



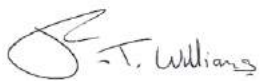
DESK STUDY REPORT

for the site at

LAND AT GIPSY LANE, TILEHURST, READING, BEKSHIRE RG30 6EG

on behalf of

ALPHA ONE PROPERTIES

Report Reference: GWPR1993/DS/June2017		Status: FINAL
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1.0 INTRODUCTION

1.1 General

Ground and Water Limited were instructed by Alpha One Properties on the 9th February 2017 to conduct a Desk Study on a redevelopment site on land at Gypsy Lane (rear of 246-250 Rodway Lane), Tilehurst, Reading, Berkshire RG30 6EG. The scope of the investigation was detailed within the Ground and Water Limited fee proposal ref: GWQ3197, dated 26th January 2017.

1.2 Aims of the Investigation

This Phase 1 Desk Study was undertaken to advise the client on risk factors pertaining to the site with special reference to former and present day potential contaminative uses and their impact on sensitive receptors, these being human health, controlled waters, buildings, building materials and services.

The geotechnical aspects of the proposed development will also be discussed with special reference to land stability.

1.3 Conditions and Limitations

This report has been prepared based on the terms, conditions and limitations outlined within Appendix A of this report.

2.0 SITE SETTING

2.1 Site Location

The site comprised an approximately 500m² square shaped plot of land, located on the northern side of Gypsy Lane, to the east of Portmeirion Gardens, and to the rear of 246 – 250 Rodway Road. The site was located to the south-west of Mcllory Park in Tilehurst, north-west Reading.

A site location plan can be seen in Figure 1 with a plan showing the site area presented in Figure 2. The approximate O.S. National Grid Reference for the centre of the site was SU 67704 74180.

2.2 Site Description

A Site Walkover was undertaken in April 2017. A description of the site, as noted during the Site Walkover, is tabulated below. An aerial view of the site showing an approximate site boundary is given within Figure 3.

Site Description: Land at Gypsy Lane, Tilehurst, Reading, Berkshire RG30 6EG	
Use of site	At the time of the Site Walkover, April 2017, the site was occupied by two single storey brick and breeze block built residential type structures. A caravan was also present in the centre of the site. Generally the site was used as a storage area for various household and commercial materials/waste.
Site topography	A moderate downward slope (to the north) was noted in the southern portion of the site. The slope steepened in the northern portion.
Area topography	Rodway Road, ~50m north of the site, was generally flat and sloping in a south-easterly direction. Rodway Road was positioned in a valley with sloping valley sides to the north and south. The site was located on the southern valley side associated with Rodway Road, sloping in a north-easterly direction.
Structures on-site	The site was occupied by two single storey brick and breeze block built residential structures. A caravan was also present in the centre of the site. A small ~2m high wooden hut used for wood storage was noted in the western portion of the site.
Structures off-site and use of surrounding ground	Residential properties, and their rear gardens, were noted directly north of the site associated with Rodway Road, running east to west. Additional residential properties associated with Portmeirion Gardens were noted ~20-100m west of the site. Various residential properties were noted ~50m - >250m south-west – south-east of the site. Mature trees were noted to the immediate west and east. A public footpath was noted directly south with an isolated area of mature trees, bushes, shrubs.
Boundary features	Northern Boundary: ~3.0m wooden fence with occasional ~2.0m high Heras fencing. In addition a ~5.0 – 7.0m high Rhododendron was present. Eastern Boundary: ~3.0m high hedgerow with ~1m high wooden fence. Southern Boundary: ~3.0m wooden fence. Western Boundary: ~2.0m high metal/heras fence.
Site covering	The northern portion of the site was covered by the following: area of burnt materials / oil drums used for burning waste within; trampoline / slide, digger / JCB, and pond. The eastern portion of the site was covered by the following: paved walkway, single storey brick and breeze block built residential type structure. The central portion of the site was covered by the following: single storey brick and breeze block built residential type structure; caravan; small vegetable patch; metal fragments; scaffolding; butane canisters; outdoor kitchen; cooking oils; car batteries; brake discs and brakes. The southern portion of the site was covered by the following: washing machines, car batteries, butane canisters; plant pots; metal fragments; wood fragments and plastic fragments. The western portion of the site was covered by the following: plastic bottles; metal fragments, wood fragments; wood storage hut; glass / glass fragments; concrete fragments; brick fragments and tyres.

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Site Description: Land at Gypsy Lane, Tilehurst, Reading, Berkshire RG30 6EG (cont.)	
Contamination sources on-site	Areas of burnt materials, oil drums used for burning within, were noted in the northern portion of the site. Metal fragments, brake discs and car batteries were noted in the central portion of the site. Car batteries and metal fragments were also noted in the southern portion of the site. In the western portion of the site a stockpile of tyres were noted. Potential Japanese Knotweed noted in northern portion of the site.
Contamination sources off-site	None noted.
Vegetation on-site	A ~5.0 – 7.0m high Rhododendron was noted in the north-western corner of the site. Grassland was noted in the north portion of the site. Potential Japanese Knotweed noted in northern portion of the site. A ~3m high hedgerow was noted along the eastern portion of the site.
Vegetation off-site	A ~12m high tree was noted in the north-western portion of the site. ~15-18m high trees were noted directly west/south-west/north-west of the site. Mature trees, shrubs and bushes were noted along the footpath to the south.
Services	None noted.
Comments	Potential Japanese Knotweed noted in northern portion of the site.
Land Stability Comments	No evidence for shallow or deep slope instability was noted during the Site Walkover. However, some of the small stockpiles of man-made debris were showing signs of creep due to excessive stockpiling.

Photographs of the site taken during the Site Walkover are presented in Appendix B.

2.3 Proposed Development

At the time of reporting, June 2017, the exact nature of the proposed development was not known. However, the redevelopment is likely to comprise demolition of the existing structures and construction of residential flats/houses with communal/private garden areas, parking and site access.

2.4 Geology

The BGS Geological Map (Solid and Drift) for the Tilehurst area (Reading Sheet No. 268) revealed that the site was underlain by bedrock deposits of the Lambeth Group overlying the Undifferentiated Seaford Chalk Formation and Newhaven Chalk Formation. An area of Head Deposits were shown ~50m south of the site and a capping of the Black Park Gravel Member was shown ~125m to the north. An expanse of Worked Ground was noted ~100m south and ~150m south-west of the site.

Worked Ground

Only major areas of worked ground, generally associated with mineral extraction, are shown on the published maps. In most cases the nature of the fill is unknown.

Head Deposits

Periglacial activity in a succession of cold periods and more recent downwash was responsible for the formation of Head Deposits and Head Gravel Deposits. Head is widespread in the district but had been mapped mainly in valleys where locally more than 2m may occur. The lithology of Head Deposits is determined largely by the parent materials upslope.

Black Park Gravel Member

The Black Park Gravel Member is found within the Thames Valley and associated tributaries and generally comprises sand and gravel with possible lenses of silt, clay or peat. The stratum is between 1-6m in thickness with an average of ~3m.

Lambeth Group

The Lambeth Group (formerly known as the Woolwich and Reading Beds) is a sedimentary complex comprising a basal bed (the Upnor Formation also known as the Bottom Bed) composed of glauconitic sand, sandy clay and gravel (well-rounded flint pebbles), with laterally variable sand and clay above. In the eastern part of the area the basal bed is mostly overlain by a shelly grey sandy clay or silty sand and laminated beds (Woolwich Formation). At the top of the sedimentary complex is the Reading Formation, which is made up of multi-coloured mottled clays and silty clays.

Undifferentiated Seaford Chalk Formation and Newhaven Chalk Formation

The Undifferentiated Seaford Chalk Formation and Newhaven Chalk Formation is a soft white friable microporous limestone composed of coccolith biomicrites with a varying proportion of larger shell fragments. Flint characterises the Undifferentiated Seaford Chalk Formation and Newhaven Chalk Formation, occurring as nodular courses, tabular beds and linings to fractures.

