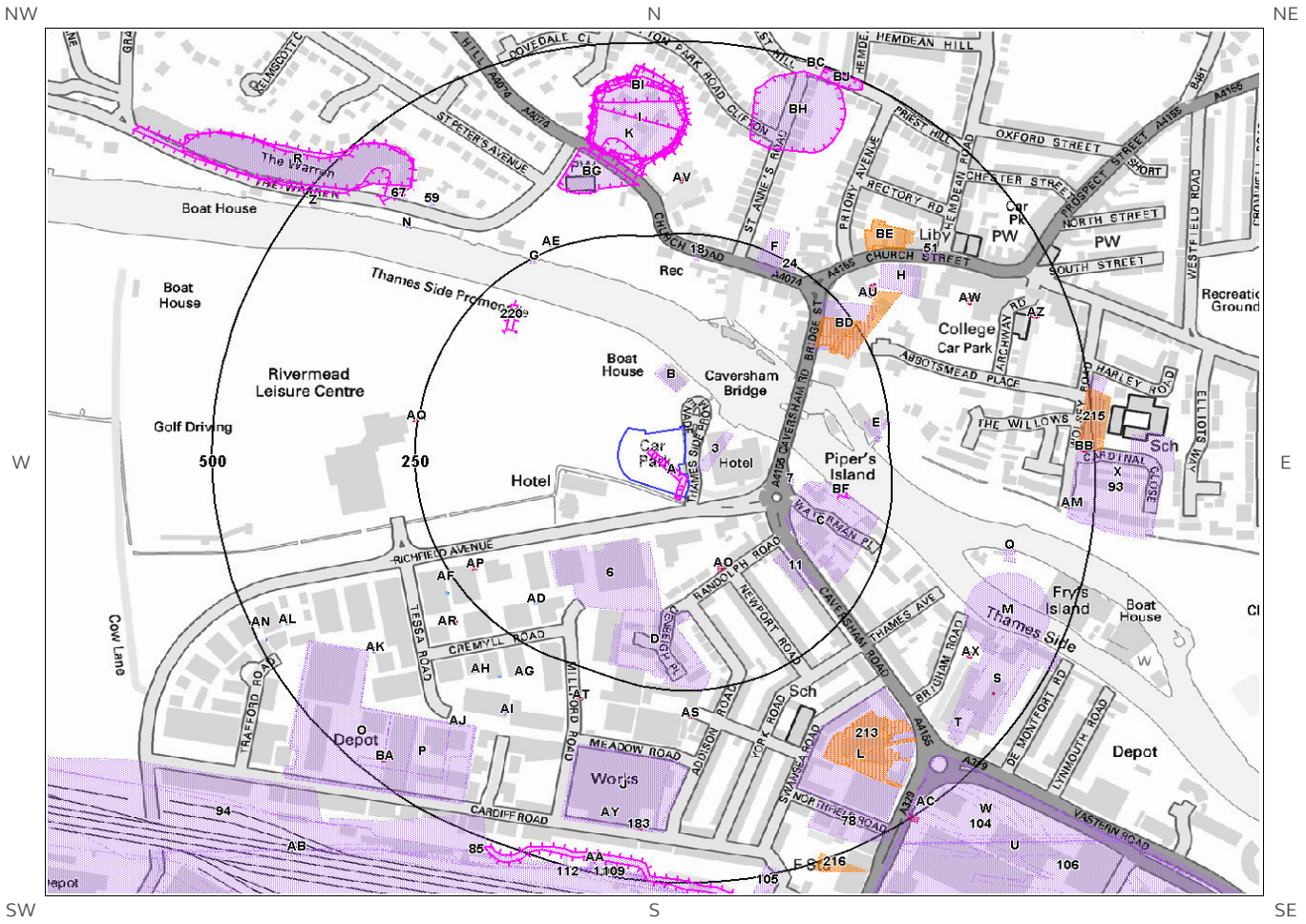
Note: Maps

Only certain features are placed on the maps within the report. All features represented on maps found within this search are given an identification number. This number identifies the feature on the mapping and correlates it to the additional information provided below. This identification number precedes all other information and takes the following format -Id: 1, Id: 2, etc. Where numerous features on the same map are in such close proximity that the numbers would obscure each other a letter identifier is used instead to represent the features. (e.g. Three features which overlap may be given the identifier “A” on the map and would be identified separately as features 1A, 3A, 10A on the data tables provided).

Where a feature is reported in the data tables to a distance greater than the map area, it is noted in the data table as “Not Shown”.

All distances given in this report are in Metres (m). Directions are given as compass headings such as N: North, E: East, NE: North East from the nearest point of the study site boundary.

1. Historical Land Use



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Site Outline

250
500
Search Buffers (m)

Historical 1:10,000 and 1:10,560 scale mapping

Industrial Land Use

Potentially Infilled Land

Historical 1:2,500, 1:1,250 and 1:500 scale mapping

Energy Features

Petrol Stations

Tanks

Garages

1. Historical Industrial Sites

1.1 Potentially Contaminative Uses identified from 1:10,000 scale Mapping

The systematic analysis of data extracted from standard 1:10,560 and 1:10,000 scale historical maps provides the following information:

Records of sites with a potentially contaminative past land use within 500m of the search boundary: 114

ID	Distance [m]	Direction	Use	Date
1A	0	On Site	Unspecified Ground Workings	1938
2A	0	On Site	Unspecified Ground Workings	1910
3	15	NE	Boat House	1977
4B	46	N	Boat House	1989
5B	46	N	Boat House	1994
6	68	S	Unspecified Depot	1977
7	120	E	Boat House	1910
8C	125	E	Unspecified Works	1971
9C	125	E	Unspecified Works	1977
10C	127	E	Unspecified Shed	1878
11	135	SE	Timber Yard	1878
12D	146	S	Unspecified Works	1971
13D	146	S	Unspecified Commercial/Industrial	1989
14D	146	S	Unspecified Works	1977
15D	148	S	Unspecified Works	1962
16BF	178	E	Unspecified Wharf	1878
17BD	188	NE	Unspecified Manufactory	1878
18	216	N	Boat Houses	1901
19E	219	E	Boat House	1910
20E	219	E	Boat House	1938
21F	226	NE	Police Station	1900
22F	226	NE	Police Station	1897
23E	232	E	Boat House	1878
24	239	NE	Smithy	1878
25G	242	NW	Boat House	1900
26G	243	NW	Boat House	1897
27H	300	NE	Telephone Exchange	1989
28H	300	NE	Telecomm Exchange	1994
29BG	308	N	Grave Yard	1878
30I	326	N	Unspecified Pit	1878
31I	330	N	Chalk Pit	1910
32I	330	N	Unspecified Pit	1938

33J	337	S	Printing Works	1910
34J	338	S	Printing Works	1938
35K	339	N	Cuttings	1989
36K	339	N	Cuttings	1977
37K	339	N	Cuttings	1962
38K	339	N	Cuttings	1971
39L	340	SE	Unspecified Works	1962
40L	340	SE	Unspecified Commercial/Industrial	1971
41L	340	SE	Unspecified Commercial/Industrial	1989
42L	340	SE	Unspecified Commercial/Industrial	1977
43L	340	SE	Unspecified Commercial/Industrial	1994
44J	340	S	Unspecified Works	1971
45J	340	S	Unspecified Works	1962
46J	340	S	Unspecified Works	1977
47J	340	S	Unspecified Works	1989
48J	340	S	Unspecified Works	1994
49I	349	N	Chalk Pit	1897
50I	349	N	Chalk Pit	1900
51	368	NE	Police Station	1901
52M	371	E	Boat House	1938
53M	371	E	Boat House	1910
54N	373	NW	Boat House	1910
55N	373	NW	Boat House	1938
56O	374	SW	Unspecified Depot	1977
57P	374	SW	Unspecified Depot	1971
58O	375	SW	Unspecified Depots	1989
59	375	NW	Boat Houses	1901
60BH	376	N	Chalk Pit	1901
61P	388	SW	Unspecified Depot	1977
62O	391	SW	Unspecified Depot	1994
63Q	397	E	Boat House	1938
64Q	397	E	Boat House	1910
65Q	397	E	Boat House	1897
66Q	399	E	Boat House	1900
67	407	NW	Boat Houses	1901
68R	411	NW	Unspecified Ground Workings	1910
69R	411	NW	Unspecified Ground Workings	1938
70S	413	SE	Sawmill	1938
71S	413	SE	Sawmill	1910
72R	414	NW	Unspecified Pits	1994
73R	414	NW	Unspecified Pits	1977
74R	414	NW	Unspecified Pits	1989

75R	414	NW	Unspecified Pits	1971
76R	414	NW	Unspecified Pits	1962
77BI	423	N	Unspecified Quarry	1961
78	426	SE	Malthouses	1878
79S	429	SE	Unspecified Warehouses	1977
80T	444	SE	Smithy	1897
81T	453	SE	Smithy	1900
82U	456	SE	Unspecified Works	1971
83U	456	SE	Unspecified Works	1962
84U	456	SE	Unspecified Works	1977
85	456	SE	Railway Sidings	1962
86V	456	SE	Railway Sidings	1977
87V	456	SE	Railway Sidings	1971
88W	457	SE	Railway Sidings	1938
89W	457	SE	Railway Sidings	1910
90W	458	SE	Railway Sidings	1897
91X	468	E	Unspecified Works	1971
92X	468	E	Unspecified Works	1962
93	468	E	Engineering Works	1938
94	473	S	Railway Sidings	1901
95Y	474	S	Unspecified Ground Workings	1938
96Y	474	S	Unspecified Ground Workings	1913
97AA	476	S	Railway Building	1933
98Z	481	NW	Boat Houses	1938
99Z	481	NW	Boat Houses	1910
100AA	482	S	Railway Buildings	1989
101AA	482	S	Railway Buildings	1994
102AA	482	S	Railway Buildings	1977
103BJ	482	NE	Cuttings	1878
104	483	SE	Railway Sidings	1900
105	486	S	Timber Yard	1913
106	490	S	Railway Sidings	1933
107AB	491	S	Railway Sidings	1994
108AB	491	S	Railway Sidings	1989
109	492	S	Railway Sidings	1913
110	492	S	Railway Sidings	1938
111AC	493	SE	Coal Depot	1938
112	494	S	Railway Sidings	1938
113AC	498	SE	Coal Depot	1910
114Y	500	S	Railway Buildings	1933

1.2 Additional Information – Historical Tank Database

The systematic analysis of data extracted from High Detailed 1:1,250 and 1:2,500 scale historical maps provides the following information.

Records of historical tanks within 500m of the search boundary: 30

ID	Distance (m)	Direction	Use	Date
115AD	196	SW	Unspecified Tank	1970
116AD	197	SW	Unspecified Tank	1988
117AE	254	N	Unspecified Tank	1936
118AE	254	N	Unspecified Tank	1932
119AF	258	SW	Unspecified Tank	1970
120AF	259	SW	Unspecified Tank	1988
121AF	265	SW	Unspecified Tank	1970
122AF	266	SW	Unspecified Tank	1988
123AG	284	SW	Unspecified Tank	1970
124AG	284	SW	Unspecified Tank	1988
125AR	291	SW	Unspecified Tank	1988
126AG	301	SW	Unspecified Tank	1970
127AG	302	SW	Unspecified Tank	1988
128AH	310	SW	Unspecified Tank	1970
129AH	311	SW	Unspecified Tank	1988
130AI	337	SW	Tanks	1970
131AI	337	SW	Tanks	1988
132AJ	379	SW	Tanks	1988
133AK	380	SW	Unspecified Tank	1970
134AJ	381	SW	Unspecified Tank	1970
135AK	381	SW	Unspecified Tank	1988
136AY	421	S	Unspecified Tank	1970
137AL	456	SW	Unspecified Tank	1988
138AL	457	SW	Unspecified Tank	1970
139AM	470	E	Unspecified Tank	1956
140AM	470	E	Unspecified Tank	1971
141AM	470	E	Unspecified Tank	1956
142AN	488	SW	Unspecified Tank	1972
143AN	489	SW	Unspecified Tank	1988
144AN	490	SW	Unspecified Tank	1970

1.3 Additional Information – Historical Energy Features Database

The systematic analysis of data extracted from High Detailed 1:1,250 and 1:2,500 scale historical maps provides the following information.

Records of historical energy features within 500m of the search boundary: 56

ID	Distance (m)	Direction	Use	Date
145AO	95	SE	Electricity Substation	1984
146AO	96	SE	Electricity Substation	1984
147AO	96	SE	Electricity Substation	1982
148AO	97	SE	Electricity Substation	1993
149AO	97	SE	Electricity Substation	1971
150AP	217	SW	Electricity Substation	1970
151AP	219	SW	Electricity Substation	1988
152AQ	250	W	Electricity Substation	1993
153AQ	251	W	Electricity Substation	1988
154AU	279	NE	Electricity Substation	1956
155AR	280	SW	Electricity Substation	1970
156AR	280	SW	Electricity Substation	1988
157AS	281	S	Electricity Substation	1971
158AS	281	S	Electricity Substation	1984
159AS	282	S	Electricity Substation	1982
160AS	282	S	Electricity Substation	1984
161AS	282	S	Electricity Substation	1993
162AT	286	S	Electricity Substation	1970
163AT	286	S	Electricity Substation	1988
164AU	291	NE	Electricity Substation	1982
165AU	291	NE	Electricity Substation	1956
166AU	291	NE	Electricity Substation	1971
167AU	292	NE	Electricity Substation	1971
168AV	315	N	Electricity Substation	1986
169AV	315	N	Electricity Substation	1982
170AV	315	N	Electricity Substation	1988
171AV	320	N	Electricity Substation	1982
172AK	376	SW	Electricity Substation	1986
173AW	383	NE	Electricity Substation	1971
174AW	383	NE	Electricity Substation	1993
175AW	383	NE	Electricity Substation	1984
176AW	383	NE	Electricity Substation	1982
177AX	402	SE	Electricity Substation	1971
178AX	402	SE	Electricity Substation	1984
179AX	402	SE	Electricity Substation	1988
180AX	403	SE	Electricity Substation	1970
181AX	403	SE	Electricity Substation	1986
182AY	428	S	Electricity Substation	1982
183	429	S	Electricity Substation	1956
184AZ	450	E	Electricity Substation	1956
185AZ	450	E	Electricity Substation	1971

186AZ	451	E	Electricity Substation	1970
187S	455	SE	Electricity Substation	1988
188S	455	SE	Electricity Substation	1956
189AZ	456	E	Electricity Substation	1956
190BA	471	SW	Electricity Substation	1999
191BA	471	SW	Electricity Substation	1997
192BB	484	E	Electricity Substation	1990
193BB	484	E	Electricity Substation	1993
194BB	485	E	Electricity Substation	1974
195BB	485	E	Electricity Substation	1984
196BB	485	E	Electricity Substation	1993
197BC	494	N	Electricity Substation	
198BC	494	N	Electricity Substation	
199AC	495	SE	Electricity Substation	
200AC	498	SE	Electricity Substation	

1.4 Additional Information – Historical Petrol and Fuel Site Database

The systematic analysis of data extracted from High Detailed 1:1,250 and 1:2,500 scale historical maps provides the following information.

Records of historical petrol stations and fuel sites within 500m of the search boundary: 0

Database searched and no data found.

1.5 Additional Information – Historical Garage and Motor Vehicle Repair Database

The systematic analysis of data extracted from High Detailed 1:1,250 and 1:2,500 scale historical maps provides the following information.

Records of historical garage and motor vehicle repair sites within 500m of the search boundary: 16

ID	Distance (m)	Direction	Use	Date
201BD	194	NE	Garage	1971
202BD	194	NE	Garage	1956
203BD	194	NE	Garage	1959
204BD	194	NE	Garage	1956
205BD	194	NE	Garage	1986
206BD	204	NE	Garage	1982
207BE	320	NE	Garage	1982
208BE	321	NE	Garage	1971
209BE	323	NE	Garage	1956
210BE	323	NE	Garage	1959
211BE	323	NE	Garage	1956

212L	358	SE	Coach Building Motor Car Engineering Works	1971
213	358	SE	Coach Building and Engineering Works	1956
214L	359	SE	Coach Building Engineering Works	1956
215	481	E	Garage	1975
216	490	S	Car Depot	1971

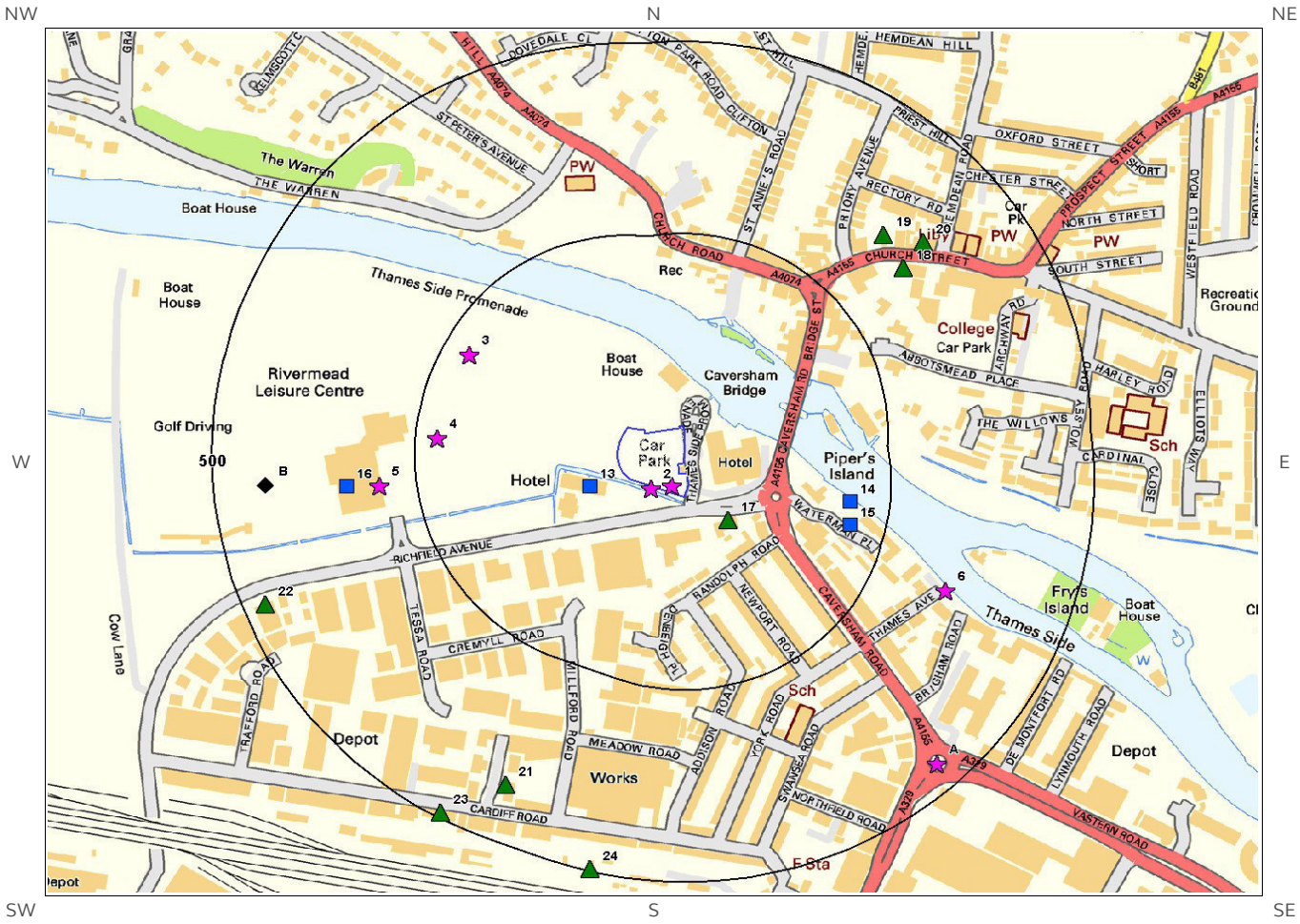
1.6 Potentially Infilled Land

Records of Potentially Infilled Features from 1:10,000 scale mapping within 500m of the study site: 26

The following Historical Potentially Infilled Features derived from the Historical Mapping information is provided by Groundsure:

ID	Distance(m)	Direction	Use	Date
217A	0	On Site	Unspecified Ground Workings	1938
218A	0	On Site	Unspecified Ground Workings	1910
219BF	178	E	Unspecified Wharf	1878
220	190	NW	Pond	1971
221BG	308	N	Grave Yard	1878
222I	326	N	Unspecified Pit	1878
223I	330	N	Unspecified Pit	1938
224I	330	N	Chalk Pit	1910
225K	339	N	Cuttings	1977
226K	339	N	Cuttings	1971
227K	339	N	Cuttings	1962
228K	339	N	Cuttings	1989
229I	349	N	Chalk Pit	1897
230I	349	N	Chalk Pit	1900
231BH	376	N	Chalk Pit	1901
232R	411	NW	Unspecified Ground Workings	1938
233R	411	NW	Unspecified Ground Workings	1910
234R	414	NW	Unspecified Pits	1971
235R	414	NW	Unspecified Pits	1962
236R	414	NW	Unspecified Pits	1989
237R	414	NW	Unspecified Pits	1994
238R	414	NW	Unspecified Pits	1977
239BI	423	N	Unspecified Quarry	1961
240Y	474	S	Unspecified Ground Workings	1913
241Y	474	S	Unspecified Ground Workings	1938
242BJ	482	NE	Cuttings	1878

2. Environmental Permits, Incidents and Registers Map



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Site Outline

250
500
Search Buffers (m)

Recorded Pollution Incident

Dangerous Substances (List 1)

Dangerous Substances (List 2)

Water Industry Referrals

Licenced Discharge Consents

Red List Discharge Consents

RAS 3 & 4 Authorisations

Part A(1) Authorised Processes and Historic IPC Authorisations

Part A(2) and Part B Authorised Processes

COMAH / NIHHS Sites

Sites Determined as Contaminated Land

Hazardous Substance Consents and Enforcements

2. Environmental Permits, Incidents and Registers

2.1 Industrial Sites Holding Licences and/or Authorisations

Searches of information provided by the Environment Agency/Natural Resources Wales and Local Authorities reveal the following information:

2.1.1 Records of historic IPC Authorisations within 500m of the study site:

0

Database searched and no data found.

2.1.2 Records of Part A(1) and IPPC Authorised Activities within 500m of the study site:

0

Database searched and no data found.

2.1.3 Records of Red List Discharge Consents (potentially harmful discharges to controlled waters) within 500m of the study site:

0

Database searched and no data found.

2.1.4 Records of List 1 Dangerous Substances Inventory Sites within 500m of the study site:

4

The following List 1 Dangerous Substance Inventory Site records are represented as points on the Environmental Permits, Incidents and Registers Map:

ID	Distance (m)	Direction	NGR	Details	
9B	436	W	470500 174500	Name: Quick Circuits, Lovelock Road, Reading Status: Active Receiving Water: Kennet	Authorised Substances: Mercury (other)
10B	436	W	470500 174500	Name: Hilliers Engineering, 215 Cardiff Road, Reading Status: Active Receiving Water: Kennet	Authorised Substances: Mercury (other), Cadmium
11B	436	W	470500 174500	Name: Quick Circuits Lovelock Rd. Reading Status: Not Active Receiving Water: -	Authorised Substances: -

ID	Distance (m)	Direction	NGR	Details	
12B	436	W	470500 174500	Name: Hilliers Engineering 215 Cardiff Road Reading Status: Not Active Receiving Water: -	Authorised Substances: -

2.1.5 Records of List 2 Dangerous Substance Inventory Sites within 500m of the study site:

0

Database searched and no data found.

2.1.6 Records of Part A(2) and Part B Activities and Enforcements within 500m of the study site:

8

The following Part A(2) and Part B Activities are represented as points on the Environmental Permits, Incidents and Registers Map:

ID	Distance (m)	Direction	NGR	Details	
17	62	SE	471070 174454	Address: Snax 24 Limited, Richfield Avenue, Reading, Berkshire, RG1 8EQ Process: Unloading of Petrol into Storage at Service Stations Status: Current Permit Permit Type: Part B	Enforcement: No Enforcements Notified Date of Enforcement: No Enforcements Notified Comment: No Enforcements Notified
18	339	NE	471286 174781	Address: Caversham Launderama, 21 Church St, Caversham, Reading, RG4 8AZ Process: Dry Cleaning Status: Historical Permit Permit Type: Part B	Enforcement: No Enforcements Notified Date of Enforcement: No Enforcements Notified Comment: No Enforcements Notified
19	348	NE	471261 174824	Address: Tesco Stores Ltd, Caversham Bridge Service Station, 18-20 Church Street, Caversham, Reading, RG4 8AU Process: Unloading of Petrol into Storage at Service Stations Status: Current Permit Permit Type: Part B	Enforcement: No Enforcements Notified Date of Enforcement: No Enforcements Notified Comment: No Enforcements Notified
20	379	NE	471310 174815	Address: Suprema Dry Cleaners, 32B Church Street, Caversham, Reading, RG4 8AU Process: Dry Cleaning Status: Current Permit Permit Type: Part B	Enforcement: No Enforcements Notified Date of Enforcement: No Enforcements Notified Comment: No Enforcements Notified
21	429	S	470796 174109	Address: Rivermead Accident Repair Centre Limited, 64 Cardiff Road, Reading, Berkshire, RG1 8LL Process: Respraying of Road Vehicles Status: Current Permit Permit Type: Part B	Enforcement: No Enforcements Notified Date of Enforcement: No Enforcements Notified Comment: No Enforcements Notified

ID	Distance (m)	Direction	NGR	Details	
22	474	SW	470499 174344	Address: Grosvenor Motor Company Ltd, 10 Richfield Avenue, Reading, RG1 8EQ Process: Waste Oil and Recovered Oil less than 0.4MW Status: New Legislation Applies Permit Type: Part B	Enforcement: No Enforcements Notified Date of Enforcement: No Enforcements Notified Comment: No Enforcements Notified
23	495	SW	470715 174073	Address: Sprayworks Limited, Unit 5, 151-155 Cardiff Road, Reading, RG1 8ES Process: Respraying of Road Vehicles Status: Historical Permit Permit Type: Part B	Enforcement: No Enforcements Notified Date of Enforcement: No Enforcements Notified Comment: No Enforcements Notified
24	499	S	470900 174000	Address: Scenery Salvage, Cardiff Road, Reading, Berkshire, RG1 8ES Process: Combustion of Waste Wood Status: Current Permit Permit Type: Part B	Enforcement: No Enforcements Notified Date of Enforcement: No Enforcements Notified Comment: No Enforcements Notified

2.1.7 Records of Category 3 or 4 Radioactive Substances Authorisations:

0

Database searched and no data found.

2.1.8 Records of Licensed Discharge Consents within 500m of the study site:

4

The following Licensed Discharge Consents records are represented as points on the Environmental Permits, Incidents and Registers Map:

ID	Distance (m)	Direction	NGR	Details	
13	44	SW	470900 174500	Address: CALENDARS RESTAURANT, RICHFIELD AVE, CALENDARS RESTAURANT, RICHFIELD, AVENUE, CAVERSHAM, READING, BERK, S, - Effluent Type: MISCELLANEOUS DISCHARGES - SURFACE WATER Permit Number: CTWC.2379 Permit Version: 1	Receiving Water: PORTMAN BROOK Status: TRANSFERRED FROM COPA 1974 Issue date: 22/04/1988 Effective Date: 22-Apr-1988 Revocation Date: -
14	200	E	471220 174480	Address: OFFICES, CAVERSHAM ROAD, READING, B, OFFICES, CAVERSHAM ROAD, READING, , BERKS, -, - Effluent Type: MISCELLANEOUS DISCHARGES - SURFACE WATER Permit Number: CTWC.2078 Permit Version: 1	Receiving Water: RIVER THAMES Status: REVOKED - UNSPECIFIED Issue date: 02/12/1987 Effective Date: 02-Dec-1987 Revocation Date: 06/02/1995
15	205	E	471220 174450	Address: RETIREMENT HOMES DEVELOPMENT, CAVER, RETIREMENT HOMES DEVELOPMENT, CA, VERSHAM ROAD, READING, BERKS, -, - Effluent Type: MISCELLANEOUS DISCHARGES - SURFACE WATER Permit Number: CTWC.2313 Permit Version: 1	Receiving Water: RIVER THAMES Status: REVOKED - UNSPECIFIED Issue date: 25/03/1988 Effective Date: 25-Mar-1988 Revocation Date: 31/10/1991

ID	Distance (m)	Direction	NGR	Details	
16	336	W	470600 174500	Address: RIVERSIDE LEISURE CENTRE, READING,, RIVERSIDE LEISURE CENTRE, READIN, G, BERKS, -, - Effluent Type: MISCELLANEOUS DISCHARGES - SURFACE WATER Permit Number: CTWC.2509 Permit Version: 1	Receiving Water: PORTMAN BROOK Status: TRANSFERRED FROM COPA 1974 Issue date: 09/06/1988 Effective Date: 09-Jun-1988 Revocation Date: -

2.1.9 Records of Water Industry Referrals (potentially harmful discharges to the public sewer) within 500m of the study site:

0

Database searched and no data found.

2.1.10 Records of Planning Hazardous Substance Consents and Enforcements within 500m of the study site:

0

Database searched and no data found.

2.2 Dangerous or Hazardous Sites

Records of COMAH & NIHHS sites within 500m of the study site: 0

Database searched and no data found.

2.3 Environment Agency/Natural Resources Wales Recorded Pollution Incidents

2.3.1 Records of National Incidents Recording System, List 2 within 500m of the study site:

8

The following NIRS List 2 records are represented as points on the Environmental Permits, Incidents and Registers Map:

ID	Distance (m)	Direction	NGR	Details	
1	0	On Site	471000 174500	Incident Date: 10-Jul-2001 Incident Identification: 15233 Pollutant: Organic Chemicals/Products Pollutant Description: Other Organic Chemical or Product	Water Impact: Category 4 (No Impact) Land Impact: Category 4 (No Impact) Air Impact: Category 4 (No Impact)
2	3	S	470974 174497	Incident Date: 13-Aug-2002 Incident Identification: 99851 Pollutant: Oils and Fuel Pollutant Description: Other Oil or Fuel	Water Impact: Category 3 (Minor) Land Impact: Category 3 (Minor) Air Impact: Category 4 (No Impact)

ID	Distance (m)	Direction	NGR	Details	
3	217	NW	470750 174670	Incident Date: 30-Nov-2001 Incident Identification: 45823 Pollutant: Inert Materials and Wastes Pollutant Description: Mineral Materials and Wastes	Water Impact: Category 4 (No Impact) Land Impact: Category 4 (No Impact) Air Impact: Category 4 (No Impact)
4	224	W	470711 174562	Incident Date: 27-Feb-2002 Incident Identification: 60853 Pollutant: Oils and Fuel Pollutant Description: Mixed/Waste Oils	Water Impact: Category 4 (No Impact) Land Impact: Category 3 (Minor) Air Impact: Category 4 (No Impact)
5	297	W	470640 174500	Incident Date: 26-Feb-2002 Incident Identification: 60718 Pollutant: Oils and Fuel Pollutant Description: Unidentified Oil	Water Impact: Category 4 (No Impact) Land Impact: Category 3 (Minor) Air Impact: Category 4 (No Impact)
6	342	E	471337 174364	Incident Date: 22-Aug-2001 Incident Identification: 25897 Pollutant: General Biodegradable Materials and Wastes Pollutant Description: Food and Drink	Water Impact: Category 4 (No Impact) Land Impact: Category 4 (No Impact) Air Impact: Category 4 (No Impact)
7A	466	SE	471327 174138	Incident Date: 17-Sep-2002 Incident Identification: 108560 Pollutant: Oils and Fuel Pollutant Description: Diesel	Water Impact: Category 4 (No Impact) Land Impact: Category 4 (No Impact) Air Impact: Category 4 (No Impact)
8A	466	SE	471327 174138	Incident Date: 17-Sep-2002 Incident Identification: 108560 Pollutant: Oils and Fuel Pollutant Description: Diesel	Water Impact: Category 4 (No Impact) Land Impact: Category 4 (No Impact) Air Impact: Category 4 (No Impact)

2.3.2 Records of National Incidents Recording System, List 1 within 500m of the study site:

0

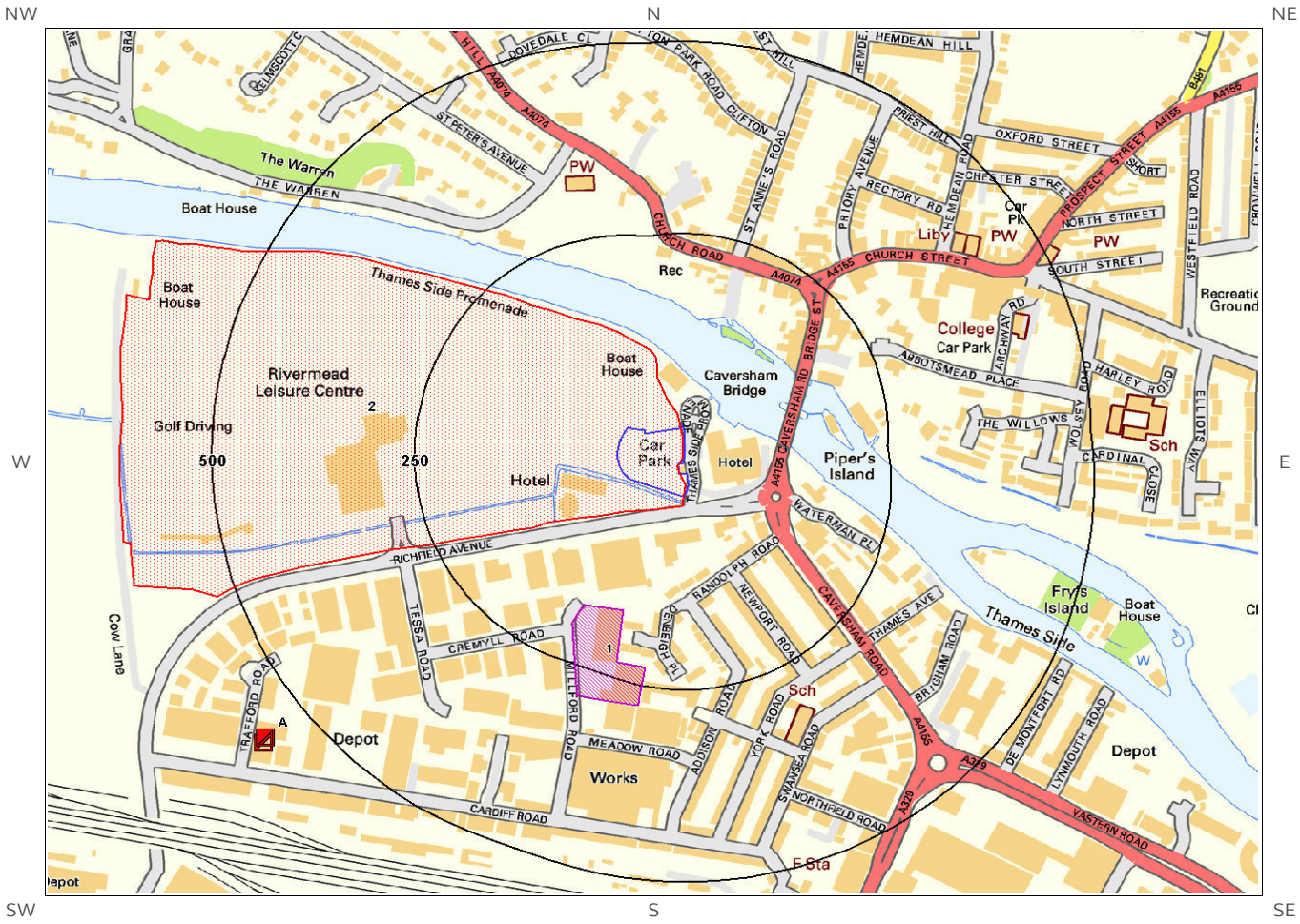
Database searched and no data found.

2.4 Sites Determined as Contaminated Land under Part 2A EPA 1990

Records of sites determined as contaminated land under Section 78R of the Environmental Protection Act 1990 are there within 500m of the study site 0

Database searched and no data found.

3. Landfill and Other Waste Sites Map



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Site Outline

250
500
Search Buffers (m)

EA/NRW Active Landfill

EA/NRW Historic Landfill

BGS / DoE Survey Landfill

Historic and Planned Waste Sites

EA/NRW Licensed Waste Site

Local Authority/Historical Mapping Landfill Records

3. Landfill and Other Waste Sites

3.1 Landfill Sites

3.1.1 Records from Environment Agency/Natural Resources Wales landfill data within 1000m of the study site:

0

Database searched and no data found.

3.1.2 Records of Environment Agency/Natural Resources Wales historic landfill sites within 1500m of the study site:

2

The following landfill records are represented as either points or polygons on the Landfill and Other Waste Sites map:

ID	Distance (m)	Direction	NGR	Details	
2	0	On Site	470600 174500	Site Address: Richfield Avenue, Reading, Berkshire Waste Licence: - Site Reference: RDG11, TP0122 Waste Type: Commercial, Household, Liquid sludge Environmental Permitting Regulations (Waste) Reference: -	Licence Issue: Licence Surrendered: Licence Holder Address: - Operator: - Licence Holder: - First Recorded: 31-Dec-1970 Last Recorded: 31-Dec-1979
Not shown	850	SW	470200 173900	Site Address: Cow Lane, Reading, Berkshire Waste Licence: - Site Reference: TP0340, RDG4 Waste Type: Inert Environmental Permitting Regulations (Waste) Reference: -	Licence Issue: Licence Surrendered: Licence Holder Address: - Operator: - Licence Holder: - First Recorded: 31-Dec-1950 Last Recorded: 31-Dec-1959

3.1.3 Records of BGS/DoE non-operational landfill sites within 1500m of the study site:

0

Database searched and no data found.

3.1.4 Records of Landfills from Local Authority and Historical Mapping Records within 1500m of the study site:

0

Database searched and no data found.