At various levels clay sized material occurs as marl seams and partings. Close to the surface the upper few metres are invariably discoloured brown, due to leaching from the overlying strata. The interface with any overlying stratum is invariably extremely irregular as a result of localised weathering and dissolution. Weathering by frost action may extend to a depth of several metres.

Occasional erosional features, such as pipes, swallow holes and solution cavities, usually in-filled with drift deposits; can be found in the chalk deposits. These features sometimes manifest themselves at the surface as shallow circular depressions. Solution features may be reactivated by the concentrated ingress of water from leaking drains or soakaways. Reactivation may lead to surface collapse.

2.5 Hydrogeology and Hydrology

A study of the aquifer maps on the Environment Agency website and the Groundsure Enviroinsight datasheets, presented in Appendix D of this report, revealed the site to be underlain by a **Secondary (A) Aquifer** relating to the bedrock deposits of the Lambeth Group. The underlying bedrock deposits of the Undifferentiated Seaford Chalk Formation and Newhaven Chalk Formation were classed as a **Principal Aquifer**. The area of Head Deposits ~50m south of the site and the capping of the Black Park Gravel Member ~125m to the north were both classified as a **Secondary a Aquifer**.

Superficial drift deposits are described as permeable unconsolidated (loose) deposits e.g. sands and gravels. The bedrock is described as solid permeable formations e.g. sandstone, chalk and limestone.

A Principal Aquifer is a layer of rock or drift deposits that have high intergranular and/or fracture permeability - meaning they usually provide a high level of water storage. They may support water supply and/or river base flow on a strategic scale. In most cases, principal aquifers are aquifers previously designated as major aquifer.

Secondary aquifers include a wide range of drift deposits with an equally wide range of water permeability and storage capacities. Secondary (A) Aquifers consist of deposits with 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.

Examination of the Environment Agency records showed that the site **was not** located within a Groundwater Source Protection Zone (SPZ) as classified in the Policy and Practice for the Protection of Groundwater. The nearest such feature was to the north-west associated with Purley on Thames.

The nearest surface water feature was the River Thames ~300m north / north-east of the site, flowing in an easterly direction.

From analysis of hydrogeological and topographical maps groundwater may be anticipated at moderate depth (5 – 7m bgl) within the Lambeth Group and then at depth (>10.00m bgl) within the underlying chalk. It was considered that shallower groundwater was likely to be flowing in an overall north-easterly direction, with topography down slope. On reaching the base of the valley, groundwater will likely then flow south-east. Deep groundwater in the chalk may flow north-west towards a Groundwater Source Protection Zone.

Examination of the Environment Agency records showed that the site fell within a Flood Zone 1 (an area with a low probability of river or sea flooding).

2.6 Radon

BRE 211 (2015) Map 4 of Hampshire, Berkshire and south Oxfordshire revealed the site **was not** located within an area where mandatory protection measures against the ingress of Radon were likely to be required. The site **was not** located within an area where a risk assessment was required.

3.0 HISTORICAL REVIEW

3.1 Historical Map Review

The object of this search was to report on the history of the site and its environs from available County Series, Ordnance Survey and Aerial Photography Maps dating from the mid to late 19th Century to the present day and downloaded from Groundsure Environmental Insight. In the following sections dealing with individual maps, only features considered to have a potential contaminative impact on the site and usually within a notional 250 metre radius of the site boundaries are discussed. Any distances quoted for features remote from the site have been scaled from the maps and are only approximate. The north point and approximate extent of the site are indicated on each figure. The historical maps referred to are given within Appendix C. The implications of the map search are discussed later within this report.

Environmental Significance of Data From Historical Maps			
Date	Scale	Site	Environs
1877 – 1881	1:2,500	Generally the site comprised open fields with the exception of a line of trees running along the southern boundary of the site, alongside Gypsy Lane.	Open fields were noted directly adjacent to the site to ~100m north, ~120m east, >250m south and ~240m west. Kentwood Grove was noted ~90m north-east to ~180m north-west, running in a south-easterly to north-westerly direction. A road labeled as Gypsy Lane was noted directly south of the site, running in a west to east direction. A chalk pit was noted ~160m north-east of the site. Round Copse was noted ~110 - >250m south-east of the site. Kentwood kiln was noted ~250m west of the site. An old Gravel pit was noted ~150m north-west of the site.
1878	1:10,560	As previous map.	As previous map.
1897	1:2,500	Data only available >120m north-east to south-west of the site. Remainder assumed as previous map.	Data only available >120m north-east to south-west of the site. The chalk pit noted ~160m north-east of the site was labeled old chalk pit. Remainder as previous map.
1897 – 1899	1:2,500	Data only available >120m north-east to south-west of the site. Remainder assumed as previous map.	Data only available >120m north-east to south-west of the site. Remainder as previous map.
1900	1:10,560	As previous map.	As previous map.
1900	1:10,560	As previous map.	As previous map.
1910	1:10,560	As previous map.	Kentwood Kiln noted ~250m west of the site was no longer present and had been replaced with a pumping station. Kew Kiln was established ~160 – 250m west of the site. Remainder as previous map.
1911 – 1913	1:2,500	As previous map.	Embanked land associated with old gravel pit ~150m north-west still present.
1932 – 1934	1:2,500	As previous map.	A clay pit was noted ~110 – 250m south of the site. An unlabeled structure was noted ~160m south-west of the site. An area of embanked land was noted ~230 - >250m west of the site. Remainder as previous map.
1932	1:10,560	As previous map.	As previous map
1936	1:2,500	As previous map.	An orchard was noted ~220 – 250m north of the site. A sand pit was noted ~240 - >250m north-east of the site. The former chalk pit noted ~160m north-east of the site was reopened as a gravel pit and enlarged. The area of stepped land associated with the former gravel pit ~150m north-west was no longer present. Embanked land to the south, associated with clay pits, was enlarged to the south and south-west. Remainder as previous map.
1938	1:10,560	As previous map.	As previous map.
1938	1:10,560	As previous map.	As previous map.
1938	1:10,560	As previous map.	As previous map.
1960 – 1961	1:10,560	As previous map.	Residential development had occurred directly north and east, and ~80- >250m west of the site. The unlabeled structure noted ~160m south-west of the site was no longer present. An additional clay pit was noted ~120->250m south-west of the site. A large works was noted ~250m west of the site. Remainder as previous map.

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Environmental Significance of Data From Historical Maps			
Date	Scale	Site	Environs
1961	1:1,250	The site remained undeveloped and on northern side of Gypsy Lane. Multiple areas of embanked land were noted along the northern and southern boundaries of the site. Also noted immediate west.	Multiple areas of embanked land, with ponds, were noted along Gypsy Lane, directly east and west and ~100->250m west to south. Ponds were noted ~160m south-east and ~230m south-west of the site. Allotment gardens were noted ~120 -160m and ~170 – 250m north-west of the site. Embanked land associated with Rodway Road and Vale Crescent cut into existing slope present to the north and north-west. Remainder as previous map.
1967 – 1971	1:2,500	A rear garden, associated with a property directly north of the site, extended into the north-eastern portion of the site.	One of the allotments, noted ~170 – 250m north-west of the site, had been converted to garages. Remainder as previous map.
1968	1:10,560	As previous map	As previous map
1976	1:10,000	As previous map	The clay pit noted ~100->250m south – south-west of the site was no longer labeled, all stepped land associated with the clay pit was still noted. Remainder as previous map.
1978 – 1982	1:1,250	As previous map	Residential development had occurred ~10->250 south-east to south of the site. An electricity sub-station was noted ~180m west of the site. The infilled land associated with the clay pit noted ~100->250m south – south-west of the site was no longer present. Remainder as previous map.
1982 – 1983	1:10,000	As previous map	Additional residential development has occurred ~20 - >250m south-west of the site. Remainder as previous map.
1983 – 1987	1:1,250	As previous map	An electricity sub-station was noted ~90m south of the site. Small scale residential development was noted ~10 – 50m west of the site. Remainder as previous map.
1988 – 1993	1:1,250	As previous map	As previous map
1991	1:10,000	As previous map	As previous map
1993	1:1,250	As previous map	As previous map
2002	1:10,000	As previous map	As previous map
2010	1:10,000	As previous map	As previous map
2014	1:10,000	As previous map	As previous map

4.0 GROUNDSURE DATASHEETS

4.1 GroundSure Datasheets

GroundSure Environmental and Geological Datasheets were obtained for the site. Unless the data indicates a significant risk, only information within a 250m buffer zone has been included. A copy of the GroundSure Datasheets is presented in Appendix D and a summary is given below and overleaf.