3.2 Other Waste Sites

3.2.1 Records of waste treatment, transfer or disposal sites within 500m of the study site:

1

The following waste treatment, transfer or disposal sites records are represented as points on the Landfill and Other Waste Sites map:

ID	Distance (m)	Direction	NGR	Details		
1	163	S	470923 174279	Type of Site: Scrap Metal Yard Site Address: N/A	Planning Application Reference: N/A Date: 1969	Further Details: N/A Data Source: Historic Mapping Data Type: Polygon

3.2.2 Records of Environment Agency/Natural Resources Wales licensed waste sites within 1500m of the study site:

9

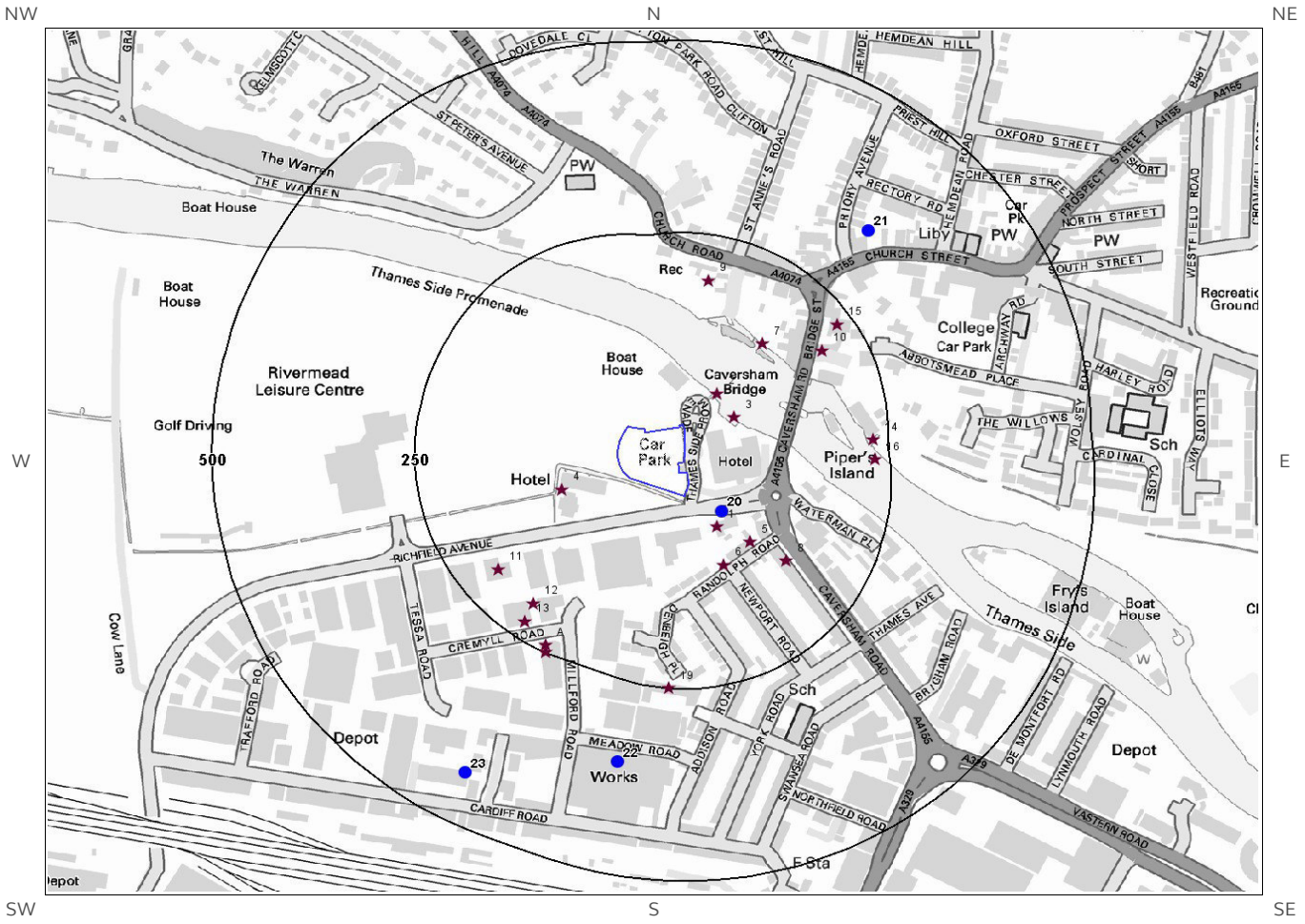
The following waste treatment, transfer or disposal sites records are represented as points on the Landfill and Other Waste Sites map:

ID	Distance (m)	Direction	NGR	Details	
4A	559	SW	470500 174174	Site Address: 128, Cardiff Road, Reading, Berkshire, RG1 8PQ Type: 75kte HCI Waste TS + treatment Size: < 25000 tonnes Environmental Permitting Regulations (Waste) Licence Number: MCO003 EPR reference: EA/EPR/EP3893VZ/V002 Operator: M Collard Waste Management Services Ltd Waste Management licence No: 101199 Annual Tonnage: 74999.0	Issue Date: 11/02/2010 Effective Date: - Modified: 09/07/2010 Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Modified Site Name: M Collard Waste Management Services Ltd Correspondence Address: -
5A	559	SW	470500 174174	Site Address: 128, Cardiff Road, Reading, Berkshire, RG1 8PQ Type: 75kte HCI Waste TS + treatment Size: < 25000 tonnes Environmental Permitting Regulations (Waste) Licence Number: RCO001 EPR reference: EA/EPR/EB3500KB/T001 Operator: R Collard Limited Waste Management licence No: 101199 Annual Tonnage: 74999.0	Issue Date: 11/02/2010 Effective Date: 11/10/2016 Modified: 09/07/2010 Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Transferred Site Name: R Collard Limited Correspondence Address: -

ID	Distance (m)	Direction	NGR	Details	
6A	566	SW	470497 174166	Site Address: 128, Cardiff Road, Reading, Berkshire, RG1 8PQ Type: 75kte Materials Recycling Facility Size: < 25000 tonnes Environmental Permitting Regulations (Waste) Licence Number: MCO003 EPR reference: EP3893VZ/A001 Operator: M Collard Waste Management Services Ltd Waste Management licence No: 101199 Annual Tonnage: 0.0	Issue Date: 11/02/2010 Effective Date: - Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Issued Site Name: M Collard Waste Management Services Ltd Correspondence Address: -
Not shown	1031	SW	470200 173800	Site Address: Elliot Metal Company Ltd, 3, Loverock Road, Battle Farm Indus Est, Reading, RG3 1NL Type: Metal Recycling Site (mixed MRS's) Size: < 25000 tonnes Environmental Permitting Regulations (Waste) Licence Number: SIM001 EPR reference: - Operator: Simsmetal Uk Limited Waste Management licence No: 86002 Annual Tonnage: 4999.0	Issue Date: 06/04/1993 Effective Date: 27/04/2002 Modified: 26/04/2002 Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Modified Site Name: Simsmetal U K Limited Correspondence Address: 4, The Uplands, Nailsea, Somerset, BS48 4RR
Not shown	1031	SW	470200 173800	Site Address: Elliot Metal Company Ltd, 3, Loverock Road, Battle Farm Indus Est, Reading, Berkshire, RG3 1NL Type: Metal Recycling Site (mixed MRS's) Size: < 25000 tonnes Environmental Permitting Regulations (Waste) Licence Number: PAR197 EPR reference: EA/EPR/CB3909KB/S002 Operator: Parsons Metal Recycling Limited Waste Management licence No: 86002 Annual Tonnage: 0.0	Issue Date: 06/04/1993 Effective Date: 26/06/2015 Modified: 27/08/2014 Surrendered Date: 08/03/2016 Expiry Date: - Cancelled Date: - Status: Surrendered Site Name: Parsons Metal Recycling Limited Correspondence Address: -
Not shown	1031	SW	470200 173800	Site Address: Elliot Metal Company Ltd, 3, Loverock Road, Battle Farm Indus Est, Reading, Berkshire, RG3 1NL Type: Metal Recycling Site (mixed MRS's) Size: < 25000 tonnes Environmental Permitting Regulations (Waste) Licence Number: SIM001 EPR reference: EA/EPR/LP3199EB/V006 Operator: Sims Group U K Ltd Waste Management licence No: 86002 Annual Tonnage: 74999.0	Issue Date: 06/04/1993 Effective Date: 27/04/2002 Modified: 27/08/2014 Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Modified Site Name: Sims Group U K Ltd Correspondence Address: -
Not shown	1031	SW	470200 173800	Site Address: Elliot Metal Company Ltd, 3, Loverock Road, Battle Farm Indus Est, Reading, Berkshire, RG3 1NL Type: Metal Recycling Site (mixed MRS's) Size: < 25000 tonnes Environmental Permitting Regulations (Waste) Licence Number: SIM001 EPR reference: EA/EPR/LP3199EB/V005 Operator: Sims Group Uk Limited Waste Management licence No: 86002 Annual Tonnage: 74999.0	Issue Date: 06/04/1993 Effective Date: 27/04/2002 Modified: 20/04/2010 Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Modified Site Name: Sims Group U K Ltd Correspondence Address: -
Not shown	1062	SW	470400 173600	Site Address: E.G.W Carter, 54, Gower Street, Reading, Berkshire, RG1 7PE Type: Metal Recycling Site (mixed MRS's) Size: < 25000 tonnes Environmental Permitting Regulations (Waste) Licence Number: CAR001 EPR reference: EA/EPR/LP3699EF/S004 Operator: E G W Carter Waste Management licence No: 86001 Annual Tonnage: 9322.0	Issue Date: 19/03/1996 Effective Date: - Modified: - Surrendered Date: 23/07/1999 Expiry Date: - Cancelled Date: - Status: Surrendered Site Name: E G W Carter Correspondence Address: -

ID	Distance (m)	Direction	NGR	Details	
Not shown	1292	W	469718 174096	Site Address: Part A, Unit B, 75, Loverock Road, Tilehurst, Reading, Berkshire, RG30 1DZ Type: 75kte HCI Waste TS + treatment Size: < 25000 tonnes Environmental Permitting Regulations (Waste) Licence Number: OAK056 EPR reference: EA/EPR/EP3993VE/A001 Operator: Oakford U K Ltd Waste Management licence No: 101222 Annual Tonnage: 74999.0	Issue Date: 18/11/2009 Effective Date: - Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Expired Site Name: Loverock Road Waste Transfer Station Correspondence Address: -

4. Current Land Use Map



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Site Outline

250
500
Search Buffers (m)

Current Industrial Sites

Petrol & Fuel Sites

Electricity Transmission Cables

Gas Transmission Pipelines

4. Current Land Uses

4.1 Current Industrial Data

Records of potentially contaminative industrial sites within 250m of the study site: 19

The following records are represented as points on the Current Land Uses map.

ID	Distance (m)	Direction	Company	NGR	Address	Activity	Category
1	55	SE	Snax 24 Reading	471056 174447	Richfield Avenue, Reading, RG1 8EQ	Petrol and Fuel Stations	Road and Rail
2	59	NE	Slipway	471056 174620	RG1	Moorings and Unloading Facilities	Water
3	62	E	Landing Stage	471077 174589	RG1	Moorings and Unloading Facilities	Water
4	78	SW	Electricity Sub Station	470865 174495	RG1	Electrical Features	Infrastructure and Facilities
5	99	SE	The Sign Shop	471097 174427	2a, Randolph Road, Reading, RG1 8EB	Signs	Industrial Products
6	100	SE	Electricity Sub Station	471064 174397	RG1	Electrical Features	Infrastructure and Facilities
7	145	NE	Landing Stage	471112 174685	RG1	Moorings and Unloading Facilities	Water
8	150	SE	Caversham Bridge Motor Cycles	471141 174402	209, Caversham Road, Reading, RG1 8BB	New Vehicles	Motoring
9	192	N	Past Time Bus	471045 174767	3, Buckside, Caversham, Reading, RG4 7AH	Vehicle Hire and Rental	Hire Services
10	196	NE	Tyre City	471185 174676	3-5, Bridge Street, Caversham, Reading, RG4 8AA	Vehicle Parts and Accessories	Motoring
11	199	SW	Delta Air Conditioning	470786 174391	20-22, Richfield Avenue, Reading, RG1 8EQ	Construction Completion Services	Construction Services
12	202	SW	Tank	470830 174347	RG1	Tanks (Generic)	Industrial Features
13	227	SW	Reading Extinguisher Services	470819 174324	14, Cremyll Road, Reading, RG1 8NQ	Special Purpose Machinery and Equipment	Industrial Products
14	231	E	Slipway	471248 174560	RG4	Moorings and Unloading Facilities	Water
15	231	NE	Tyre City	471204 174710	5, Bridge Street, Reading, RG4 8AA	Vehicle Repair, Testing and Servicing	Repair and Servicing
16	231	E	Landing Stage	471251 174534	RG4	Moorings and Unloading Facilities	Water
17A	241	SW	Twofold Ltd	470844 174292	77, Milford Road, Reading, RG1 8LG	Office and Shop Equipment	Industrial Products
18A	249	SW	Complete Connections	470845 174283	Unit 75, Milford Road, Reading, RG1 8LG	Electronic Equipment	Industrial Products

ID	Distance (m)	Direction	Company	NGR	Address	Activity	Category
19	249	S	Depot	470997 174237	RG1	Container and Storage	Transport, Storage and Delivery

4.2 Petrol and Fuel Sites

Records of petrol or fuel sites within 500m of the study site: 4

The following petrol or fuel site records provided by Catalist are represented as points on the Current Land Use map:

ID	Distance (m)	Direction	NGR	Company	Address	LPG	Status
20	49	SE	471062 174466	BP	Rss Reading, Richfield Avenue, Richfield Avenue, Reading, Reading, RG1 8EQ	No	Open
21	340	NE	471242 174831	Esso	Caversham Express, 18-20, Church Street, Church Street, Caversham, Reading, Reading, RG4 8AU	No	Open
22	355	S	470934 174140	Obsolete	Brs Southern, Cardiff Road, Cardiff Road, Reading, Reading, RG1 8HW	Not Applicable	Obsolete
23	434	SW	470746 174126	Obsolete	Cardiff Road Service Station, 165-7, Cardiff Road, Cardiff Road, Reading, Reading, RG1 8HY	Not Applicable	Obsolete

4.3 National Grid High Voltage Underground Electricity Transmission Cables

This dataset identifies the high voltage electricity transmission lines running between generating power plants and electricity substations. The dataset does not include the electricity distribution network (smaller, lower voltage cables distributing power from substations to the local user network). This information has been extracted from databases held by National Grid and is provided for information only with no guarantee as to its completeness or accuracy. National Grid do not offer any warranty as to the accuracy of the available data and are excluded from any liability for any such inaccuracies or errors.

Records of National Grid high voltage underground electricity transmission cables within 500m of the study site: 0

Database searched and no data found.

4.4 National Grid High Pressure Gas Transmission Pipelines

This dataset identifies high-pressure, large diameter pipelines which carry gas between gas terminals, power stations, compressors and storage facilities. The dataset does not include the Local Transmission System (LTS) which supplies gas directly into homes and businesses. This information has been extracted from databases held by National Grid and is provided for information only with no guarantee as to its completeness or accuracy. National Grid do not offer any warranty as to the accuracy of the available data and are excluded from any liability for any such inaccuracies or errors.

Records of National Grid high pressure gas transmission pipelines within 500m of the study site: 0

Database searched and no data found.

5. Geology

5.1 Artificial Ground and Made Ground

Database searched and no data found.

The database has been searched on site, including a 50m buffer.

5.2 Superficial Ground and Drift Geology

The database has been searched on site, including a 50m buffer.

Lex Code	Description	Rock Type
LASI-XCZ	LANGLEY SILT MEMBER	CLAY AND SILT
ALV-XCZSV	ALLUVIUM	CLAY, SILT, SAND AND GRAVEL

5.3 Bedrock and Solid Geology

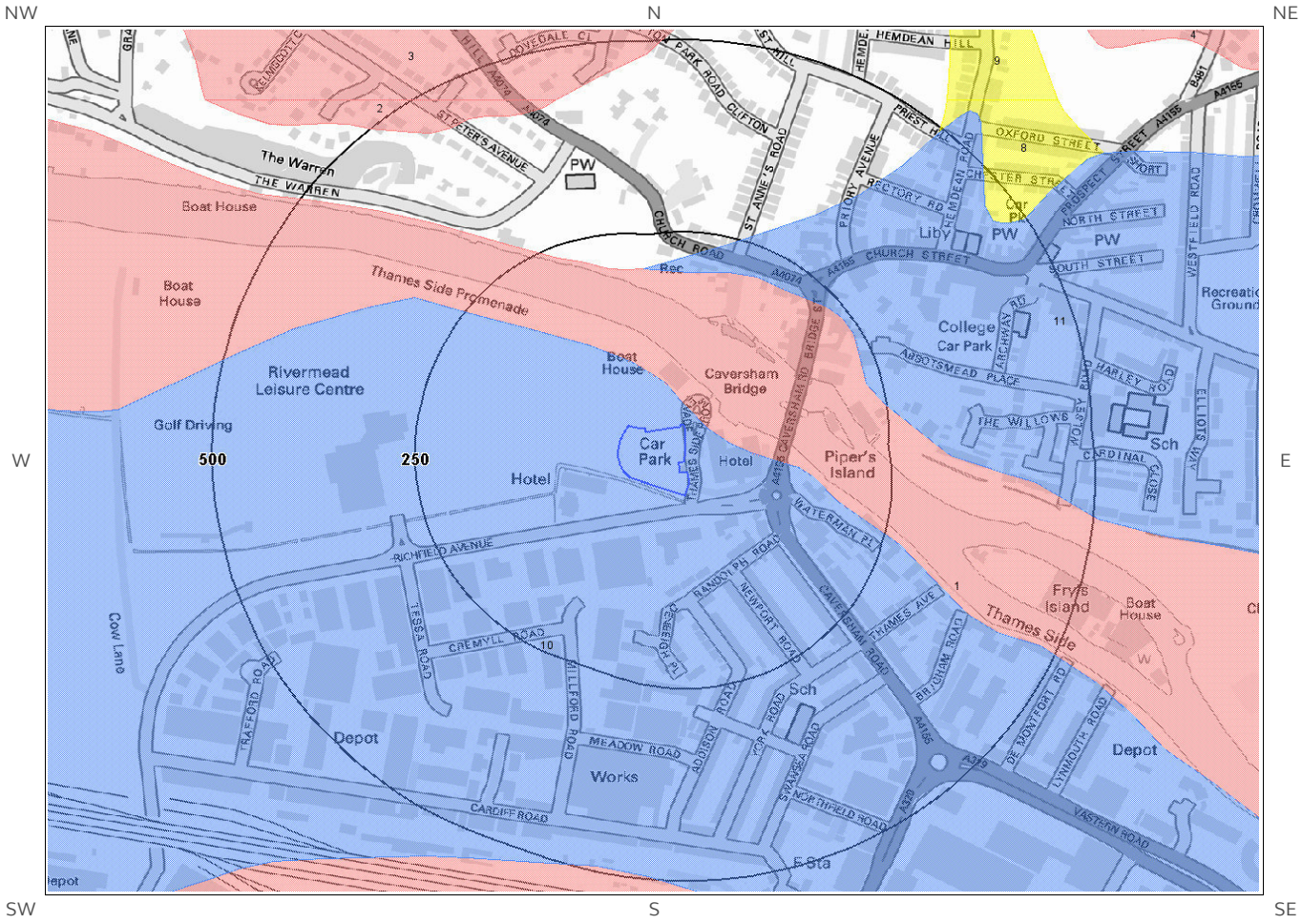
The database has been searched on site, including a 50m buffer.