Environmental Significance Of Data Search	
Source	Nearest Distance from Site/Direction/Type/Dated
Historical Industrial Sites	
Potentially Historical Contaminative Uses Identified from 1:10,000 scale mapping	38 off-site records within 250m radius: 1 x Unspecified kiln 28m west (1901), 1 x Gravel pit 36m north-west (1901), 1 x Unspecified commercial / Industrial 47m west (1901), 1 x Unspecified ground workings 47m west (1901), 1 x Clay pit 74m south-west (1960), 2 x Unspecified ground workings 122m (x2) south (1932 – 1938), 1 x Railway sidings 146m west (1901), 2 x Old gravel pit 150 – 151m north-west to west (1900), 1 x Unspecified kiln 152m west (1878), 6 x Unspecified pit 158 - 173 north-east (1910 – 1991), 2 x Old chalk pit 159 – 168m north-east (1900), 3 x Clay pit 165 – 187m south – south-west (1932 – 1960), 1 x Unspecified works 198m west (1960), 3 x Unspecified ground workings 208 – 213m (1901 – 1938), 1 x Unspecified kiln 236m west (1900), 3 x Pumping station 236m (x3) west (1900 – 1938), 2 x Brick work, tile kiln and pottery works 240m (x2) west (1878 – 1910), 2 x Unspecified commercial / industrial 241 – 247m west (1900), 1 x Unspecified ground workings 247m west (1900), 1 x Unspecified kiln 250m west (1900).
Additional Information – Historical Tank Database	None within 250m radius.
Additional Information – Historical Energy Features Database	6 off-site records within 250m radius: 3 x Electricity sub-station 81m south (1978 – 1993), 3 x Electricity sub-station 164 west (1979 – 1993).
Additional Information – Historical Petrol and Fuel Site Database	None within a 250m radius.
Additional Information – Historical Garage and Motor Vehicle Database	None within a 250m radius.
Potentially Infilled Land	26 off-site records within 250m radius: 1 x Gravel pit 36m north-east (1901), 1 x Unspecified ground workings 47m west (1901), 1 x Clay pit 74m south-west (1960), 2 x Unspecified ground workings 122m south (1932 – 1938), 2 x Old gravel pit 150 – 151m north-west to west (1900), 6 X unspecified pit 158-173m north-east (1910 – 1991), 2 x Old chalk pit 165-168m north-east (1900) 3 x Clay pit 165 – 187m south-west (1932 – 1960), 1 x Sand pit 170m north-east (1960), 1 x Unspecified pit 208m south (1960), 4 x Unspecified ground workings 208 – 247m west – south-west 1 x Pond 220m south-west (1901), 2 x brick, tile kiln and pottery works 240m (1878 – 1910).

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Environmental Significance Of Data Search	
Source	Nearest Distance from Site/Direction/Type/Dated
Industrial Sites Holding Licences and/or Authorisations	
Records of historic IPC Authorisations	None within a 250m radius.
Records of Part A(1) and IPPC Authorised Activities	None within a 250m radius.
Records of Red List Discharge Consents	None within a 250m radius.
Records of List 1 Dangerous Substances Inventory Sites	None within a 250m radius.
Records of List 2 Dangerous Substance Inventory Sites	None within a 250m radius.
Records of Part A(2) and Part B Activities and Enforcements	None within a 250m radius.
Records of Category 3 or 4 Radioactive Substances Authorisations	None within a 250m radius.
Records of Licensed Discharge Consents	None within a 250m radius.
Records of Water Industry Referrals	None within a 250m radius.
Records of Planning Hazardous Substance Consents and Enforcements	None within a 250m radius.
Dangerous or Hazardous Sites	
Records of COMAH & NIHHS Sites	None within a 250m radius.
Environment Agency Recorded Pollution Incidents	
Records of National Incidents Recording System, List 2	None within a 250m radius.
Records of National Incidents Recording System, List 1	None within a 250m radius.
Sites Determined as Contaminated Land under Part IIA EPA1990	
Records of sites determined as contaminated land under Section 78R of the Environmental Protection Act 1990	None within a 250m radius.
Landfill and Other Waste Sites	
Landfill Sites	
Records of Environment Agency Registered Landfill Sites	None within a 250m radius.
Records of Environment Agency Historic Landfill Sites	1 off-site record within 250m radius: Beecham Hill, Reading, 219m north-east. Waste type: Inert and industrial.
Records of BGS/DoE non-operational landfill sites	None within a 250m radius.
Records of Landfills in Local Authority and Historical Mapping Records	None within a 250m radius.
Landfill and Other Waste Sites Findings	
Records of Operational and Non-Operational Waste Treatment, Transfer or Disposal Sites	None within a 250m radius.
Records of Environment Agency Licensed Waste Sites	None within a 250m radius.
Current Land Uses	
Records of Current Industrial Sites	2 off-site records within 250m radius: 1 x Electricity sub-station 84m south, 1 x Electricity sub-station 182m west.
Records of Petrol and Fuel Sites	None within a 250m radius.
Records of National Grid Underground Electricity Cables	None within a 250m radius.
Records of National Grid Gas Transmission Pipelines	None within a 250m radius.

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Environmental Significance Of Data Search Cont'd	
Source	Nearest Distance from Site/Direction/Type/Dated
Geology	
Artificial Ground and Made Ground	None on-site or within 50m radius.
Superficial Ground and Drift Geology	1 record within a 50m radius. Head (Gravel, sandy, silty and clay).
Bedrock and solid Geology	2 records on-site: On-site: Lambeth Group (Clay, silt and sand) On-site: Seaford Chalk Formation and Newhaven Chalk Formation (Chalk).
Hydrogeology and Hydrology	
Groundwater Abstraction Licences	
Records of Aquifer within Superficial Deposits	2 records within 250m radius: 46m south: Secondary A Aquifer, 128m north-east: Secondary A Aquifer.
Records of Aquifer within Bedrock Deposits	2 record on-site: On-site: Secondary A 28m north-east: Principal Aquifer
Records for Surface Water Abstraction Licences	None within a 250m radius.
Records for Potable Water Abstraction Licences	None within a 250m radius.
Source Protection Zones	
Source Protection Zone	None within a 250m radius.
Records of Source Protection Zones within Confined Aquifer	None within a 250m radius.
Records of Groundwater Vulnerability and Soils Leaching Potential	1 record on-site and 1 record within 250m radius: On-site: Major Aquifer/High Leaching Potential (H1), 46m south: Minor Aquifer/Intermediate Leaching Potential (HJ),
Records for Environment Agency Information on River Quality	None within a 250m radius.
Records for Detailed River Network entries	None within a 250m radius.
Records for surface water features	None within a 250m radius.
Flooding	
Records for Environment Agency indicative Zone 2 floodplain	None within a 250m radius.
Records for Environment Agency indicative Zone 3 floodplain	None within a 250m radius.
What is the Risk of Flooding from Rivers and the Sea (RoFRaS) Rating for the Site	Very low
Records for Flood Defences	None within a 250m radius.
Records for Areas Benefiting from Flood Defences	None within a 250m radius.
Records for Areas Used for Flood Storage	None within a 250m radius.
Are there any British Geological Survey groundwater flooding susceptibility areas within 50m of the boundary of study site?	Clearwater Flooding
What is the highest susceptibility to groundwater flooding in the search area based on the underlying geological conditions?	Limited potential
What is the British Geological Survey confidence rating in this result?	High