Lex Code	Description	Rock Type
SNCK-CHLK	SEAFORD CHALK FORMATION AND NEWHAVEN CHALK FORMATION (UNDIFFERENTIATED)	CHALK

(Derived from the BGS 1:50,000 Digital Geological Map of Great Britain)

6 Hydrogeology and Hydrology

6a. Aquifer Within Superficial Geology



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Site Outline

250 — 500 — Search Buffers (m)

Principal Aquifer

Secondary (A) Aquifer - Permeable Layers

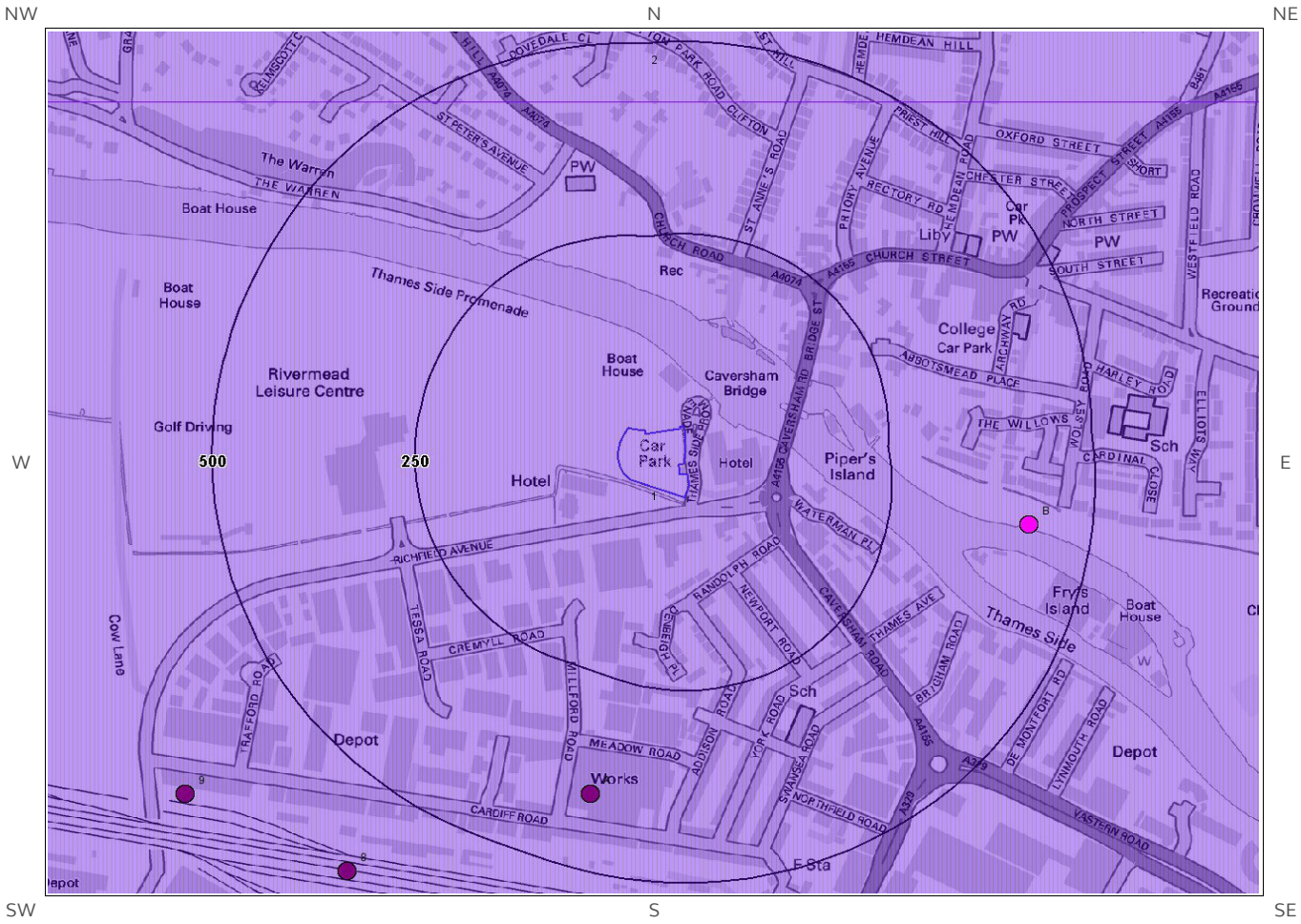
Secondary (B) Aquifer - Lower Permeability Layers

Secondary Aquifer - Undifferentiated Layers

Unproductive

Unknown (lakes and landslip)

6b. Aquifer Within Bedrock Geology and Abstraction Licenses



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Site Outline

250 — 500 Search Buffers (m)

Principal Aquifer

Secondary (A) Aquifer - Permeable Layers

Secondary (B) Aquifer - Lower Permeability Layers

Groundwater Abstraction Licence

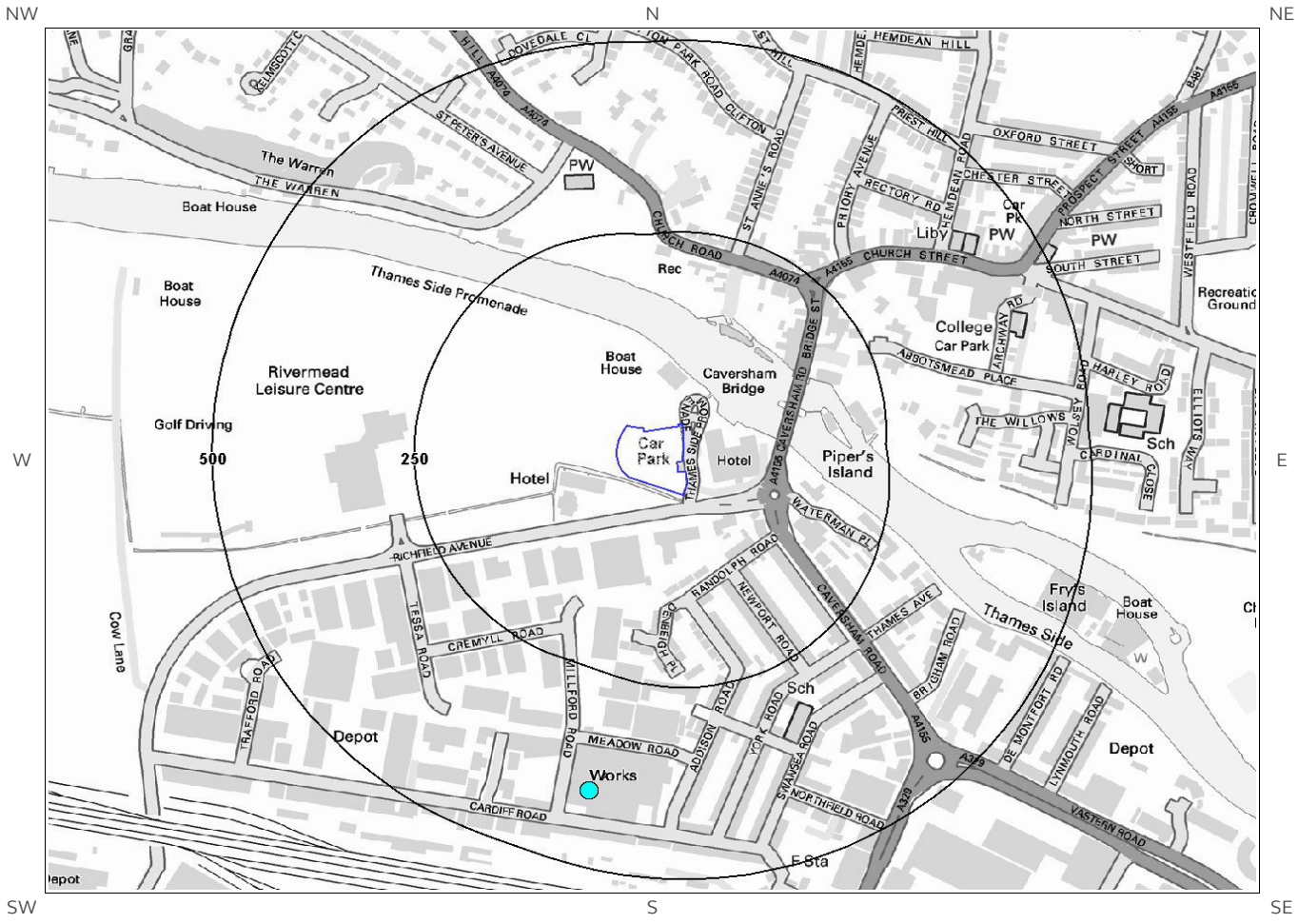
Secondary Aquifer - Undifferentiated Layers

Unproductive

Unknown (lakes and landslip)

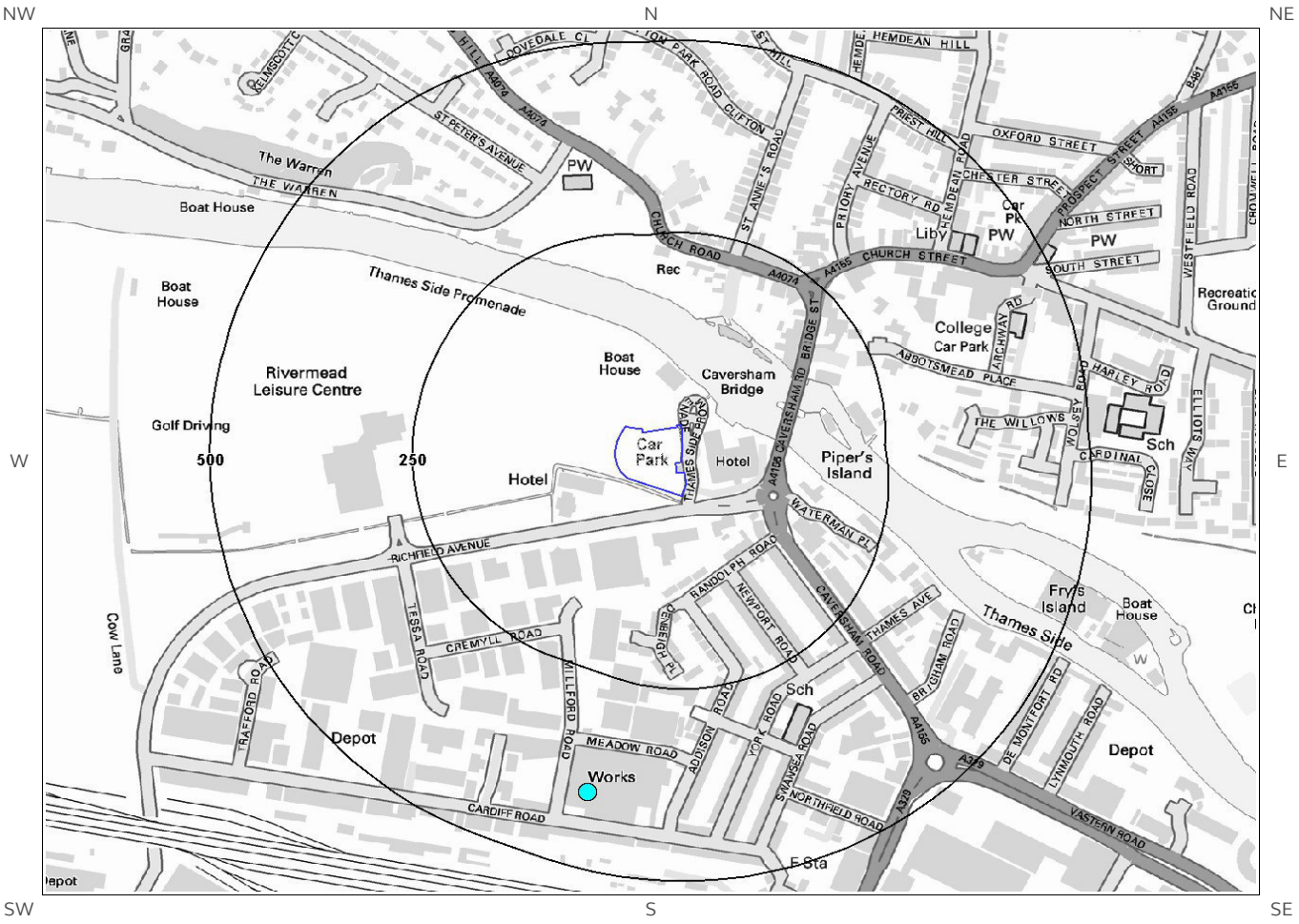
Surface Water Abstraction Licence

6c. Hydrogeology – Source Protection Zones and Potable Water Abstraction Licenses



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6d. Hydrogeology – Source Protection Zones within confined aquifer



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Source Protection Zone 1 - Inner Catchment

Source Protection Zone 2C - Outer Catchment within Confined Aquifer

Source Protection Zone 3C - Total Catchment within Confined Aquifer

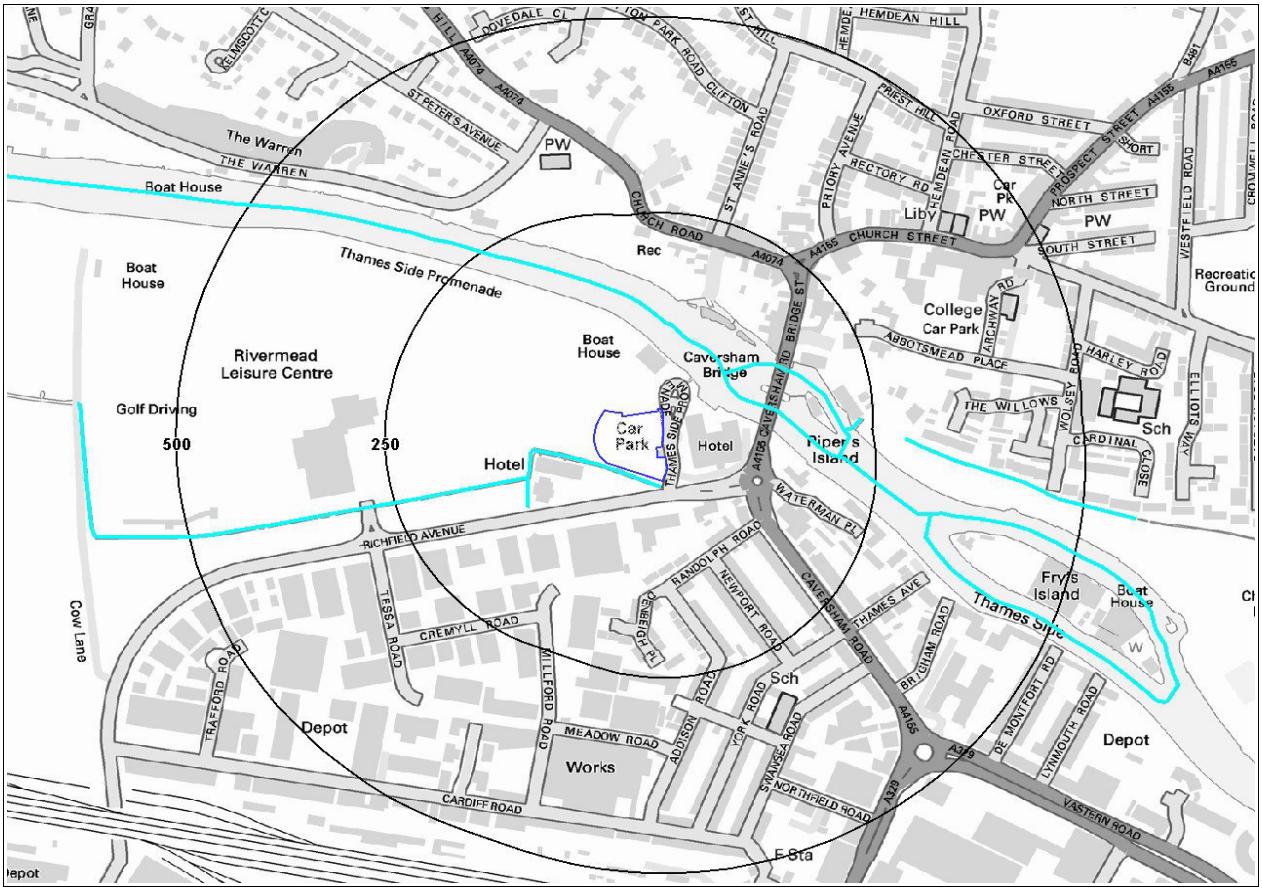
Potable Water Abstraction Licence

Site Outline

250
500
Search Buffers (m)

6e. Hydrology – Watercourse Network and River Quality

NW N NE



W E

SW S SE

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Site Outline

250 — 500 — Search Buffers (m)

Tidal River

Inland River

Underground or Elevated Tidal River

Underground or Elevated Inland River

Foreshore

General Quality Assessment: Chemistry

Canal

Underground or Elevated Canal

Lock or Flight of Locks

Lake, Reservoir, or Marsh

Drain or Transfer

General Quality Assessment: Biology

6.Hydrogeology and Hydrology

6.1 Aquifer within Superficial Deposits

Records of strata classification within the superficial geology at or in proximity to the property Yes

From 1 April 2010, the Environment Agency/Natural Resources Wales's Groundwater Protection Policy has been using aquifer designations consistent with the Water Framework Directive. For further details on the designation and interpretation of this information, please refer to the Groundsure Enviro Insight User Guide.

The following aquifer records are shown on the Aquifer within Superficial Geology Map (6a):

ID	Distance (m)	Direction	Designation	Description
10	0	On Site	Unproductive	These are rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow
1	19	NE	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers
11	198	N	Unproductive	These are rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow
2	426	N	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers
3	433	N	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers
8	464	NE	Secondary (undifferentiated)	Assigned where it is not possible to attribute either category A or B to a rock type. In general these layers have previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type

6.2 Aquifer within Bedrock Deposits

Records of strata classification within the bedrock geology at or in proximity to the property Yes

From 1 April 2010, the Environment Agency/Natural Resources Wales's Groundwater Protection Policy has been using aquifer designations consistent with the Water Framework Directive. For further details on the designation and interpretation of this information, please refer to the Groundsure Enviro Insight User Guide.