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Environmental Significance Of Data Search Cont'd	
Source	Nearest Distance from Site/Direction/Type/Dated
Hydrogeology and Hydrology	
Designated Environmentally Sensitive Sites	
Records of Sites of Special Scientific Interest (SSSI)	None within a 250m radius.
Records of National Nature Reserves (NNR)	None within a 250m radius.
Records of Special Areas of Conservation (SAC)	None within a 250m radius.
Records of Special Protection Areas (SPA)	None within a 250m radius.
Records of Ramsar sites	None within a 250m radius.
Records of Ancient Woodland	1 off-site record within 250m radius: 219m north-west.
Records of Local Nature Reserves (LNR)	2 off-site records within a 250m radius: 75m north-east: McIlroy Park 89m south-east: Round Copse
Records of World Heritage Sites	None within a 250m radius.
Records of Environmentally Sensitive Areas	None within a 250m radius.
Records of Areas of Outstanding Natural Beauty (AONB)	None within a 250m radius.
Records of National Parks (NP)	None within a 250m radius.
Records of Nitrate Sensitive Areas	None within a 250m radius.
Records of Nitrate Vulnerable Zones	1 record on-site: On-site
Records of Greenbelt	None within a 250m radius.
Natural Hazard Findings	
Shrink-Swell Clay	Moderate hazard on-site
Landslides	Low hazard on-site
Ground Dissolution of Soluble Rocks	Moderate hazard on-site
Compressible Deposits	Negligible hazard on-site
Collapsible Deposits	Very Low hazard on-site
Running Sands	Very low hazard on-site
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 property is not in a Radon Affected Area, as less than 1% of properties are above the Action Level.
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.
Mining	
Are there any coal mining areas within 75m of the site boundary?	No
Are there any non-coal mining areas within 50m of the site boundary?	1 record on-site: On-site: Chalk.
Are there any brine affected areas within 75m of the site boundary?	No

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Geological Significance Of Data Search	
Artificial Ground	
Are there any records of Artificial/Made Ground with 500m of the site boundary	3 off-site records within 250m radius: 79m south: Worked Ground. 162m west: Worked Ground. 170m north-east: Worked Ground.
Are there any records relating to permeability of artificial ground within the study site boundary?	None within a 250m radius.
Superficial Deposits and Landslips	
Records of Superficial Deposits/Drift Geology	2 off-site records within 250m radius: 46m south: Head Deposit. 128m north-east: Black Park Gravel Member.
Are there any records relating to permeability of superficial ground within the study site boundary?	46m south: Intergranular flow, very high permeability.
Are there any records of landslip within a 500m radius	No.
Are there any records relating to permeability of landslips within the study site boundary?	No.
Bedrock, Solid Geology & Faults	
Records of Bedrock/Solid Geology	1 on-site and 1 off-site record within 250m radius: On-site: Lambeth Group. 28m north-east: Seaford Chalk Formation.
Are there any records relating to permeability of bedrock ground within 500m of the study site boundary?	On-site: Mixed flow; very low to Moderate permeability, 28m north-east: Fracture flow type; very high permeability.
Records of Faults	None within a 250m radius.
Radon	
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 property is not in a Radon Affected Area, as less than 1% of properties are above the Action Level.
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.
Ground Workings	
Historical Surface Ground Working Features from small scale mapping	24 off-site records within 250m radius: 1 x Gravel pit 36m north-east (1901), 1 x Unspecified ground workings 47m west (1901), 1 x Clay pit 74m south-west (1960), 2 x Unspecified ground workings 122m south (1932 – 1938), 1 x Old gravel pit 150m north west (1897), 6 x unspecified pit 158-173m north-east (1910 – 1991), 2 x Old chalk pit 165-168m north-east (1900) 2 x Clay pit 165 – 187m south-west (1932 – 1960), 1 x Sand pit 170m north-east (1960), 1 x Unspecified pit 208m south (1960), 4 x Unspecified ground workings 208 – 247m west – south-west 1 x Pond 220m south-west (1901), 2 x brick, tile kiln and pottery works 240m (1878 – 1910).
Historical Underground Working Features from small scale mapping	None within a 250m radius.
BGS Current Ground Workings	4 off-site records within a 250m radius: 170m north-west: Gipsy Lane Gravel Pit – Chalk, 175m north-east: Beecham Hill Chalk Pit – Sand and Gravel, 194m south: Hill Top Quarry – Clay and shale, 230m west: Kew kiln – Clay and shale.

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Geological Significance Of Data Search (cont'd)	
Source	Nearest Distance from Site/Dated/Type
Mining, Extraction & Natural Cavities	
Historical Mining areas	None within a 250m radius.
Coal Mining areas	None within a 250m radius.
Are there any JPB Mining areas within 1000m of the study site boundary?	None within a 250m radius.
Non-Coal Mining areas	1 on-site and 1 off-site record within a 250m radius: On-site: Chalk 182m west: Chalk.
Non-Coal Mining cavities	1 off-site record within 250m radius: 190m south-west – Worked Ground.
Natural Cavities	None within a 250m radius.
Brine Extraction areas	None within a 250m radius.
Gypsum Extraction areas	None within a 250m radius.
Tin Mining areas	None within a 250m radius.
Clay Mining areas	None within a 250m radius.
Natural Hazard Findings	
Shrink-Swell Clay	On-site: Moderate hazard, 28m north-east: Negligible hazard
Landslides	Onsite: Low hazard On-site: Very low hazard 28m north-east: Negligible hazard.
Ground Dissolution of Soluble Rocks	On-site: Low hazard 28m north-east: Moderate hazard 41m south-west: Negligible hazard.
Compressible Deposits	On-site: Negligible hazard.
Collapsible Deposits	On-site: Very low hazard.
Running Sands	On-site: Very low hazard, 28m north-east: Negligible.
Borehole Records	
BGS recorded boreholes	9 off-site records within 250m radius. 96m south 127m west 147m south 153m south-west 168m west 194m south-east 218m south-west 247m south 249m south
Estimated Background Soil Chemistry	
Records of background estimated soil chemistry	1 records on-site and 2 off-site records within 250m radius: On-site (x5): <15 mg/kg (Arsenic), <1.8 mg/kg (cadmium), 60 – 90 mg/kg (chromium), 15 – 30 mg/kg (Nickel) and <100 mg/kg (lead). 28m north-east and 46m south: <15 mg/kg (Arsenic), <1.8 mg/kg (cadmium), 60 – 90 mg/kg (chromium), 15 – 30 mg/kg (Nickel) and <100 mg/kg (lead).
Railways and Tunnels	
Tunnel records	None within a 250m radius
Historical Railway and Tunnel Feature records	1 record on-site: Railway sidings: 146m west
Historical Railways records	None within a 250m radius
Active Railways records	None within a 250m radius
Railway Project records	None within a 250m radius

5.0 PLANNING DATABASE AND ONLINE REVIEW

5.1 Online Planning Database

A review of the Reading Council Planning Database revealed did not reveal any planning applications filed for the site.

5.2 Previous Investigations

Ground and Water were not aware of any previous investigations on the site.

5.3 BGS Borehole Geoindex

A BGS borehole in similar geology ~200m west of the site revealed 6.10m of loam and sand with flints. Chalk with flints was then proved to a depth of 56.70m bgl.

5.4 Internet Search

An internet search revealed no information relevant to this Desk Study.