The following aquifer records are shown on the Aquifer within Bedrock Geology Map (6b):

ID	Distance (m)	Direction	Designation	Description
1	0	On Site	Principal	Geology of high intergranular and/or fracture permeability, usually providing a high level of water storage and may support water supply/river base flow on a strategic scale. Generally principal aquifers were previously major aquifers
2	422	N	Principal	Geology of high intergranular and/or fracture permeability, usually providing a high level of water storage and may support water supply/river base flow on a strategic scale. Generally principal aquifers were previously major aquifers

6.3 Groundwater Abstraction Licences

Groundwater Abstraction Licences within 2000m of the study site — Identified

The following Abstraction Licences records are represented as points, lines and regions on the Aquifer within Bedrock Geology Map (6b):

ID	Distance (m)	Direction	NGR	Details	
4A	402	S	470900 174100	Status: Active Licence No: 28/39/23/0167 Details: Non-Evaporative Cooling Direct Source: Thames Groundwater Point: Meadow Road, Reading, Berkshire Data Type: Point Name: MANROSE MANUFACTURING LTD	Annual Volume (m^3): 90920 Max Daily Volume (m^3): 727.4 Original Application No: - Original Start Date: 23/1/1990 Expiry Date: - Issue No: 101 Version Start Date: 30/6/2006 Version End Date:
5A	402	S	470900 174100	Status: Active Licence No: 28/39/23/0167 Details: Drinking, Cooking, Sanitary, Washing, (Small Garden) - Commercial/Industrial/Public Services Direct Source: Thames Groundwater Point: Meadow Road, Reading, Berkshire Data Type: Point Name: MANROSE MANUFACTURING LTD	Annual Volume (m^3): 90920 Max Daily Volume (m^3): 727.4 Original Application No: - Original Start Date: 23/1/1990 Expiry Date: - Issue No: 101 Version Start Date: 30/6/2006 Version End Date:
6A	402	S	470900 174100	Status: Historical Licence No: 28/39/23/0041 Details: Non-Evaporative Cooling Direct Source: Thames Groundwater Point: Cardiff Road, Reading, Berkshire Data Type: Point Name: COX & WYMAN LTD	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: WR.A/1988 Original Start Date: 11/7/1966 Expiry Date: - Issue No: 100 Version Start Date: 11/7/1966 Version End Date:
7A	402	S	470900 174100	Status: Historical Licence No: 28/39/23/0041 Details: Drinking, Cooking, Sanitary, Washing, (Small Garden) - Commercial/Industrial/Public Services Direct Source: Thames Groundwater Point: Cardiff Road, Reading, Berkshire Data Type: Point Name: COX & WYMAN LTD	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: WR.A/1988 Original Start Date: 11/7/1966 Expiry Date: - Issue No: 100 Version Start Date: 11/7/1966 Version End Date:
8	618	SW	470600 174000	Status: Active Licence No: 28/39/23/0128 Details: Process Water Direct Source: Thames Groundwater Point: Cardiff Road, Reading Point B Data Type: Point Name: HILLIER GROUP OF COMPANIES	Annual Volume (m^3): 6682 Max Daily Volume (m^3): 27.28 Original Application No: WR.A/4547 Original Start Date: 22/1/1975 Expiry Date: - Issue No: 100 Version Start Date: 1/4/2008 Version End Date:
9	683	SW	470400 174100	Status: Active Licence No: 28/39/23/0128 Details: Process Water Direct Source: Thames Groundwater Point: Cardiff Road, Reading Point A Data Type: Point Name: HILLIER GROUP OF COMPANIES	Annual Volume (m^3): 6682 Max Daily Volume (m^3): 27.28 Original Application No: WR.A/4547 Original Start Date: 22/1/1975 Expiry Date: - Issue No: 100 Version Start Date: 1/4/2008 Version End Date:

ID	Distance (m)	Direction	NGR	Details	
Not shown	836	W	470100 174600	Status: Active Licence No: 28/39/23/0070 Details: General Farming & Domestic Direct Source: Thames Groundwater Point: Little John's Farm, Reading (d) Data Type: Point Name: DRAYTON	Annual Volume (m^3): 9819 Max Daily Volume (m^3): 26.82 Original Application No: WR.A/3088 Original Start Date: 9/1/1967 Expiry Date: - Issue No: 100 Version Start Date: 9/1/1967 Version End Date:
Not shown	867	W	470100 174300	Status: Active Licence No: 28/39/23/0070 Details: General Farming & Domestic Direct Source: Thames Groundwater Point: Little John's Farm, Reading (e) Data Type: Point Name: DRAYTON	Annual Volume (m^3): 9819 Max Daily Volume (m^3): 26.82 Original Application No: WR.A/3088 Original Start Date: 9/1/1967 Expiry Date: - Issue No: 100 Version Start Date: 9/1/1967 Version End Date:
Not shown	884	E	471900 174400	Status: Active Licence No: 28/39/23/0020 Details: Laundry Use Direct Source: Thames Groundwater Point: 72 George Street, Caversham, - Borehole 'a' Data Type: Point Name: Berendsen UK Limited	Annual Volume (m^3): 68190 Max Daily Volume (m^3): 300.04 Original Application No: NPS/WR/021020 Original Start Date: 9/5/1966 Expiry Date: - Issue No: 102 Version Start Date: 12/1/2016 Version End Date:
Not shown	1002	S	471200 173500	Status: Active Licence No: 28/39/23/0042 Details: Drinking, Cooking, Sanitary, Washing, (Small Garden) - Commercial/Industrial/Public Services Direct Source: Thames Groundwater Point: Cheapside, Reading, Berkshire Data Type: Point Name: PRIMARK STORES LIMITED	Annual Volume (m^3): 14933 Max Daily Volume (m^3): 40.91 Original Application No: - Original Start Date: 11/7/1966 Expiry Date: - Issue No: 101 Version Start Date: 1/4/2008 Version End Date:
Not shown	1242	W	469700 174400	Status: Active Licence No: 28/39/23/0070 Details: General Farming & Domestic Direct Source: Thames Groundwater Point: Little John's Farm, Reading (c) Data Type: Point Name: DRAYTON	Annual Volume (m^3): 9819 Max Daily Volume (m^3): 26.82 Original Application No: WR.A/3088 Original Start Date: 9/1/1967 Expiry Date: - Issue No: 100 Version Start Date: 9/1/1967 Version End Date:
Not shown	1242	W	469700 174400	Status: Active Licence No: 28/39/23/0070 Details: General Farming & Domestic Direct Source: Thames Groundwater Point: Little Johm's Farm, Reading (b) Data Type: Point Name: DRAYTON	Annual Volume (m^3): 9819 Max Daily Volume (m^3): 26.82 Original Application No: WR.A/3088 Original Start Date: 9/1/1967 Expiry Date: - Issue No: 100 Version Start Date: 9/1/1967 Version End Date:
Not shown	1297	SW	469800 173900	Status: Historical Licence No: 28/39/23/0181 Details: Drinking, Cooking, Sanitary, Washing, (Small Garden) - Commercial/Industrial/Public Services Direct Source: Thames Groundwater Point: Battle Hospital, Oxford Road, Reading Data Type: Point Name: WEST BERKSHIRE HEALTH AUTHORITY	Annual Volume (m^3): 136875 Max Daily Volume (m^3): 400 Original Application No: WRA/5942 Original Start Date: 17/1/1992 Expiry Date: - Issue No: 100 Version Start Date: 7/1/1999 Version End Date:

ID	Distance (m)	Direction	NGR	Details	
Not shown	1473	W	469500 174200	Status: Active Licence No: 28/39/23/0070 Details: General Farming & Domestic Direct Source: Thames Groundwater Point: Little John's Farm, Reading (a) Data Type: Point Name: DRAYTON	Annual Volume (m^3): 9819 Max Daily Volume (m^3): 26.82 Original Application No: WR.A/3088 Original Start Date: 9/1/1967 Expiry Date: - Issue No: 100 Version Start Date: 9/1/1967 Version End Date:
Not shown	1835	W	469100 174600	Status: Historical Licence No: 28/39/23/0137 Details: General Farming & Domestic Direct Source: Thames Groundwater Point: Scours Lane, Reading (a - R) Data Type: Point Name: READING BOROUGH COUNCIL	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: WR.A/2453/4 Original Start Date: 17/11/1976 Expiry Date: - Issue No: 100 Version Start Date: 17/11/1976 Version End Date:
Not shown	1902	SE	472700 173600	Status: Historical Licence No: 28/39/22/0600 Details: Pollution Remediation Direct Source: Thames Groundwater Point: Former Gasworks, Kenavon Drive, Reading (5 Boreholes) Data Type: Point Name: M J GLEESON GROUP PLC	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: WRW/A/1061 Original Start Date: 31/7/2000 Expiry Date: 31/08/2001 Issue No: 1 Version Start Date: 31/7/2000 Version End Date:
Not shown	1908	W	469140 175200	Status: Historical Licence No: 28/39/23/0139 Details: General Farming & Domestic Direct Source: Thames Groundwater Point: Chazey Court Farm, Mapledurham Data Type: Point Name: EYSTON	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: - Original Start Date: 23/3/1977 Expiry Date: - Issue No: 101 Version Start Date: 9/9/1999 Version End Date:
Not shown	1937	W	469110 175200	Status: Historical Licence No: 28/39/23/0139 Details: General use relating to Secondary Category (Medium Loss) Direct Source: Thames Groundwater Point: Chazey Court Farm, Mapledurham, - Tubewell 'a' Data Type: Point Name: EYSTON	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: - Original Start Date: 23/3/1977 Expiry Date: - Issue No: 101 Version Start Date: 9/9/1999 Version End Date:

6.4 Surface Water Abstraction Licences

Surface Water Abstraction Licences within 2000m of the study site — Identified

The following Surface Water Abstraction Licences records are represented as points, lines and regions on the Aquifer within Bedrock Geology Map (6b):

ID	Distance (m)	Direction	NGR	Details	
22B	422	E	471440 174450	Status: Historical Licence No: 28/39/23/0196 Details: Transfer between sources Direct Source: Thames Surface Water - Non Tidal Point: Thames At Christchurch Meadow Data Type: Point Name: READING BOROUGH COUNCIL	Annual Volume (m^3): - Max Daily Volume (m^3): - Application No: WRW/A/1115 Original Start Date: 12/5/2003 Expiry Date: 31/3/2016 Issue No: 1 Version Start Date: 12/5/2003 Version End Date:

ID	Distance (m)	Direction	NGR	Details	
23B	422	E	471440 174450	Status: Historical Licence No: 28/39/23/0199/TR Details: Transfer Between Sources (Post Water Act 2003) Direct Source: Thames Surface Water - Non Tidal Point: River Thames - Christchurch Meadows Data Type: Point Name: READING BOROUGH COUNCIL	Annual Volume (m^3): 1752000 Max Daily Volume (m^3): 4800 Application No: WRW/A/1218 Original Start Date: 10/9/2008 Expiry Date: 31/3/2016 Issue No: 1 Version Start Date: 10/9/2008 Version End Date:
24B	422	E	471440 174450	Status: Historical Licence No: 28/39/23/0196 Details: Lake & Pond Throughflow Direct Source: Thames Surface Water - Non Tidal Point: Thames At Christchurch Meadow Data Type: Point Name: READING BOROUGH COUNCIL	Annual Volume (m^3): 31536 Max Daily Volume (m^3): 86.4 Application No: WRW/A/1115 Original Start Date: 12/5/2003 Expiry Date: 31/3/2016 Issue No: 1 Version Start Date: 1/4/2006 Version End Date:
Not shown	1097	E	472072 174185	Status: Active Licence No: TH/039/0023/022 Details: Transfer Between Sources (Post Water Act 2003) Direct Source: Thames Surface Water - Non Tidal Point: River Thames At Caversham Weir Data Type: Point Name: The Reading Sustainability Centre CIC	Annual Volume (m^3): 0 Max Daily Volume (m^3): 0 Application No: NPS/WR/020629 Original Start Date: 19/2/2016 Expiry Date: 31/3/2028 Issue No: 1 Version Start Date: 19/2/2016 Version End Date:
Not shown	1453	SE	471590 173150	Status: Historical Licence No: 28/39/22/0594 Details: Lake & Pond Throughflow Direct Source: Thames Surface Water - Non Tidal Point: The Oracle Centre, Reading Data Type: Point Name: ORACLE SHOPPING CENTRE LTD	Annual Volume (m^3): - Max Daily Volume (m^3): - Application No: - Original Start Date: 16/2/2000 Expiry Date: - Issue No: 1 Version Start Date: 16/2/2000 Version End Date:
Not shown	1453	SE	471590 173150	Status: Active Licence No: 28/39/22/0594 Details: Lake & Pond Throughflow Direct Source: Thames Surface Water - Non Tidal Point: St.giles Stream At The Oracle Centre, Reading Data Type: Point Name: ORACLE SHOPPING CENTRE LTD	Annual Volume (m^3): 737856 Max Daily Volume (m^3): 2016 Application No: - Original Start Date: 16/2/2000 Expiry Date: - Issue No: 1 Version Start Date: 16/2/2000 Version End Date:

6.5 Potable Water Abstraction Licences

Potable Water Abstraction Licences within 2000m of the study site — Identified

The following Potable Water Abstraction Licences records are represented as points, lines and regions on the SPZ and Potable Water Abstraction Licences Map (6c):

ID	Distance (m)	Direction	NGR	Details	
1A	402	S	470900 174100	Status: Historical Licence No: 28/39/23/0041 Details: Drinking, Cooking, Sanitary, Washing, (Small Garden) - Commercial/Industrial/Public Services Direct Source: Thames Groundwater Point: Cardiff Road, Reading, Berkshire Data Type: Point Name: COX & WYMAN LTD	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: WR.A/1988 Original Start Date: 11/7/1966 Expiry Date: - Issue No: 100 Version Start Date: Version End Date:

ID	Distance (m)	Direction	NGR	Details	
2A	402	S	470900 174100	Status: Active Licence No: 28/39/23/0167 Details: Drinking, Cooking, Sanitary, Washing, (Small Garden) - Commercial/Industrial/Public Services Direct Source: Thames Groundwater Point: Meadow Road, Reading, Berkshire Data Type: Point Name: MANROSE MANUFACTURING LTD	Annual Volume (m^3): 90920 Max Daily Volume (m^3): 727.4 Original Application No: - Original Start Date: 23/1/1990 Expiry Date: - Issue No: 101 Version Start Date: Version End Date:
Not shown	1002	S	471200 173500	Status: Active Licence No: 28/39/23/0042 Details: Drinking, Cooking, Sanitary, Washing, (Small Garden) - Commercial/Industrial/Public Services Direct Source: Thames Groundwater Point: Cheapside, Reading, Berkshire Data Type: Point Name: PRIMARK STORES LIMITED	Annual Volume (m^3): 14933 Max Daily Volume (m^3): 40.91 Original Application No: - Original Start Date: 11/7/1966 Expiry Date: - Issue No: 101 Version Start Date: Version End Date:
Not shown	1297	SW	469800 173900	Status: Historical Licence No: 28/39/23/0181 Details: Drinking, Cooking, Sanitary, Washing, (Small Garden) - Commercial/Industrial/Public Services Direct Source: Thames Groundwater Point: Battle Hospital, Oxford Road, Reading Data Type: Point Name: WEST BERKSHIRE HEALTH AUTHORITY	Annual Volume (m^3): 136875 Max Daily Volume (m^3): 400 Original Application No: WRA/5942 Original Start Date: 17/1/1992 Expiry Date: - Issue No: 100 Version Start Date: Version End Date:

6.6 Source Protection Zones

Source Protection Zones within 500m of the study site — None identified

Database searched and no data found.

6.7 Source Protection Zones within Confined Aquifer

Source Protection Zones within the Confined Aquifer within 500m of the study site — None identified

Historically, Source Protection Zone maps have been focused on regulation of activities which occur at or near the ground surface, such as prevention of point source pollution and bacterial contamination of water supplies. Sources in confined aquifers were often considered to be protected from these surface pressures due to the presence of a low permeability confining layer (e.g. glacial till, clay). The increased interest in subsurface activities such as onshore oil and gas exploration, ground source heating and cooling requires protection zones for confined sources to be marked on SPZ maps where this has not already been done.

Database searched and no data found.

6.8 Groundwater Vulnerability and Soil Leaching Potential

Environment Agency/Natural Resources Wales information on groundwater vulnerability and soil leaching potential within 500m of the study site Identified

Distance (m)	Direction	Classification	Soil Vulnerability Category	Description
0	On Site	Major Aquifer/High Leaching Potential	H1	Soils which readily transmit liquid discharges because they are shallow or susceptible to rapid flow directly to rock, gravel or groundwater.

6.9 River Quality

Environment Agency/Natural Resources Wales information on river quality within 1500m of the study site Identified

6.9.1 Biological Quality:

Database searched and no data found.

6.9.2 Chemical Quality:

Chemical quality data is based on the General Quality Assessment Headline Indicators scheme (GQAHI). In England, each chemical sample is measured for ammonia and dissolved oxygen. In Wales, the samples are measured for biological oxygen demand (BOD), ammonia and dissolved oxygen. The results are graded from A ('Very Good') to F ('Bad').

The following Chemical Quality records are shown on the Hydrology Map (6e):

					Chemical Quality Grade				
ID	Distance (m)	Direction	NGR	River Quality Grade	2005	2006	2007	2008	2009
Not shown	1199	E	472135 174053	River Name: Thames Reach: Whitchurch Stw - Kennet End/Start of Stretch: Sample Point NGR	A	A	A	A	A
Not shown	1449	SE	472020 173440	River Name: Kennet Reach: Holy Brook - Thames End/Start of Stretch: Start of Stretch NGR	B	A	A	A	A
Not shown	1449	SE	472020 173440	River Name: Kennet Reach: Foudry Brook - Holy Brook End/Start of Stretch: End of Stretch NGR	B	A	A	A	A

6.10 Ordnance Survey MasterMap Water Network

Ordnance Survey MasterMap Water Network entries within 500m of the study site

This watercourse information is provided by Ordnance Survey MasterMap Water Network. The data provides a detailed centre line following the curve of the waterway precisely, so all distances provided in the report should be understood as measurements to the centreline rather than a measurement to the nearest point of the watercourse. Underground watercourses are inferred from entry and exit points so caution is advised in using these to indicate precise locations of underground watercourses when planning site investigation and development.

The following Ordnance Survey MasterMap Water Network records are represented on the Hydrology Map (6e):

ID	Distance/ Direction	Name	Type of Watercourse	Additional Details
1	6 S	-	Inland river not influenced by normal tidal action.	Catchment Area: Thames Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 4.5
42	6 S	-	Inland river not influenced by normal tidal action.	Catchment Area: Thames Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 4.5
2	85 E	River Thames	Inland river not influenced by normal tidal action.	Catchment Area: Thames Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 47.5
43	85 E	River Thames	Inland river not influenced by normal tidal action.	Catchment Area: Thames Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 47.5
3	87 NE	River Thames	Inland river not influenced by normal tidal action.	Catchment Area: Thames Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 57.9
4	87 NE	River Thames	Inland river not influenced by normal tidal action.	Catchment Area: Thames Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 57.9
5	87 NE	River Thames	Inland river not influenced by normal tidal action.	Catchment Area: Thames Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 57.9
6	87 NE	River Thames	Inland river not influenced by normal tidal action.	Catchment Area: Thames Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 52.7
44	87 NE	River Thames	Inland river not influenced by normal tidal action.	Catchment Area: Thames Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 57.9

ID	Distance/ Direction	Name	Type of Watercourse	Additional Details
45	87 NE	River Thames	Inland river not influenced by normal tidal action.	Catchment Area: Thames Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 57.9
46	87 NE	River Thames	Inland river not influenced by normal tidal action.	Catchment Area: Thames Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 57.9
47	87 NE	River Thames	Inland river not influenced by normal tidal action.	Catchment Area: Thames Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 52.7
7	91 SW	-	Inland river not influenced by normal tidal action.	Catchment Area: Thames Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 2.6
8	91 SW	-	Inland river not influenced by normal tidal action.	Catchment Area: Thames Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 3.5
48	91 SW	-	Inland river not influenced by normal tidal action.	Catchment Area: Thames Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 2.6
49	91 SW	-	Inland river not influenced by normal tidal action.	Catchment Area: Thames Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 3.5
9	144 NE	River Thames	Inland river not influenced by normal tidal action.	Catchment Area: Thames Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
50	144 NE	River Thames	Inland river not influenced by normal tidal action.	Catchment Area: Thames Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
10	205 E	River Thames	Inland river not influenced by normal tidal action.	Catchment Area: Thames Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 63.1
11	205 E	River Thames	Inland river not influenced by normal tidal action.	Catchment Area: Thames Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 26.6
51	205 E	River Thames	Inland river not influenced by normal tidal action.	Catchment Area: Thames Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 63.1

ID	Distance/ Direction	Name	Type of Watercourse	Additional Details
52	205 E	River Thames	Inland river not influenced by normal tidal action.	Catchment Area: Thames Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 26.6
12	216 E	-	Inland river not influenced by normal tidal action.	Catchment Area: Thames Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 3.9
53	216 E	-	Inland river not influenced by normal tidal action.	Catchment Area: Thames Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 3.9
13	279 W	-	Inland river not influenced by normal tidal action.	Catchment Area: Thames Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 2.6
54	279 W	-	Inland river not influenced by normal tidal action.	Catchment Area: Thames Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 2.6
14	287 E	-	Inland river not influenced by normal tidal action.	Catchment Area: Thames Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 1.7
55	287 E	-	Inland river not influenced by normal tidal action.	Catchment Area: Thames Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 1.7
15	320 E	River Thames	Inland river not influenced by normal tidal action.	Catchment Area: Thames Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 35.9
56	320 E	River Thames	Inland river not influenced by normal tidal action.	Catchment Area: Thames Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 35.9
16	321 E	River Thames	Inland river not influenced by normal tidal action.	Catchment Area: Thames Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 33.7
57	321 E	River Thames	Inland river not influenced by normal tidal action.	Catchment Area: Thames Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 33.7
17	406 W	-	Inland river not influenced by normal tidal action.	Catchment Area: Thames Relationship to Ground Level: Not provided Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided

ID	Distance/ Direction	Name	Type of Watercourse	Additional Details
Not shown	406 W	-	Inland river not influenced by normal tidal action.	Catchment Area: Thames Relationship to Ground Level: Not provided Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
18	411 W	-	Inland river not influenced by normal tidal action.	Catchment Area: Thames Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 2.2
Not shown	411 W	-	Inland river not influenced by normal tidal action.	Catchment Area: Thames Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 2.2
19	456 E	-	Inland river not influenced by normal tidal action.	Catchment Area: Thames Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
Not shown	456 E	-	Inland river not influenced by normal tidal action.	Catchment Area: Thames Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
20	469 E	-	Inland river not influenced by normal tidal action.	Catchment Area: Thames Relationship to Ground Level: Not provided Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
Not shown	469 E	-	Inland river not influenced by normal tidal action.	Catchment Area: Thames Relationship to Ground Level: Not provided Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided

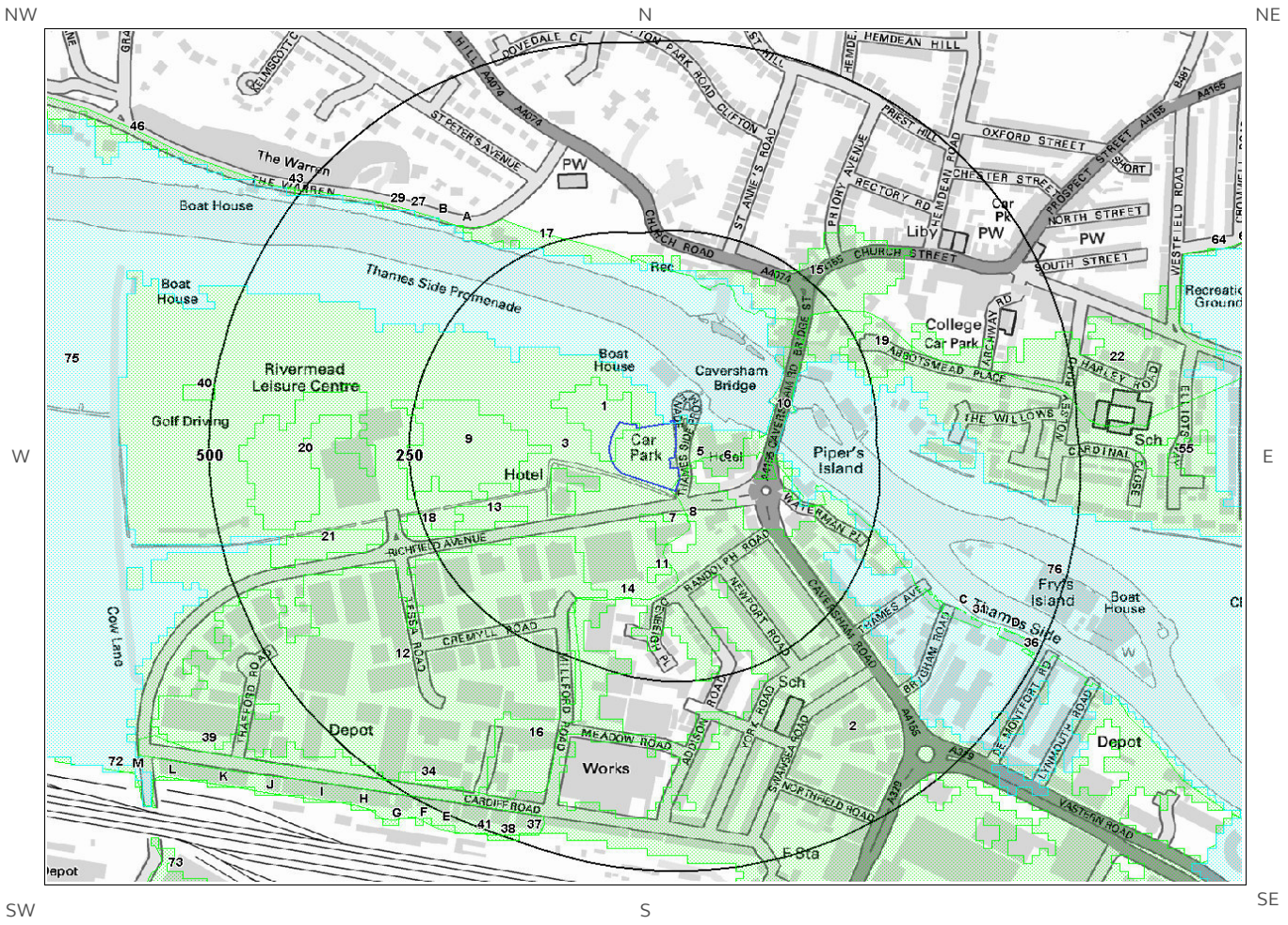
6.11 Surface Water Features

Surface water features within 250m of the study site Identified

The following surface water records are not represented on mapping:

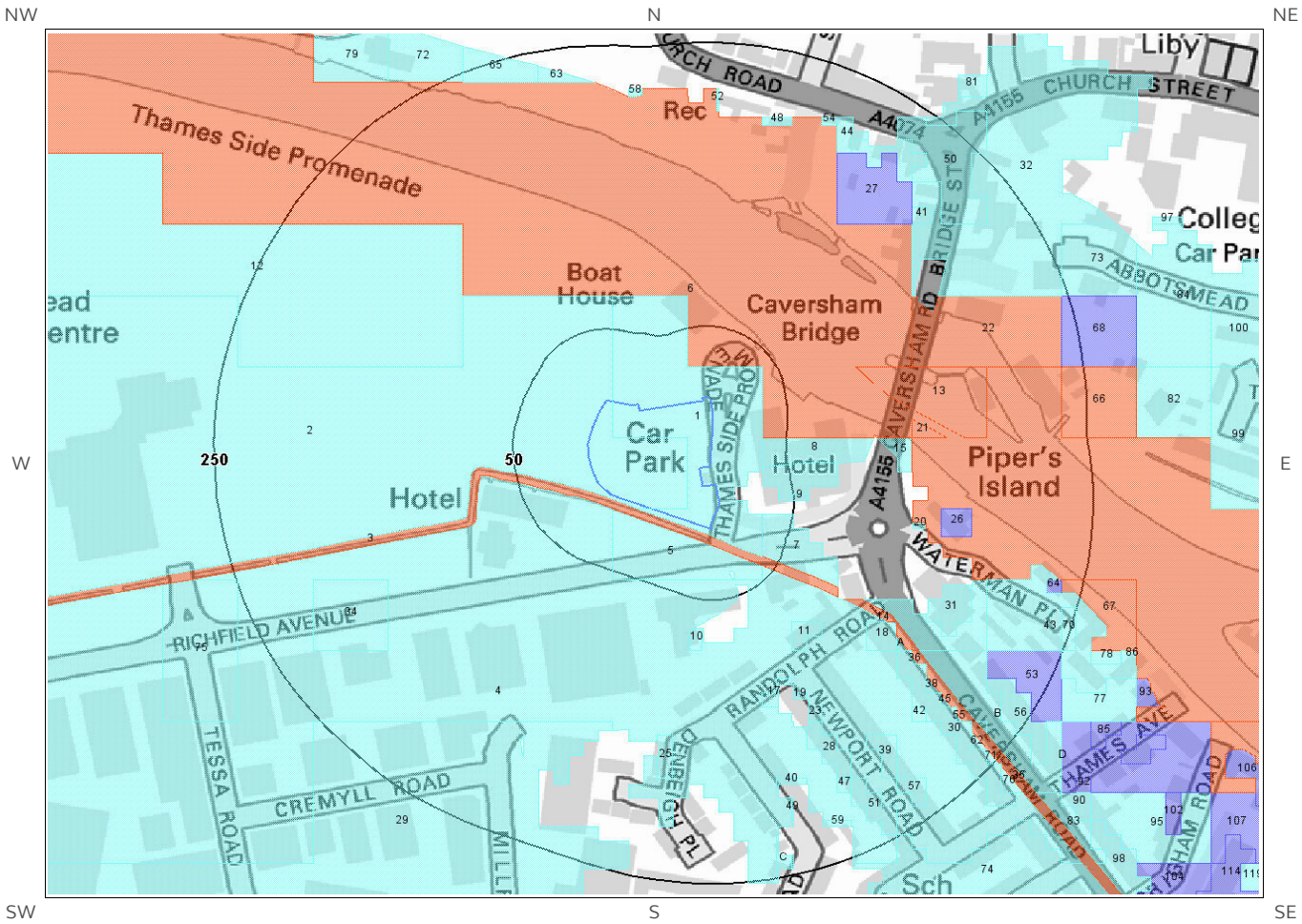
Distance (m)	Direction
4	S
44	NE
129	E
225	W

7a. Environment Agency/Natural Resources Wales Flood Map for Planning (from rivers and the sea)



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7b. Environment Agency/Natural Resources Wales Risk of Flooding from Rivers and the Sea (RoFRaS) Map



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Site Outline

100
250
Search Buffers (m)

RoFRaS Rating

Very Low

Low

Medium

High

7 Flooding

7.1 River and Coastal Zone 2 Flooding

Environment Agency/Natural Resources Wales Zone 2 floodplain within 250m — Identified

Environment Agency/Natural Resources Wales Zone 2 floodplains estimate the annual probability of flooding as between 1 in 1000 (0.1%) and 1 in 100 (1%) from rivers and between 1 in 1000 (0.1%) and 1 in 200 (0.5%) from the sea. Any relevant data is represented on Map 7a – Flood Map for Planning:

ID	Distance (m)	Direction	Update	Type
1	0	On Site	19-Mar-2018	Zone 2 - (Fluvial /Tidal Models)
2	0	On Site	19-Mar-2018	Zone 2 - (Fluvial /Tidal Models)
3	0	On Site	19-Mar-2018	Zone 2 - (Fluvial /Tidal Models)
4	23	SW	19-Mar-2018	Zone 2 - (Fluvial /Tidal Models)
5	23	NE	19-Mar-2018	Zone 2 - (Fluvial /Tidal Models)
6	24	NE	19-Mar-2018	Zone 2 - (Fluvial /Tidal Models)
7	30	S	19-Mar-2018	Zone 2 - (Fluvial /Tidal Models)
8	39	S	19-Mar-2018	Zone 2 - (Fluvial /Tidal Models)
9	73	W	19-Mar-2018	Zone 2 - (Fluvial /Tidal Models)
10	83	E	19-Mar-2018	Zone 2 - (Fluvial /Tidal Models)
11	100	S	19-Mar-2018	Zone 2 - (Fluvial /Tidal Models)
12	102	SW	19-Mar-2018	Zone 2 - (Fluvial /Tidal Models)
13	121	SW	19-Mar-2018	Zone 2 - (Fluvial /Tidal Models)
14	150	S	19-Mar-2018	Zone 2 - (Fluvial /Tidal Models)
15	170	NE	19-Mar-2018	Zone 2 - (Fluvial /Tidal Models)
16	193	S	19-Mar-2018	Zone 2 - (Fluvial /Tidal Models)
17	210	N	19-Mar-2018	Zone 2 - (Fluvial /Tidal Models)
18	216	SW	19-Mar-2018	Zone 2 - (Fluvial /Tidal Models)
19	224	NE	19-Mar-2018	Zone 2 - (Fluvial /Tidal Models)

7.2 River and Coastal Zone 3 Flooding

Environment Agency/Natural Resources Wales Zone 3 floodplain within 250m — Identified

Zone 3 shows the extent of a river flood with a 1 in 100 (1%) or greater chance of occurring in any year or a sea flood with a 1 in 200 (0.5%) or greater chance of occurring in any year. Any relevant data is represented on Map 7a – Flood Map for Planning.

ID	Distance (m)	Direction	Update	Type
1	0	On Site	19-Mar-2018	Zone 3 - (Fluvial Models)
2	123	E	19-Mar-2018	Zone 3 - (Fluvial Models)

7.3 Risk of Flooding from Rivers and the Sea (RoFRaS) Flood Rating

Highest risk of flooding onsite — Low

The Environment Agency/Natural Resources Wales RoFRaS database provides an indication of river and coastal flood risk at a national level on a 50m grid with the flood rating at the centre of the grid calculated and given above. The data considers the probability that the flood defences will overtop or breach by considering their location, type, condition and standard of protection.

RoFRaS data for the study site indicates the property is in an area with a Low (greater than 1 in 1000 but less than 1 in 100) chance of flooding in any given year.

Any relevant data within 250m is represented on the RoFRaS Flood map. Data to 50m is reported in the table below.

ID	Distance (m)	Direction	RoFRas flood Risk
1	0.0	On Site	Low
2	0.0	On Site	Low
3	2.0	S	High
4	8.0	S	Low
5	8.0	S	Low
6	22.0	N	High
7	29.0	E	Low
8	33.0	NE	Low
9	48.0	E	Low

7.4 Flood Defences

Flood Defences within 250m of the study site — None identified

Database searched and no data found.

7.5 Areas benefiting from Flood Defences

Areas benefiting from Flood Defences within 250m of the study site	None identified

7.6 Areas benefiting from Flood Storage

Areas used for Flood Storage within 250m of the study site	None identified

7.7 Groundwater Flooding Susceptibility Areas

7.7.1 British Geological Survey groundwater flooding susceptibility areas within 50m of the boundary of the study site	Identified
Clearwater Flooding or Superficial Deposits Flooding	Clearwater Flooding

Notes: Groundwater flooding may either be associated with shallow unconsolidated sedimentary aquifers which overlie unproductive aquifers (Superficial Deposits Flooding), or with unconfined aquifers (Clearwater Flooding).

7.7.2 Highest susceptibility to groundwater flooding in the search area based on the underlying geological conditions

Potential at Surface

Where potential for groundwater flooding to occur at surface is indicated, this means that given the geological conditions in the area groundwater flooding hazard should be considered in all land-use planning decisions. It is recommended that other relevant information e.g. records of previous incidence of groundwater flooding, rainfall, property type, and land drainage information be investigated in order to establish relative, but not absolute, risk of groundwater flooding.

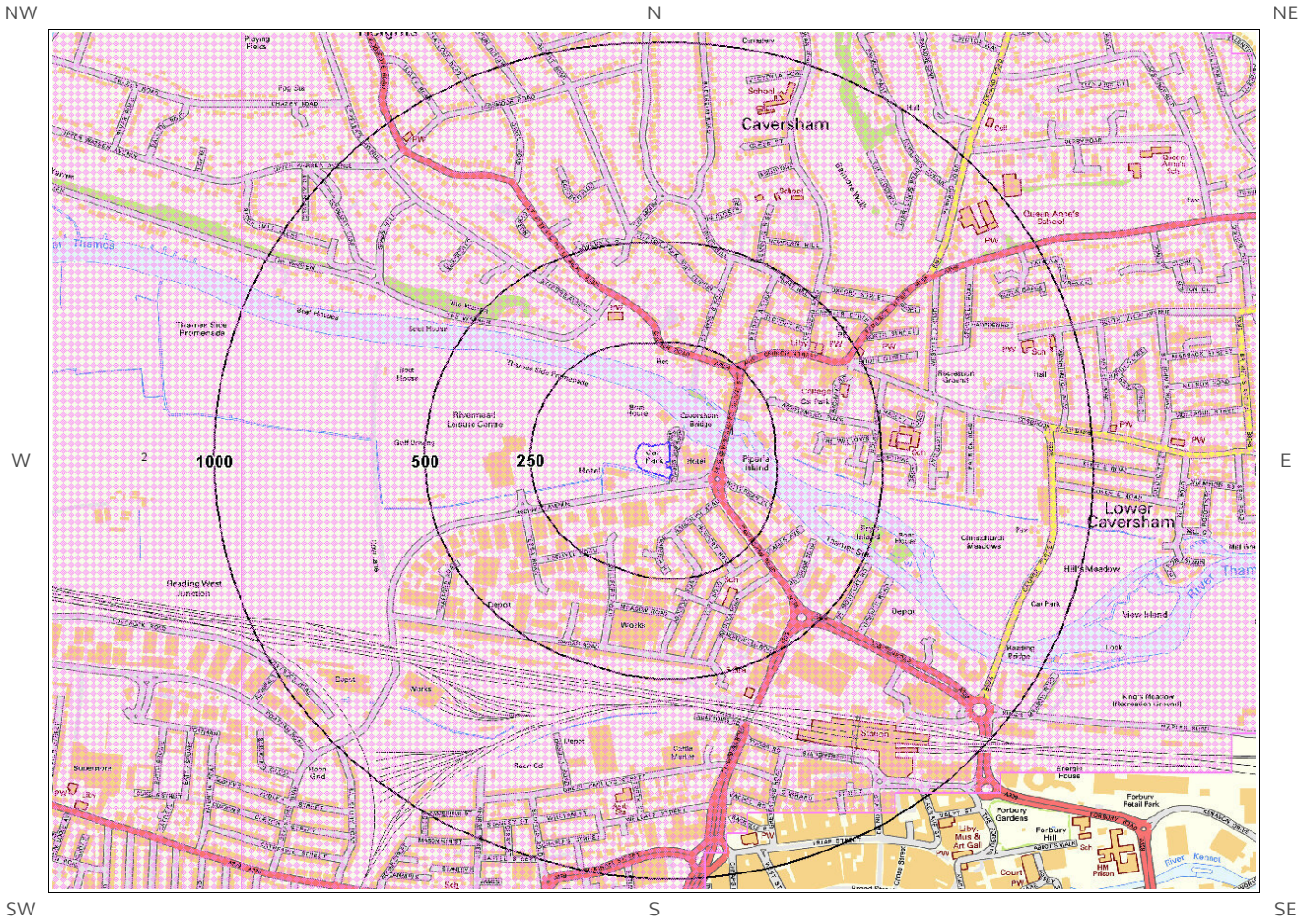
7.8 Groundwater Flooding Confidence Areas

British Geological Survey confidence rating in this result	High

Notes: Groundwater flooding is defined as the emergence of groundwater at the ground surface or the rising of groundwater into man-made ground under conditions where the normal range of groundwater levels is exceeded.

The confidence rating is on a threefold scale - Low, Moderate and High. This provides a relative indication of the BGS confidence in the accuracy of the susceptibility result for groundwater flooding. This is based on the amount and precision of the information used in the assessment. In areas with a relatively lower level of confidence the susceptibility result should be treated with more caution. In other areas with higher levels of confidence the susceptibility result can be used with more confidence.

8. Designated Environmentally Sensitive Sites Map



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Site Outline

100 / 250 Search Buffers (m)

AONB

National Park

SSSI

Special Protection Areas

Nitrate Vulnerable Zones

Green Belt

Environmentally Sensitive Areas

Special Areas of Conservation

World Heritage Sites

Nitrate Sensitive Areas

Ancient Woodland

National Nature Reserve

Local Nature Reserves

Ramsar Sites

8. Designated Environmentally Sensitive Sites

Designated Environmentally Sensitive Sites within 2000m of the study site	Identified

8.1 Records of Sites of Special Scientific Interest (SSSI) within 2000m of the study site:

0

Database searched and no data found.

8.2 Records of National Nature Reserves (NNR) within 2000m of the study site:

0

Database searched and no data found.

8.3 Records of Special Areas of Conservation (SAC) within 2000m of the study site:

0

Database searched and no data found.

8.4 Records of Special Protection Areas (SPA) within 2000m of the study site:

0

Database searched and no data found.

8.5 Records of Ramsar sites within 2000m of the study site:

0

Database searched and no data found.

8.6 Records of Ancient Woodland within 2000m of the study site:

0

Database searched and no data found.