Beecham Hill Historical Landfill was noted ~220m north-east of the site. The landfill accepted both inert and industrial waste.

6.0 SUMMARY OF FINDINGS

The findings of the Phase 1 Desk Study are summarised below and overpage:

Current Site Use:

The site comprised an approximately 500m² square shaped plot of land, located on the northern side of Gipsy Lane, to the east of Portmeirion Gardens, and to the rear of 246 – 250 Rodway Road. The site was located to the south-west of Mcllory Park in Tilehurst, north-west Reading.

At the time of the Site Walkover, April 2017, the site was occupied by two single storey brick and breeze block built residential type structures. A caravan was also present in the centre of the site. A small ~2m high wooden hut, used for wood storage, was noted in the western portion of the site.

Generally the site was used as a storage area for various household and commercial materials/waste. An area of burnt materials, and oil drums used for burning within, were noted in the northern portion of the site. Metal fragments, brake discs and car batteries were noted in the central portion of the site. Car batteries and metal fragments were also noted in the southern portion of the site. In the western portion of the site tyres were noted.

A moderate downward slope (to north) was noted in the southern portion of the site. The slope steepened in the northern portion.

A ~5.0 – 7.0m high Rhododendron was noted in the north-western corner of the site. Grassland was noted in the north portion of the site. Potential Japanese Knotweed noted in northern portion of the site. A ~3m high hedgerow was noted along the eastern portion of the site.

No evidence for shallow or deep slope instability was noted during the Site Walkover. However, some of the small stockpiles of man-made debris were showing signs of creep due to excessive stockpiling.

Current Use of Site's Environs:

Residential properties were noted directly north of the site, associated with Rodway Road running east to west. Additional residential properties associated with Portmeirion Gardens were noted ~20-100m west of the site. Various residential properties were noted ~50m - >250m south-west – south-east of the site.

Rodway Road, ~50m north of the site, was generally flat and sloping in a south-easterly direction. Rodway Road was positioned in a valley with sloping valley sides to the north and south. The site was located on the southern valley side associated with Rodway Road, sloping in a north-easterly direction.

A ~12m high tree was noted in the north-western portion of the site. ~15-18m high trees were noted directly west/south-west/north-west of the site. Mature trees, shrubs and bushes were noted along the footpath to the south.

Geology and Radon:

The BGS Geological Map (Solid and Drift) for the Tilehurst area (Reading Sheet No. 268) revealed that the site was underlain by bedrock deposits of the Lambeth Group overlying the Undifferentiated Seafood Chalk Formation and Newhaven Chalk Formation. An area of Head Deposits were shown ~50m south of the site and a capping of the Black Park Gravel Member was shown ~125m to the north. An expanse of Worked Ground was noted ~100m south and ~150m

south-west of the site.

A BGS borehole in similar geology ~200m west of the site revealed 6.10m of loam and sand with flints. Chalk with flints was then proved to a depth of 56.70m bgl.

An expanse of Worked Ground was noted ~100m south and ~150m south-west of the site.

BRE 211 (2015) Map 4 of Hampshire, Berkshire and south Oxfordshire revealed the site was not located within an area where mandatory protection measures against the ingress of Radon were likely to be required. The site was not located within an area where a risk assessment was required.

Hydrogeology and Hydrology:

The Desk Study revealed the site to be underlain by a **Secondary (A) Aquifer** relating to the bedrock deposits of the Lambeth Group. The underlying bedrock deposits of the Undifferentiated Seaford Chalk Formation and Newhaven Chalk Formation were classed as a **Principal Aquifer**. No designation was given to superficial deposits due to their likely absence. The area of Head Deposits ~50m south of the site and the capping of the Black Park Gravel Member ~125m to the north were both classified as a **Secondary a Aquifer**.

Examination of the Environment Agency records showed that the site **was not** located within a Groundwater Source Protection Zone (SPZ) as classified in the Policy and Practice for the Protection of Groundwater. The nearest such feature was to the north-west, associated with Purley on Thames.

The nearest surface water feature was the River Thames ~300m north / north-east of the site, flowing in an easterly direction.

From analysis of hydrogeological and topographical maps groundwater may be anticipated at moderate depth (5 – 7m bgl) within the Lambeth Group and then at depth (>10.00m bgl) within the underlying Chalk. It was considered that shallower groundwater was likely to be flowing in an overall north-easterly direction, with topography down slope. On reaching the base of the valley, groundwater will likely then flow south-east. Deep groundwater in the chalk may flow north-west towards a Groundwater Source Protection Zone.

Examination of the Environment Agency records showed that the site fell within a Flood Zone 1 (an area with a low probability of river or sea flooding).

Historical Land-Use of Site:

The study of the earliest historical map with available data (1877 – 1882 historical map) revealed that the site comprised open undeveloped land with a line of trees running along the southern boundary of the site, alongside Gypsy Lane.

No changes occurred until the 1960s (1961 and 1967 – 1971 historical maps) when areas of embanked land were noted along the northern and southern boundaries of the site, and immediately to the west. In the 1967 – 1971 historical map a rear garden, associated with a property directly north of the site, extended into the north-eastern portion of the site.

There were no significant changes noted from an examination of the subsequent maps to the present day.

Historical Land-Use of the Site's Environs:

The study of the earliest historical map (1877 - 1881 historic map) revealed the area in which the site was located comprised open undeveloped farmland/fields directly adjacent to the site to ~100m north, ~120m east, >250m south and ~240m west. Kentwood Grove was noted ~90m north-east to ~180m north-west, running in a south-easterly to north-westerly direction. A road labelled as Gipsy Lane was noted directly south of the site, running in a west to east direction. A chalk pit was noted ~160m north-east of the site. Round Copse was noted ~110 - >250m south-east of the site, Kentwood kiln was noted ~250m west of the site. An old Gravel pit was noted ~150m north-west of the site.

The chalk pit noted ~160m north-east of the site was labelled old chalk pit in the 1897 historical map.

Towards the early 1900s (1910 and 1932 – 1934 historical map) Kentwood Kiln noted ~250m west of the site was no longer present and had been replaced with a pumping station. Kew Kiln was established ~160 – 250m west of the site. In the 1932 – 1934 historical map a clay pit was noted ~110 – 250m south of the site, an unlabelled structure was noted ~160m south-west of the site and an area of embanked land was noted ~230 - >250m west of the site. Embanked land associated with the gravel pit ~150m north-west was still noted.

In the 1936 historical map an orchard was noted ~220 – 250m north of the site. A sand pit was noted ~240 - >250m north-east of the site. The former chalk pit noted ~160m north-east of the site was re-opened as a gravel pit. The area of stepped land associated with the former gravel pit ~150m north-west was no longer present.

Towards the 1960s (1960 – 1961, 1961 and 1967 – 1971 historical maps) residential development had occurred directly north, east and ~80->250m west of the site. The unlabelled structure noted ~160m south-west of the site was no longer present. An additional clay pit was noted ~120->250m south-west of the site. A large works was noted ~250m west of the site.

In the 1961 historical map multiple areas of embanked land were noted directly east and west, and ~100 - >250m to the west to south. Ponds were noted ~160m south-east and ~230m south-west. The sand / gravel pit noted ~160m north-west was no longer labelled. Allotment gardens were noted ~120 -160m and ~170 – 250m north-west of the site. Embanked land associated with Rodway Road and Vale Crescent, into the existing slope, was present to the north and north-west. In the 1967 – 1971 historical map the allotment noted ~170m – 250m north-west of the site was converted to garages.

Towards the late 1900s (1976, 1978 – 1982, 1982 -1983 and 1988 – 1993 historical maps) the clay pits and ponds noted ~100->250m south – south-west of the site were redeveloped into residential housing. Electricity sub-stations were noted ~180m west and ~90m south of the site.

There were no significant changes noted from an examination of the subsequent maps to the present day.