8.7 Records of Local Nature Reserves (LNR) within 2000m of the study site:

0

Database searched and no data found.

8.8 Records of World Heritage Sites within 2000m of the study site:

0

Database searched and no data found.

8.9 Records of Environmentally Sensitive Areas within 2000m of the study site:

0

Database searched and no data found.

8.10 Records of Areas of Outstanding Natural Beauty (AONB) within 2000m of the study site:

1

The following Area of Outstanding Natural Beauty (AONB) records provided by Natural England/Natural Resources Wales are represented as polygons on the Designated Environmentally Sensitive Sites Map:

ID	Distance (m)	Direction	AONB/NSA Name	Data Source
3	1731	NW	Chilterns	Natural England

8.11 Records of National Parks (NP) within 2000m of the study site:

0

Database searched and no data found.

8.12 Records of Nitrate Sensitive Areas within 2000m of the study site:

0

Database searched and no data found.

8.13 Records of Nitrate Vulnerable Zones within 2000m of the study site:

2

The following Nitrate Vulnerable Zone records produced by DEFRA are represented as polygons on the Designated Environmentally Sensitive Sites Map:

ID	Distance (m)	Direction	NVZ Name	Data Source
1	0	On Site	Existing	DEFRA
2	934	W	Existing	DEFRA

8.14 Records of Green Belt land within 2000m of the study site:

0

Database searched and no data found.

9. Natural Hazards Findings

9.1 Detailed BGS GeoSure Data

BGS GeoSure Data has been searched to 50m. The data is included in tabular format. If you require further information on geology and ground stability, please obtain a Groundsure Geo Insight, available from our website. The following information has been found:

9.1.1 Shrink Swell

Maximum Shrink-Swell*[*] hazard rating identified on the study site — Very Low

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

Hazard
Ground conditions predominantly low plasticity. No special actions required to avoid problems due to shrink-swell clays. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with shrink-swell clays.

9.1.2 Landslides

Maximum Landslide* hazard rating identified on the study site — Very Low

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

Hazard
Slope instability problems are unlikely to be present. No special actions required to avoid problems due to landslides. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with landslides.

9.1.3 Soluble Rocks

Maximum Soluble Rocks* hazard rating identified on the study site — Very Low

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

Hazard
Significant soluble rocks are present. Problems unlikely except with considerable surface or subsurface water flow. No special actions required to avoid problems due to soluble rocks. No special ground investigation required or increased construction costs are likely. An increase in financial risk due to potential problems with soluble rocks is unlikely.

* This indicates an automatically generated 50m buffer and site.

9.1.4 Compressible Ground

Maximum Compressible Ground* hazard rating identified on the study site — Moderate

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

Hazard
Significant potential for compressibility problems. Avoid large differential loadings of ground. Do not drain or de-water ground near the property without technical advice. For new build consider possibility of compressible ground in ground investigation, construction and building design. Consider effects of groundwater changes. Extra construction costs are likely. For existing property possible increase in insurance risk from compressibility, especially if water conditions or loading of the ground change significantly.

9.1.5 Collapsible Rocks

Maximum Collapsible Rocks* hazard rating identified on the study site — Very Low

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

Hazard
Deposits with potential to collapse when loaded and saturated are unlikely to be present. No special ground investigation required or increased construction costs or increased financial risk due to potential problems with collapsible deposits.

9.1.6 Running Sand

Maximum Running Sand** hazard rating identified on the study site — Low

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

Hazard
Possibility of running sand problems after major changes in ground conditions. Normal maintenance to avoid leakage of water-bearing services or water bodies (ponds, swimming pools) should reduce likelihood of problems due to running sand. For new build consider possibility of running sand into trenches or excavations if water table is high or sandy strata are exposed to water. Avoid concentrated water inputs to site. Unlikely to be an increase in construction costs due to potential for running sand. For existing property no significant increase in insurance risk due to running sand problems is likely.

* This indicates an automatically generated 50m buffer and site.

9.2 Radon

9.2.1 Radon Affected Areas

Is the property in a Radon Affected Area as defined by the Health Protection Agency (HPA) and if so what percentage of homes are above the Action Level? The site is not in a Radon Affected Area, as less than 1% of properties are above the Action Level.

The radon data in this report is supplied by the BGS/Public Health England and is the definitive map of Radon Affected Areas in Great Britain and Northern Ireland. The dataset was created using long-term radon measurements in over 479,000 homes across Great Britain and 23,000 homes across Northern Ireland, combined with geological data. The dataset is considered accurate to 50m to allow for the margin of error in geological lines, and the findings of this report supercede any answer given in the less accurate Indicative Atlas of Radon in Great Britain, which simplifies the data to give the highest risk within any given 1km grid square. As such, the radon atlas is considered indicative, whereas the data given in this report is considered definitive.

9.2.2 Radon Protection

Is the property in an area where Radon Protection are required for new properties or extensions to existing
ones as described in publication BR211 by the Building Research Establishment? No radon protective measures are necessary.

10. Mining

10.1 Coal Mining

Coal mining areas within 75m of the study site — None identified

Database searched and no data found.

10.2 Non-Coal Mining

Non-Coal Mining areas within 50m of the study site boundary — None identified

Database searched and no data found.

10.3 Brine Affected Areas

Brine affected areas within 75m of the study site — None identified
Guidance: No Guidance Required.

Contact Details

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Acknowledgements: Site of Special Scientific Interest, National Nature Reserve, Ramsar Site, Special Protection Area, Special Area of Conservation data is provided by, and used with the permission of, Natural England/Natural Resources Wales who retain the Copyright and Intellectual Property Rights for the data.
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https://www.groundsure.com/terms-and-conditions-may25-2018

APPENDIX C
BGS Boreholes

PAGE: 8

DATE: 09.05.90

LOCATION

PORSCHE SHOWROOM - READING

TRIALPIT 5

DESCRIPTION	REDUCED LEVEL m	DEPTH m	LEGEND	SAMPLE TYPE	SAMPLE DEPTH	THICKNESS m	SPT	REMARKS
TARMAC		0.00				0.05		
Sand, gravel and brick HARDCORE		0.05				0.25		
Firm to soft dark brown sandy clayey silty FILL with concrete brick & wire rope		0.30				2.20		
Soft light brown clayey SILT		2.50				1.05		Standing water level after 1 hour
		2.75w						
Gravelly SAND		3.55				0.15		
		3.70						

TERRAMECH INVESTIGATIONS LIMITED
183 LONG LANE TILEHURST READING

REMARKS:

U100=100mm dia. UNDISTURBED SAMPLE U38=38mm dia. UNDISTURBED SAMPLE D=SMALL DISTURBED SAMPLE
B=BULK SAMPLE W=WATER SAMPLE SPT=STANDARD PENETRATION TEST CPT=CONE PENETRATION TEST

PAGE: 7	LOCATION	TRIALPIT 4
DATE: 09.05.90	PORSCHE SHOWROOM - READING	

DESCRIPTION	REDUCED LEVEL m	DEPTH m	LEGEND	SAMPLE TYPE	SAMPLE DEPTH	THICKNESS m	SPT	REMARKS
TARMAC		0.00				0.03		
Brick and sandy gravel HARDCORE		0.03				0.27		
Medium dense organic silty clayey sandy FILL with some roots		0.30				2.20		
Loose light brown silty clayey SAND		2.50						
		2.65	w			0.70		Standing water level after 1 hour
Loose gravelly SAND		3.20				0.20		
		3.40						

TERRAMECH INVESTIGATIONS LIMITED
183 LONG LANE TILEHURST READING

REMARKS:

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PAGE: 6	LOCATION	TRIALPIT 3
DATE: 09.05.90	PORSCHE SHOWROOM - READING	

DESCRIPTION	REDUCED LEVEL m	DEPTH m	LEGEND	SAMPLE TYPE	SAMPLE DEPTH	THICKNESS m	SPT	REMARKS
TARMAC		0.00				0.05		
Sandy gravel SUB-BASE		0.05				0.15		
Crushed rock HARDCORE		0.20				0.10		
Firm brown clayey sandy silty FILL with roots and some broken brick		0.30				2.60		
Loose light brown silty clayey SAND		2.75 / 2.90				0.50		-Standing water level after 1 hour
Loose gravelly SAND		3.40 / 3.60				0.20		

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183 LONG LANE TILEHURST READING

REMARKS:

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PAGE: 5

DATE: 09.05.90

LOCATION

PORSCHE SHOWROOM - READING

TRIALPIT 2

DESCRIPTION	REDUCED LEVEL m	DEPTH m	LEGEND	SAMPLE TYPE	SAMPLE DEPTH	THICKNESS m	SPT	REMARKS
TARMAC.....		0.00				0.05		
Medium dense sand, gravel and brick HARDCORE		0.05				0.25		
Medium dense dark brown/black silty ..... organic ash FILL with large lumps of clay & brick		0.30				3.00		
Soft light brown grey mottled clayey ..... SILT		3.05 W 3.30				0.60		Standing water level after 10 minutes
Loose brown slightly gravelly SAND.....		3.90 4.20				0.30		

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183 LONG LANE TILEHURST READING

REMARKS:

U100=100mm dia. UNDISTURBED SAMPLE U38=38mm dia. UNDISTURBED SAMPLE D=SMALL DISTURBED SAMPLE
B=BULK SAMPLE W=WATER SAMPLE SPT=STANDARD PENETRATION TEST CPT=CONE PENETRATION TEST

PAGE: 4

DATE: 09.05.90

LOCATION

PORSCHE SHOWROOM - READING

TRIALPIT 1

DESCRIPTION	REDUCED LEVEL m	DEPTH m	LEGEND	SAMPLE TYPE	SAMPLE DEPTH	THICKNESS m	SPT	REMARKS
TARMAC.....		0.00				0.05		
Medium dense sand, gravel and brick HARDCORE		0.05				0.25		
Firm dark brown sandy silty FILL with ..... lumps of concrete, masonry & organic matter		0.30				2.05		
Soft light brown grey mottled clayey ..... SILT		2.35				1.15		
Loose brown gravelly SAND		3.50				0.10		-Water entered at a moderate rate
		3.60						

TERRAMECH INVESTIGATIONS LIMITED
183 LONG LANE TILEHURST READING

REMARKS:

U100=100mm dia. UNDISTURBED SAMPLE U38=38mm dia. UNDISTURBED SAMPLE D=SMALL DISTURBED SAMPLE
B=BULK SAMPLE W=WATER SAMPLE SPT=STANDARD PENETRATION TEST CPT=CONE PENETRATION TEST

PAGE: 2

DATE: 09.05.90

LOCATION

PORSCHE SHOWROOM - READING

BOREHOLE 1

DESCRIPTION	REDUCED LEVEL m	DEPTH m	LEGEND	SAMPLE TYPE	SAMPLE DEPTH	THICKNESS m	SPT	REMARKS
TARMAC		0.00				0.05		
HARDCORE		0.05				0.25		
Brick and clay FILL		0.30						
				B	1.00			1048/1 / 1.0B
				D	1.50	2.40		1048/1 / 1.5D
				W	2.60			1048/1 / 2.6W Standing water level
Soft brown CLAY		2.70				0.70		
				B	3.40			1048/1 / 3.4B Water entered rapidly
Medium dense sand and GRAVEL		3.40		CPT	3.40		22	
				CPT	5.70	3.70	24	
				B	5.70			1048/1 / 5.7B
				CPT	7.10		14	
Remoulded CHALK containing lumps of intact chalk and flints - Grade V		7.10		B	7.10			1048/1 / 7.1B
				CPT	8.50		7	
				D	8.50			1048/1 / 8.5D
				CPT	10.00	5.40	4	
				B	10.00			1048/1 /10.0B
				CPT	11.50		8	
Firm rubbly CHALK with some remoulded chalk and flints - Grade IV		12.50		CPT	13.00		21	
				D	13.00			1048/1 /13.0D
				CPT	14.50	2.50	22	
				D	14.50			1048/1 /14.5D
		15.00						

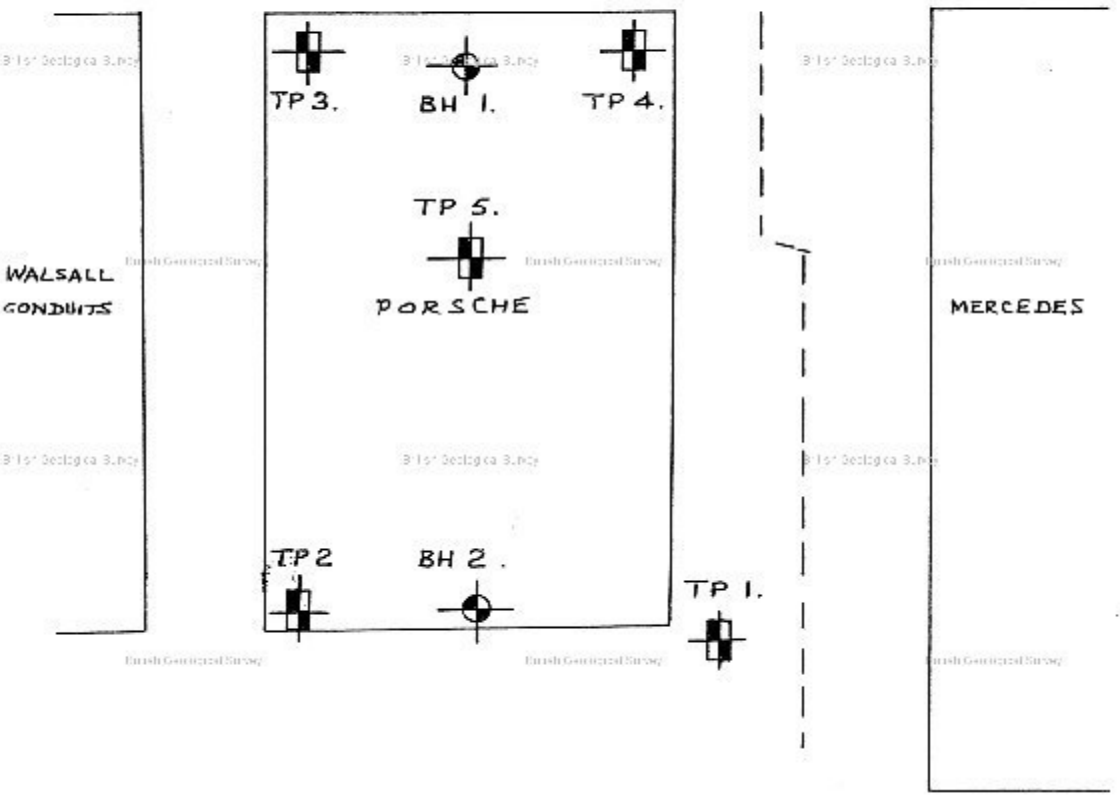
TERRAMECH INVESTIGATIONS LIMITED
183 LONG LANE TILEHURST READING

REMARKS:

U100=100mm dia. UNDISTURBED SAMPLE U38=38mm dia. UNDISTURBED SAMPLE D=SMALL DISTURBED SAMPLE
B=BULK SAMPLE W=WATER SAMPLE SPT=STANDARD PENETRATION TEST CPT=CONE PENETRATION TEST

PAGE: 1	LOCATION	BOREHOLE LAYOUT
DATE: 09.05.90	PORSCHE SHOWROOM - READING	

BOREHOLE LAYOUT



SUTTSW 124

Contract Name READING

Borehole No. 5

Sheet 2 **of** 2

Method of boring
Diameter

Ground level
Start
Finish

Daily progress	Water levels	In-situ tests	Samples	Depth (m)	Reduced level (m O.D.)	Thickness (m)	Description of Strata
			U			4.50	Hard rubbly chalk with a matrix of soft weathered chalk and some flints
		N=8	B				
28/9			U	13.50	24.96	1.50	Hard rubbly chalk with a matrix of stiff weathered chalk and some flints
		N=22	B				
29/9				15.00	23.46		Bottom of Borehole

Notes

SU77SW 124

Contract Name READING

Borehole No. 5

Sheet 1 **of** 2

Method of boring Shell and Auger
Diameter 200 mm nominal

Ground level 38.46 m OD
Start 27.9.77
Finish 29.9.77

Daily progress	Water levels	In-situ tests	Samples	Depth (m)	Reduced level (m O.D.)	Thickness (m)	Description of Strata
						1.50	Made Ground. Soft to firm grey brown clay with brick fragments, timber, and concrete
	27/9		B				
	29/9			1.50	36.96		
27/9	29/9		U			0.35	Firm grey brown clay with gravel and traces of roots
	28/9	N=12	B	1.85	36.61		
27/9	28/9	N=21	B				
		N=20	B				
		N=19	B			7.15	Medium dense well graded coarse to fine gravel with some brown sand
		N=16	B				
		N=16	B				
		N=18	B				
		N=7	B	9.00	29.46		

Contd/..

Notes

5.20 m of water level observation tubing installed

SU75SW 123

Contract Name	READING	Borehole No. 4
		Sheet 2 of 2

Method of boring
Diameter

Ground level
Start
Finish

Daily progress	Water levels	In-situ tests	Samples	Depth (m)	Reduced level (m O.D.)	Thickness (m)	Description of Strata
		N=16	B			5.00	Hard rubbly chalk with a matrix of stiff weathered chalk and some flints
			U				
5/10				13.00	25.05		
		N=90	B			2.00	Hard chalk with flints
6/10				15.00	23.05		Bottom of Borehole

Notes

SU77SW 123

Contract Name	READING	Borehole No. 4
		Sheet 1 of 2

Method of boring	Shell and Auger	Ground level	38.05m OD
Diameter	200 mm nominal	Start	4.10.77
		Finish	6.10.77

Daily progress	Water levels	In-situ tests	Samples	Depth (m)	Reduced level (m O.D.)	Thickness (m)	Description of Strata
							Made
4/10	▽ 5/10	N=9	B W			1.90	Soft to firm dark brown clay with brick fragments, gravel, cobbles and building rubble
6/10	▽						
	▽			1.90	36.15		Ground
	4/10 ▼	N=22	B				
	6/10 ▽						
	5/10						
		N=25	B				
		N=15	B			6.10	Medium dense well graded coarse to fine gravel with some brown sand
		N=14	B				
		N=11	B				
4/10		N=11	B				
		N=13	B	8.00	30.05		
			U				
							Contd/.

Notes

SUTISW 122

Contract Name	READING	Borehole No. 3
		Sheet 2 of 2

Method of boring
Diameter

Ground level
Start
Finish

Daily progress	Water levels	In-situ tests	Samples	Depth (m)	Reduced level (m O.D.)	Thickness (m)	Description of Strata
			U				
						4.70	Hard rubbly chalk with a matrix of soft weathered chalk and some flints
7/10		N=13	B				
				13.00	25.40		
			U				
		N=57	B				
						7.00	Hard chalk with flints
8/10		N=71	B				
		N=68	B				
		N=81	B				
				20.00	18.40		
8/10							Bottom of Borehole

Notes

SU77SW B2

Contract Name	READING	Borehole No. 3
		Sheet 1 of 2

Method of boring	Shell and Auger	Ground level	38.40 m OD
Diameter	200 mm	Start	6.10.77
		Finish	8.10.77

Daily progress	Water levels	In-situ tests	Samples	Depth (m)	Reduced level (m O.D.)	Thickness (m)	Description of Strata
							Made
						1.95	Soft to firm dark brown clay with brick fragments, timber and building rubble
		N=6	B				
6/10	▽ 7/10		W				
6/10	▽	N=14	B	1.95	36.45		Ground
6/10	▽ 7/10						
	▽ 8/10	N=26	B				
		N=19	B				
						6.35	Medium dense well graded coarse to fine gravel with a little brown sand
		N=24	B				
		N=22	B				
		N=24	B				
		N=12	B				
				8.30	30.10		
		N=8	B				
							Contd/..

Notes

Relocating rig to miss obstruction 3½ hours

SU78SW 121

Contract Name	READING	Borehole No. 2
		Sheet 2 of 2

Method of boring
Diameter

Ground level
Start
Finish

Daily progress	Water levels	In-situ tests	Samples	Depth (m)	Reduced level (m O.D.)	Thickness (m)	Description of Strata
		N=15	B			4.60	Hard rubbly chalk with a matrix of stiff weathered chalk and some flints
			U	13.00	25.48		
						2.00	Hard chalk with flints
		N=37	B				
30/9				15.00	23.48		Bottom of Borehole

Notes

SUTTSW 121

Contract Name	READING	Borehole No. 2
		Sheet 1 of 2

Method of boring	Shell and Auger	Ground level	38.48 m OD
Diameter	200 mm nominal	Start	29.9.77
		Finish	30.9.77

Daily progress	Water levels	In-situ tests	Samples	Depth (m)	Reduced level (m O.D.)	Thickness (m)	Description of Strata
							Made
			U			2.20	Soft to firm grey brown clay with brick fragments, gravel, timber wire, building rubble and traces of roots
30/9		29/9					
29/9		30/9	W	2.20	36.28		Ground
		N=13	B				
29/9		N=18	B			6.20	Medium dense well graded coarse to fine gravel with some brown sand
		N=28	B				
		N=20	B				
		N=17	B				
		N=22	B				
		N=9	B	8.40	30.08		
			U				Contd/..

Notes

Terresearch Limited	Report No. S.27/535	Appendix 1 Sheet 3

SU77SW 120

Contract Name	READING	Borehole No. 1
		Sheet 2 of 2

Method of boring
Diameter

Ground level
Start
Finish

Daily progress	Water levels	In-situ tests	Samples	Depth (m)	Reduced level (m O.D.)	Thickness (m)	Description of Strata
			U			5.30	Hard rubbly chalk with a matrix of soft weathered chalk and some flints
		N=19	B				
			U	13.50	24.80		
		N=55 for 75mm	B			1.50	Hard chalk with flints
3/10				15.00	23.30		Bottom of Borehole

Notes

SU77SW 120

Contract Name READING

Borehole No. 1

Sheet 1 **of** 2

Method of boring Shell and Auger

Diameter 200 mm nominal

Ground level 38.30 m OD

Start 1.10.77

Finish 3.10.77

Daily progress	Water levels	In-situ tests	Samples	Depth (m)	Reduced level (m O.D.)	Thickness (m)	Description of Strata
							Made Ground
		N=5	B			1.75	Soft to firm dark brown clay with brick fragments, gravel, building rubble and a trace of peat
1/10	3/10						
3/10	1/10			1.75	36.55		
		N=6	WB				
		N=16	B				
		N=23	B			6.45	Loose to medium dense well graded coarse to fine gravel with some brown sand
		N=25	B				
1/10							
		N=18	B				
		N=13	B				
		N=13	B	8.20	30.10		
		N=16	B				

Contd/..

Notes

British Geological Survey

Institute of Geological Sciences

MINERAL ASSESSMENT UNIT

Sand and Gravel Survey

BOREHOLE RECORD SHEET

Borehole Reg. No. SU 77 SW/8

Nat. Grid Ref. 7044 7475.

Locality Thames Side Promenade: Reading

Date started 28th Nov. 1972

Date finished 30th Nov. 1972

Recorded by C. E. CORSER.

Drilled by Sinclaclores

Drill type Percussion

Hole diameter 152 mm

Surface level ft. OD

Water struck at 3.8 m below surface

Water struck at ft. OD

Depth(s) bailed

Mean grading percentages

Fines Sand Gravel

Classification of ground	Thickness m	Nature
Overburden	3.8	Made-ground clays silts etc
Mineral	6.9	Gravel and Sand.
Bedrock	0.5+	chalk
	11.2	

Remarks Typical River Valley gravel with a mixed gravel composition comprising flint quartz, quartzite, sandstone and limestones. etc. Sand typically medium to coarse with little if any fines.

	Description of Strata	Thickness m	Depth to base m	Sample Nos.
Overburden	Made-Ground Concrete, soil, rubbish, clay, bricks etc. (Sports and Parking ground)	2.2	2.2	—
Overburden	Clay: grey-brown, very silty no gravel: suggest alluvial-silt deposit	1.6	3.8	special Sample
Valley Gravel	Gravel and Sand	1.0	4.8	MT1268
		1.0	5.8	MT1269
		1.0	6.8	MT1270
		1.0	7.8	MT1271
		1.0	8.8	MT1272
		1.0	9.8	MT1273
		0.9	10.7	MT1274

Special Sample of the various gravel components of MT1269/74

APPENDIX D
Legislative Background

Legislative Background

Environmental liabilities and risks have been evaluated in terms of a source -pathway - target relationship in accordance with the approach set out in:

- The 1995 Environment Act;
- The Contaminated Land (England) Regulations 2000;
- The DETR circular 02/2000 Environmental Protection Act 1990: Part IIA Contaminated Land.

Contaminated land is defined within the legislative framework as land which is in such condition by reason of substances in, on or under the land that:

1) Significant harm is being caused or there is a significant possibility of such harm being caused;
2) Significant pollution of controlled waters is being or is likely to be caused.

The potential for harm is based on the presence of three factors:

- **Source** - substances that are potential contaminants or pollutants that may cause harm;
- **Pathway** - a potential route by which contaminants can move from the source to the receptor;
- **Receptor** - a receptor that may be harmed, for example the water environment, humans and water.

Where a source, pathway and target are all present a pollutant linkage exists and there is potential for harm to be caused. The presence of a source does not automatically imply that a contamination problem exists, since contamination must be defined in terms of pollutant linkages and unacceptable risk of harm. The nature and importance of both pathways and receptors are site specific and will vary according to the intended end use of the site, its characteristics and its surroundings.

The key principle which supports the SPR approach is 'suitable for use' criteria. This requires remedial action only where contamination is considered to pose unacceptable actual or potential risks to health or the environment and, taking into account the proposed use of the site.

Relevant Guidance Documents

This report has been prepared in accordance with the list of guidance below however the list is not exhaustive:

- CLR11 – Model Procedures;
- Contamination and Environmental Matters - Their implications for Property Professionals (2nd Edition RICS Nov 2003);
- Brownfields – Managing the development of previously developed land – A client's guide, CIRIA 2002;
- DEFRA and Environment Agency publications CLR7 – 10, supported by the TOX guides and SGV guides, dated March 2002;
- DETR Circular 02/2000, Contaminated Land: Implementation of Part IIA of the Environmental Protection Act 1990;
- Environment Agency technical advice to third parties on Pollution of Controlled Waters for Part IIA of the EPA1990, May 2002;

Relevant Legislative Documents

The following is a non-exhaustive list of legislative framework documents that has been considered in the production of this report:

- The Environment Act (1995);
- The Environmental Protection Act 1990: Part 2A Contaminated Land Statutory Guidance (2012);
- The Environment Protection Act (1990);
- The Contaminated Land (England) Act (2000);
- Contaminated Land (England) Regulations (2012);
- The Water Resources Act (1991);
- The Pollution Prevention and Control (England and Wales) Regulations (2000);
- The Landfill Regulations (England and Wales) Regulations (2002);
- The Landfill (England and Wales) (Amendment) Regulations (2004);
- Health and Safety at Work Act;

APPENDIX E
Risk Assessment Methodology

Contaminated Land Risk Assessment

Contaminated Land Risk Assessment is a technique that identifies and considers the associated risk, determines whether the risks are significant and whether action needs to be taken. The four main stages of risk assessment are:

Hazard Identification ⇨ Hazard Assessment ⇨ Risk Estimation ⇨ Risk Evaluation

CLR11 outlines the framework to be followed for risk assessment in the UK. The framework is designed to be consistent with UK legislation and policies including planning. The starting point of the risk assessment is to identify the context of the problem and the objectives of the process. Under CLR11, three tiers of risk assessment exist - Preliminary, Generic Quantitative and Detailed Quantitative.

Formulating and developing a conceptual model for the site is an important requirement of risk assessment, this supports the identification and assessment of pollutant linkages. Development of the conceptual model forms the main part of preliminary risk assessment, and the model is subsequently refined or revised as more information and understanding is obtained through the risk assessment process.

Risk is a combination of the likelihood of an event occurring and the magnitude of its consequences. Therefore, both the likelihood and the consequences of an event must be taken into account when assessing risk.

The risk assessment process needs to take into account the degree of confidence required in decisions. Identification of uncertainties is an essential step in risk assessment.

The likelihood of an event is classified on a four-point system using the following terms and definitions from CIRIA C552:

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

The severity is also classified using a system based on CIRIA C552. The terms and definitions are:

- **Severe**: Short term (acute) risk to human health likely to result in 'significant harm' as defined by the Environment Protection Act 1990, Part IIA. Short-term risk of pollution of sensitive water resources. Catastrophic damage to buildings or property. A short-term risk to a particular ecosystem or organism forming part of that ecosystem (note definition of ecosystem in 'Draft Circular on Contaminated Land', DETR 2000);
  Examples – High concentrations of contaminant on surface of recreation area, major spillage of contaminants from site into controlled waters, explosion causing building to collapse;

- **Medium**: Chronic damage to human health ('significant harm' as defined in DETR 2000). Pollution of sensitive water resources. A significant change in a particular ecosystem or organism forming part of that ecosystem (note definition of ecosystem in 'Draft Circular on Contaminated Land', DETR 2000);
  Examples - Concentrations of contaminants exceed the generic assessment criteria, leaching of contaminants from a site to a Principal or Secondary Aquifer, death of species within a designated nature reserve;

- **Mild**: Pollution of non-sensitive water resources. Significant damage to crops, buildings, structures and services ('significant harm' as defined in 'Draft Circular on Contaminated Land', DETR 2000). Damage to sensitive buildings, structures, services or the environment;
  Examples – Pollution of non-classified groundwater or damage to buildings rendering it unsafe to occupy.

- **Minor**: harm, not necessarily significant harm, which may result in financial loss or expenditure to resolve. Non-permanent health effects to human health (easily prevented by use of personal protective clothing etc). Easily repairable effects of damage to buildings, structures and services.
  Examples – Presence of contaminants at such concentrations PPE is required during site work, loss of plants in landscaping scheme or discolouration of concrete.

Once the likelihood and severity have been determined, a risk category can be assigned using the table below.

		Consequences			
		Severe	**Medium**	**Mild**	**Minor**
Probability	**Highly likely**	Very high	High	Moderate	Moderate/low
	Likely	High	Moderate	Moderate/low	Low
	Low likelihood	Moderate	Moderate/low	Low	Very low
	Unlikely	Moderate/low	Low	Very Low	Very low

Definitions of the risk categories obtained from the above table are as follows together with an assessment of the further work that might be required:

- **Very high**: There is a high probability that severe harm could arise to a designated receptor from an identified hazard or there is evidence that severe harm is currently happening. This risk, if realised, could result in substantial liability. Urgent investigation and remediation are likely to be required;

- **High**: Harm is likely to arise to a designated receptor from an identified hazard. Realisation of the risk is likely to present a substantial liability. Urgent investigation is required and remedial works may be necessary in the short term and are likely over the longer term;

- **Moderate**: It is possible that harm could arise to a designated receptor from an identified hazard. However, it is either relatively unlikely that any such harm would be severe, or if any harm were to occur it would be more likely to be relatively mild. Investigation is normally required to clarify the risk and determine the liability. Some remedial works may be required in the longer term;

- **Low**: It is possible that harm could arise to a designated receptor from an identified hazard, but it is likely that this harm, if realised, would at worst normally be mild;

- **Very Low**: There is a low possibility that harm could arise to a receptor. In the event of such harm being realised, it is not likely to be severe.

APPENDIX F
Ground Gas Guidance

Ground Gas Guidance

Redevelopment on brownfield sites is an ever increasing occurrence, including those sites where a potential ground gas issue is present.

CIRIA C665 is the current guidance which gives up-to-date advice on all aspects of ground gas. It outlines good practice in investigation, the collection of relevant data and monitoring programmes in a risk-based approach to gas contaminated land. Two semi-quantitative methods are set out for the assessment of risk:

1 For low rise housing with a ventilated under floor void at minimum 150 mm (Boyle and Witherington);
2 For all other development types (Wilson and Card).

Both methods use the concept of Gas Screening Values (GSVs) to identify levels of risk. The mitigation and management of potentially unacceptable risk is described with reference to both passive and active systems of gas. Source removal is also discussed as an option.

CIRIA C665 and the advice it contains has been prepared to be generally consistent with CLR11 *Model Procedures for the management of land contamination* (Defra and Environment Agency, 2004a). The aim of CIRIA C665 is a consistent approach to decision making, particularly relating to the scope of protective design measures on a site specific basis.

Legislative Framework

CIRIA C665 provides technical guidance however also recognises the context into which the guidance has to be employed. Government policy is based upon a "suitable for use approach", which is relevant to both the current and proposed future use of land. When considering the current use of land, Part IIA of the Environment Protection Act 1990 provides the regulatory regime. The presence of hazardous ground gases could provide the "source" in a "pollutant linkage" which could lead the regulator to determine that considerable harm or there is a significant possibility of such harm being caused. Under such circumstances, the regulator would determine the land to be "contaminated land" under the provisions of the Act, setting out the process of remediation as described in the DETR Circular 02/2000 *Statutory guidance on contaminated land* (DETR, 2000a).

Frequency and Duration of Monitoring

The monitoring period for a specific site covers the "worst case" scenario. A "worst case" scenario will occur during falling atmospheric pressure and, in particular, weather conditions such as rainfall, frost and dry weather.

The benefits of the additional information and whether it is likely to change the scope of gas protection should be considered, as are the consequences of failing to characterise adequately pollutant linkages. Investigations concerned with soil gas are required to provide monitoring data sufficient to allow prediction of worst case conditions enabling the confident assessment of risk and subsequent design of appropriate gas protection schemes. Monitoring programmes should not be an academic exercise in data collection.

Below are matrices that will aid in determining an appropriate number of gas monitoring visits and the length of monitoring period.

Typical/idealised periods of monitoring

		Generation of Potential Source				
		Very Low	**Low**	**Moderate**	**High**	**Very High**
Sensitivity of Development	**Low (Commercial)**	1 month	2 months	3 months	6 months	12 months
	Moderate (Flats)	2 months	3 months	6 months	12 months	24 months
	High (Residential with Gardens)	3 months	6 months	6 months	12 months	24 months

Typical/idealised frequency of monitoring

		Generation of Potential Source				
		Very Low	**Low**	**Moderate**	**High**	**Very High**
Sensitivity of Development	**Low (Commercial)**	4	6	6	12	12
	Moderate (Flats)	6	6	9	12	24
	High (Residential with Gardens)	6	9	12	24	24

Note

1 NHBC guidance also recommends this period of monitoring (Boyle and Witherington, 2007).
2 There is no industry consent over "high", "medium" or "low" generation potential of source.
3 At least two sets of readings should be at low and falling atmospheric pressure (but not restricted to periods below <1000 mb) known as worst case conditions. Historical data can be used as part of the data set (Table 5.5b).

It is recommended that newly installed monitoring wells are left for 24 hours to allow the soil gas to reach equilibrium. It should be recognised, however, that some soil gas regimes could take considerably longer (up to seven days). Interpretation of any initial readings should take this equilibrium process into account.

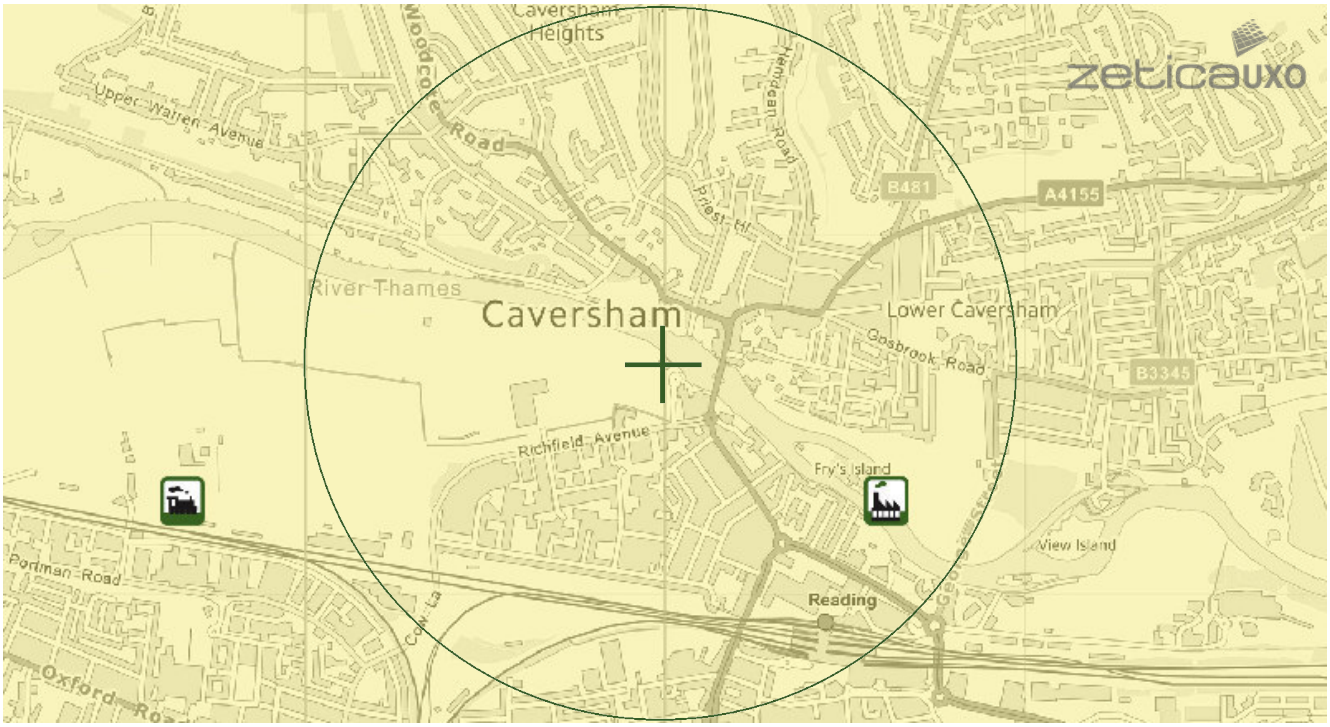
APPENDIX G
UXO Bomb Risk Map

UNEXPLODED BOMB RISK MAP

zeticaUXO

SITE LOCATION

Location: RG1 8BD,
Map Centre: 471000,174642



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.

miltary | **industry** | **UXO find**
transport | **dock** | **Luftwaffe targets**
utilities | **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.

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/)**

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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'.

APPENDIX H
Limitations

Standard Limitations

This desk study report was conducted and has been prepared for the sole internal use and reliance of the Client, Redefine Hotels Reading Ltd. This report shall not be relied upon or transferred to any other parties without the express written authorisation of BSL. If an unauthorised third party comes into possession of this report they rely on it at their risk and the authors owe them no duty of care or skill.

The findings and opinions conveyed via the desk study are based on information obtained from a variety of sources as detailed within this report, which BSL believes are reliable. Nevertheless, BSL cannot and does not guarantee the authenticity or reliability of the information it has relied upon.

Any recommendations made in this report should be confirmed with the Regulatory bodies and Planning Authority prior to implementation to ensure compliance.

No existing manhole covers were lifted or drainage runs inspected during the course of this ground investigation.

The site plans enclosed in this report should not be scaled off.