The Groundsure Datasheets:

The Groundsure Environmental and Geological Datasheets, presented in Appendix D of this report, revealed the following information which may be pertinent to this Desk Study.

Thirty-eight off-site records of potentially contaminative historical uses were recorded within a

250m radius of the site comprising: 1 x Unspecified kiln 28m west (1901), 1 x Gravel pit 36m north-west (1901), 1 x Unspecified commercial / Industrial 47m west (1901), 1 x Unspecified ground workings 47m west (1901), 1 x Clay pit 74m south-west (1960), 2 x Unspecified ground workings 122m (x2) south (1932 – 1938), 1 x Railway sidings 146m west (1901), 2 x Old gravel pit 150 – 151m north west – west (1900), 1 x Unspecified kiln 152m west (1878), 6 x Unspecified pit 158 - 173 north-east (1910 – 1991), 2 x Old chalk pit 159 – 168m north-east (1900), 3 x Clay pit 165 – 187m south – south-west (1932 – 1960), 1 x Unspecified works 198m west (1960), 3 x Unspecified ground workings 208 – 213m (1901 – 1938), 1 x Unspecified kiln 236m west (1900), 3 x Pumping station 236m (x3) west (1900 – 1938), 2 x Brick work, tile kiln and pottery works 240m (x2) west (1878 – 1910), 2 x Unspecified commercial / industrial 241 – 247m west (1900), 1 x Unspecified ground workings 247m west (1900), 1 x Unspecified kiln 250m west (1900).

Six off-site records of historical energy features were recorded within a 250m radius of the site comprising: 3 x Electricity sub-station 81m south (1978 – 1993), 3 x Electricity sub-station 164 west (1979 – 1993).

Twenty-six off-site records of potentially infilled land were recorded within a 250m radius of the site comprising: 1 x Gravel pit 36m north-east (1901), 1 x Unspecified ground workings 47m west (1901), 1 x Clay pit 74m south-west (1960), 2 x Unspecified ground workings 122m south (1932 – 1938), 2 x Old gravel pit 150 – 151m north west – west (1900), 6 X unspecified pit 158-173m north-east (1910 – 1991), 2 x Old chalk pit 165-168m north-east (1900), 3 x Clay pit 165 – 187m south-west (1932 – 1960), 1 x Sand pit 170m north-east (1960), 1 x Unspecified pit 208m south (1960), 4 x Unspecified ground workings 208 – 247m west – south-west, 1 x Pond 220m south-west (1901), 2 x brick, tile kiln and pottery works 240m (1878 – 1910).

Two off-site records of current industrial sites were recorded within a 250m radius of the site comprising: 1 x Electrical features 84m south, 1 x Electrical features 182m west.

Beecham Hill Historical Landfill was noted ~220m north-east of the site. The landfill accepted both inert and industrial waste.

Proposed Development:

At the time of reporting, June 2017, the exact nature of the proposed development was not known. However, the redevelopment was likely to comprise demolition of the existing structures and construction of residential flats/houses with communal/private garden areas, parking and site access.

7.0 PHASE 1 RISK ASSESSMENT

7.1 Conceptual Site Model

A tabular Conceptual Site Model (CSM) for the site can be seen in Section 7.8 of this report. A diagrammatic representation of the model can be seen in Figure 6 of this report.

7.2 Contaminant Source-Pathway-Receptor Model

For an environmental risk to be present there must be a source of contamination, a receptor or receptors, and a pathway for contaminants to migrate or be absorbed. Where a pathway exists between the source and receptor then it is called a “pollutant linkage”.

7.3 Potential On-site Sources of Contaminants

The Phase 1 Desk Study revealed the following potential on-site sources of contamination:

- During the Site Walkover waste materials were noted, including;
 - The **northern portion** of the site was covered by the following: area of burnt materials / oil drums used for burning waste within; trampoline / slide, digger / JCB, and pond.
 - The **eastern portion** of the site was covered by the following: paved walkway, single storey brick and breeze block built residential type structure.
 - The **central portion** of the site was covered by the following: single storey brick and breeze block built residential type structure; caravan; small vegetable patch; metal fragments; scaffolding; butane canisters; outdoor kitchen; cooking oils; car batteries; brake discs and brakes.
 - The **southern portion** of the site was covered by the following: washing machines, car batteries, butane canisters; plant pots; metal fragments; wood fragments and plastic.
 - The **western portion** of the site was covered by the following: plastic bottles; metal fragments, wood fragments; wood storage hut; glass / glass fragments; concrete fragments; brick fragments and tyres.

Contaminants associated with such materials could include metals, semi-metals, oil/fuel hydrocarbons, PAHs, solvents and inorganic chemicals (R&D Publication CLR 8, 2002). Isolated leaks and spillages may have occurred. Any leaks were generally likely to have been of low volume and low frequency. As such the risk of significant leaks/spills affecting the soil or groundwater quality underlying the site was considered to be **low**.

- The study of the earliest historical map with available data (1877 – 1882 historical map) revealed that the site comprised open undeveloped land with a line of trees running along the southern boundary of the site, alongside Gypsy Lane.

No changes occurred until the 1960s (1961 and 1967 – 1971 historical maps) when areas of embanked land were noted along the northern and southern boundaries of the site, and immediately west. In the 1967 – 1971 historical map a rear garden, associated with a property directly north of the site, spanned in the north-eastern portion of the site.

The embanked land noted in the 1961 historic map indicated possible deep Made Ground onsite. The Made Ground may have contained organic materials which could be a source of ground gas, however the overall risk was considered to be low. Contaminants including heavy metals and PAH's may be present within the potential Made Ground.

7.4 Potential Off-site Sources of Contaminants

The Phase 1 Desk Study revealed the following potential off-site sources of contamination:

- In the 1877 – 1881 historical map a chalk pit was noted ~160m north-east and an old gravel pit was noted ~150m north-west of the site. The chalk pit became a gravel / sand pit in the 1936 historical map, and was extended. The old gravel pit was later infilled on the 1936 historical map. The sand / gravel pit noted ~160m north-east of the site was infilled in the 1961 historic map.

A large clay pit was present ~110 – 250m south of the site in the 1932 – 1934 historic map, this was later extended ~120 – 250m south-east of the site in the 1960 – 1961 historical map. In addition, two ponds were noted ~160m south-east and ~230m south-west of the site in the 1961 historic map. The clay pits and ponds noted to the south of the site were no longer present in the 1976 historical map, infilling occurred in the 1978 -1982 historical map.

The GroundSure Datasheets recorded sixteen records of potentially infilled land within a 250m radius of the site comprising: 1 x Gravel pit 36m north-east (1901), 1 x Unspecified ground workings 47m west (1901), 1 x Clay pit 74m south-west (1960), 2 x Unspecified ground workings 122m south (1932 – 1938), 2 x Old gravel pit 150 – 151m north west – west (1900), 6 X unspecified pit 158-173m north-east (1910 – 1991), 2 x Old chalk pit 165-168m north-east (1900), 3 x Clay pit 165 – 187m south-west (1932 – 1960), 1 x Sand pit 170m north-east (1960), 1 x Unspecified pit 208m south (1960), 4 x Unspecified ground workings 208 – 247m west – south-west, 1 x Pond 220m south-west (1901), 2 x brick, tile kiln and pottery works 240m (1878 – 1910).

An expanse of Worked Ground was noted ~100m south and ~150m south-west of the site. This was considered to be associated with the clay pits noted south of the site, within the historical maps.

The historical chalk pits, sand pits and gravel pits recorded may have had parts backfilled with putrescible fill, which in turn could be generating harmful bio-gases, such as methane and carbon dioxide. However, due to the distance from the site, the relatively small potentially infilled area and predominantly the age of the backfill, the overall risk of ground gas to have been produced and migrated towards the site was considered to be **negligible**.

The historical clay pits and ponds recorded to the south of the site were potentially backfilled between 1978 – 1982. It was considered that the risk of significant quantities of potential ground-gases affecting the site was **low to medium**, therefore this **source cannot be discounted**.

- In the 1936 historical map an orchard was noted ~220 – 250m north of the site. Allotment gardens were noted ~120 - 160m and ~170 – 250m north-west of the site in the 1961 historical map. By the 1967 – 1971 historical map one of the allotments noted ~170 – 250m north-west of the site was converted to garages.

Sporadic use of pesticides and herbicides may have occurred within the allotment; however, given the small-scale nature of the allotment, any residue pesticides/herbicides are likely to have been attenuated. Fill from the allotments was considered unlikely to have been imported to site and therefore these features were considered to be a **negligible** risk with respect to contamination.

- In the 1961 historical map multiple areas of embanked land were noted along Gipsy Lane, directly east and west, ~50m north-west and north-east, ~100->250m west and ~110 - >250m north-west of the site.

The embanked land was due to the topography of the surrounding land and the residential properties, cut into existing slopes. As a result the risk of any significant quantities of Made Ground being present which could potentially generate ground-gases that could affect the site was considered to be **low** given that the primary pathway for ground-gas to migrate will be to surface. This source has therefore been **discounted**.

- The Groundsure Datasheets presented in Appendix D of this report revealed thirty-eight off-site records of potentially contaminative historical uses were recorded within a 250m radius of the site including: 1 x Unspecified kiln 28m west (1901), 1 x Gravel pit 36m north-west (1901), 1 x Unspecified commercial / Industrial 47m west (1901), 1 x Unspecified ground workings 47m west (1901), 1 x Clay pit 74m south-west (1960), 2 x Unspecified ground workings 122m (x2) south (1932 – 1938), 1 x Railway sidings 146m west (1901), 2 x Old gravel pit 150 – 151m north west – west (1900), 1 x Unspecified kiln 152m west (1878), 6 x Unspecified pit 158 - 173 north-east (1910 – 1991), 2 x Old chalk pit 159 – 168m north-east (1900), 3 x Clay pit 165 – 187m south – south-west (1932 – 1960), 1 x Unspecified works 198m west (1960), 3 x Unspecified ground workings 208 – 213m (1901 – 1938), 1 x Unspecified kiln 236m west (1900), 3 x Pumping station 236m (x3) west (1900 – 1938), 2 x Brick work, tile kiln and pottery works 240m (x2) west (1878 – 1910), 2 x Unspecified commercial / industrial 241 – 247m west (1900), 1 x Unspecified ground workings 247m west (1900), 1 x Unspecified kiln 250m west (1900).

In the earliest historical maps reviewed, Kenwood Kiln was noted ~250m west of the site. Towards the early 1900s (1910 and 1932 – 1934 historical map) Kentwood Kiln was no longer present and had been replaced with a pumping station. In the 1961 historical map a works was noted ~250m west of the site.

Contaminants associated with such industrial works and activities could include metals and semi-metals; asbestos; oil/fuel hydrocarbons, PAHs, solvents and inorganic chemicals (R&D Publication CLR 8, 2002). Fill imported to site from such industries may have contained such materials; however, attenuation of volatile hydrocarbons during excavation, transport and deposition is likely. Given that the buildings on the site have had very limited changes/alterations in their layout and configuration and site levels do not appear to have been raised, the likelihood of fill having been imported to the site was considered to be **low**.

- In the 1978 – 1982 historical map an electricity sub-station was noted ~180m west of the site. An additional electricity sub-station was noted ~90m south of the site in the 1983 – 1987 historical map.

The GroundSure datasheets revealed seven records of historical energy features within a

250m radius of the site including: 3 x Electricity sub-station 81m south (1978 – 1993), 3 x Electricity sub-station 164 west (1979 – 1993).

The Groundsure Datasheets presented in appendix D of this report revealed six off-site records of potentially contaminative uses were recorded within a 250m radius of the site comprising: 1 x electricity sub-station 84m south, 1 x electricity sub-station 182m west.

High-voltage electricity substations may be a potential source for Polychlorinated Biphenyls (PCBs), especially in pre-1970's sub-stations. PCB oils and other cable/transformer oils, together with a series of waxes are commonly used in mainly high voltage applications. PCBs are generally toxic; however, newer (post-1970's) forms of non-toxic oils and waxes have replaced the use of PCBs. All cable oils are extremely viscous and adhere strongly to soil particles and do not tend to migrate far from the point of leakage or spillage. Therefore, given the age of the electricity sub-station to the site it was concluded that the potential risk of encountering PCBs on the site is **negligible**.

- Beecham Hill Historical Landfill was noted ~220m north-east of the site. The landfill accepted both inert and industrial waste. The landfill was considered to comprise a source of ground gas, which may migrate into the site. The overall risk for the site was considered to be **low**, due to the distance of the landfill from the site.

7.5 Potential Pathways for Contaminant Migration from Off-site Sources

Anthropogenic (or artificial) pathways for contaminant migration can be present in the form of land drains etc. Leaking sewage supply pipes and site drainage could also provide pathways for potential contaminant migration. Granular backfill to trenches for cables, gas pipes, water pipes etc. can also provide pathways for movement of mobile contaminants and contaminated groundwater.

The BGS Geological Map (Solid and Drift) for the Tilehurst area (Reading Sheet No. 268) revealed that the site was underlain by bedrock deposits of the Lambeth Group overlying the Undifferentiated Seaford Chalk Formation and Newhaven Chalk Formation. An area of Head Deposits were shown ~50m south of the site and a capping of the Black Park Gravel Member was shown ~125m to the north. An expanse of Worked Ground was noted ~100m south and ~150m south-west of the site.

A BGS borehole in similar geology ~200m west of the site revealed 6.10m of loam and sand with flints. Chalk with flints was then proved to a depth of 56.70m bgl.

BRE 211 (2015) Map 4 of Hampshire, Berkshire and south Oxfordshire revealed the site was not located within an area where mandatory protection measures against the ingress of Radon were likely to be required. The site was not located within an area where a risk assessment was required.

The bedrock deposits of the Lambeth Group and the Undifferentiated Seaford Chalk Formation and Newhaven Chalk Formation may act as a potential pathway for contaminants/ground-gas to migrate towards the site due to their low to medium mixed and very high fracture controlled permeability respectively.

Any potential Made Ground soils are also likely to act as a migration pathway for contaminants. Surface water runoff of contaminants is a potential migration pathway.

7.6 Potential Receptors

Human Health

At the time of reporting, June 2017, the exact nature of the proposed development was not known. However, the redevelopment was likely to comprise demolition of the existing structures and construction of residential flats/houses with communal/private garden areas, parking and site access.

The potential receptors are presented below and comprise:

- End users of the site (Residents)
- Site operatives during demolition and redevelopment;
- Maintenance workers;
- Building materials and services.

Groundwater

The Desk Study revealed the site to be underlain by a **Secondary (A) Aquifer** relating to the bedrock deposits of the Lambeth Group. The underlying bedrock deposits of the Undifferentiated Seaford Chalk Formation and Newhaven Chalk Formation were classed as a **Principal Aquifer**. No designation was given to superficial deposits due to their likely absence. The area of Head Deposits ~50m south of the site and the capping of the Black Park Gravel Member ~125m to the north were both classified as a **Secondary a Aquifer**.

Examination of the Environment Agency records showed that the site **was not** located within a Groundwater Source Protection Zone (SPZ) as classified in the Policy and Practice for the Protection of Groundwater. The nearest such feature was to the north-west, associated with Purley on Thames.

The nearest surface water feature was the River Thames ~300m north / north-east of the site, flowing in an easterly direction.

From analysis of hydrogeological and topographical maps groundwater may be anticipated at moderate depth (5 – 7m bgl) within the Lambeth Group and then at depth (>10.00m bgl) within the underlying Chalk. It was considered that shallower groundwater was likely to be flowing in an overall north-easterly direction, with topography down slope. On reaching the base of the valley, groundwater will likely then flow south-east. Deep groundwater in the chalk may flow north-west towards a Groundwater Source Protection Zone.

Examination of the Environment Agency records showed that the site fell within a Flood Zone 1 (an area with a low probability of river or sea flooding).

The Secondary (A) Aquifer and Principal Aquifer underlying the site were considered to be sensitive receptors.

7.7 Contaminant Absorption Pathways

At the time of reporting, June 2017, the exact nature of the proposed development was not known. However, the redevelopment was likely to comprise demolition of the existing structures and construction of residential flats/houses with communal/private garden areas, parking and site access.

The potential pathways for contaminant absorption by receptors are as follows:

Human Health: Residential Houses with Private Gardens: **Soil Contamination**

- Direct ingestion of soil and soil derived dust;
- Dermal contact of soil and soil derived dust;
- Ingestion of soil with elevated concentration of determinants;
- Dermal contact with impacted soils;
- Consumption of home grown vegetables;
- Direct ingestion of soil attached to vegetables;
- Inhalation of impacted dust (indoors and outdoors) with elevated concentration of determinants;
- Inhalation of volatile vapours (indoors and outdoors) with elevated concentration of determinants.

Building materials and services:

- Direct contact with aggressive ground conditions

Groundwater:

- Surface water runoff;
- Via anthropogenic pathways.
- Via Made Ground and the natural soils of the Lambeth Group and Undifferentiated Seaford Chalk Formation and Newhaven Chalk Formation.

Ground-gas

- Via anthropogenic pathways.
- Via Made Ground and the natural soils of the Lambeth Group/ Undifferentiated Seaford Chalk Formation and Newhaven Chalk Formation.

7.8 Tabulated Conceptual Site Model

The tabulated Conceptual Site Model developed by this Desk Study can be seen overleaf.

Tabulated Conceptual Site Model – Plausible Pollutant Linkages Only		
Potential On-site Sources	Potential Absorption Pathways	Potential Receptors
Contaminants introduced on-site by historic construction activities. Deep Made Ground may also be present within the embanked land historically noted onsite. Contaminants within scattered debris present onsite and noted during the site walkover. - Heavy metals & semi-metals (incl. Arsenic, Cadmium, Chromium, Lead etc); - Combustion products (PAH's, benzo(a)pyrene, fluoranthene, dibenz(a,h)anthracene); - Organic compounds (fuel oils, ash, tar); - Asbestos (building material, pipe lagging). - VOC's (BTEX compounds used as markers).	Direct ingestion of soil and soil derived dust; Dermal contact of soil and soil derived dust; Ingestion of soil with elevated concentration of determinants; Dermal contact with impacted soils; Inhalation of impacted dust (indoors and outdoors) with elevated concentration of determinants. Inhalation of volatiles (indoors and outdoors) with elevated concentration of determinants. Direct contact with aggressive ground conditions within Made Ground Via anthropogenic pathways; Via underlying geology; (Lambeth Group/ Undifferentiated Seaford Chalk Formation and Newhaven Chalk Formation) Via surface water.	Construction workers (particularly during foundation construction). Service and Maintenance Operatives. Site Occupiers. Building materials (e.g. concrete) and services Secondary (A) Aquifer (Lambeth Group) Principal Aquifer (Undifferentiated Seaford Chalk Formation and Newhaven Chalk Formation).
Ground-gases (Carbon Dioxide, Methane) from nearby historical infilled features (mainly the clay pits to the south). - Carbon dioxide, - Methane, - Hydrogen Sulphide; - Carbon Monoxide;	Migration through anthropogenic and natural pathways (Lambeth Group/ Undifferentiated Seaford Chalk Formation and Newhaven Chalk Formation) Inhalation Asphyxiation	Site occupiers. Buildings. Construction workers, service and maintenance operatives, especially in confined spaces.

7.9 Recommendations/Phase 2 Objectives

Human Health – Soils:

An intrusive investigation should be considered in order to determine whether or not potential contaminants of concern are present within the soils underlying the site.

On the basis of the Phase 1 Site Assessment the following contaminants of concern have been identified:

- Semi-metals and heavy metals incl. Arsenic, Cadmium, Chromium (incl. Hexavalent Chromium), Copper, Lead, Mercury, Nickel, Selenium, Vanadium, Zinc;
- Asbestos (fibrous material screen and identification if suspected material encountered);
- Polycyclic Aromatic Hydrocarbons (PAH's) incl. Naphthalene, Acenaphthylene, Acenaphthene, Fluorene, Phenanthrene, Anthracene, Fluoranthene, Pyrene,

- Benzo(a)anthracene, Chrysene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(a)pyrene, Indeno(1,2,3-cd)pyrene, Dibenz(a,h)anthracene, Benzo(ghi)perylene;
- Asbestos;
 - BTEX compounds (Benzene, Toluene, Ethylbenzene, Xylene) and MTBE – used as marker compounds for Volatile Organic Compounds (VOCs).

The list above does not imply that these chemical are present on-site or that they are likely to cause contamination issues at the site. The sampling and testing strategy must be in line with current standards.

An **Asbestos Management Strategy** should be put in place so that any potentially asbestos containing materials are identified and removed from site in a suitable manner to prevent cross-contamination.

Groundwater:

If analytical results show elevated concentrations of contaminants of concern in the soil samples then there might be a requirement to assess the potential risks of surface water runoff containing such contaminants migrating into the groundwater underlying the site. This might mean leachate testing on soils samples is required or groundwater sampling and testing.

Human Health –Ground-gases:

The Conceptual Site Model had determined that there is a risk that levels of methane and carbon dioxide may be being produced by putrescible material within the historical infilled nearby features, especially those infilled between 1978 - 1982.

Generally the primary migration pathway is considered to be through the soils of the Lambeth Group.

As a result ground-gas monitoring should be undertaken on site, with a focus on the southern part of the site.

7.10 Discovery Strategy

There may be areas of contamination that have not been identified during the course of the Desk Study. For example, there may have been underground storage tanks (UST's) not identified during the Desk Study for which there is no historical or contemporary evidence. Such occurrences may be discovered during the investigation for the redevelopment of the site.

Groundworkers should be instructed to report to the Site Manager any evidence for such contamination; this may comprise visual indicators, such as fibrous materials within the soil, discolouration, or odours and emission. Upon discovery advice must be taken from a suitably qualified person before proceeding, such that appropriate remedial measures and health and safety protection may be applied.

Should a new source of contamination be suspected or identified then the Local Authority will need to be informed.

7.11 Geotechnical Considerations

The site was underlain bedrock deposits of the Lambeth Group. No designation was given for any superficial deposits on-site due to their likely absence.

A BGS borehole in similar geology ~200m west of the site revealed 6.10m of loam and sand with flints. Chalk with flints was then proved to a depth of 56.70m bgl.

From analysis of hydrogeological and topographical maps groundwater may be anticipated at moderate depth (5 – 7m bgl) within the Lambeth Group and then at depth (>10.00m bgl) within the underlying Chalk. It was considered that shallower groundwater was likely to be flowing in an overall north-easterly direction, with topography down slope. On reaching the base of the valley, groundwater will likely then flow south-east. Deep groundwater in the chalk may flow north-west towards a Groundwater Source Protection Zone.

According to the Groundsure report, the hazard rate for landslides on site is low. No records of landslips were noted within 500m from the site within the Groundsure datasheets. A moderate hazard of shrink-swell for clay was recorded. A moderate hazard for ground dissolution of soluble rocks was noted. Very low and negligible hazard was designated for compressible deposits, collapsible deposits and running sands on site.

A moderate downward slope (to the north) was noted in the southern portion of the site, with a steep slope present in the northern portion of the site.

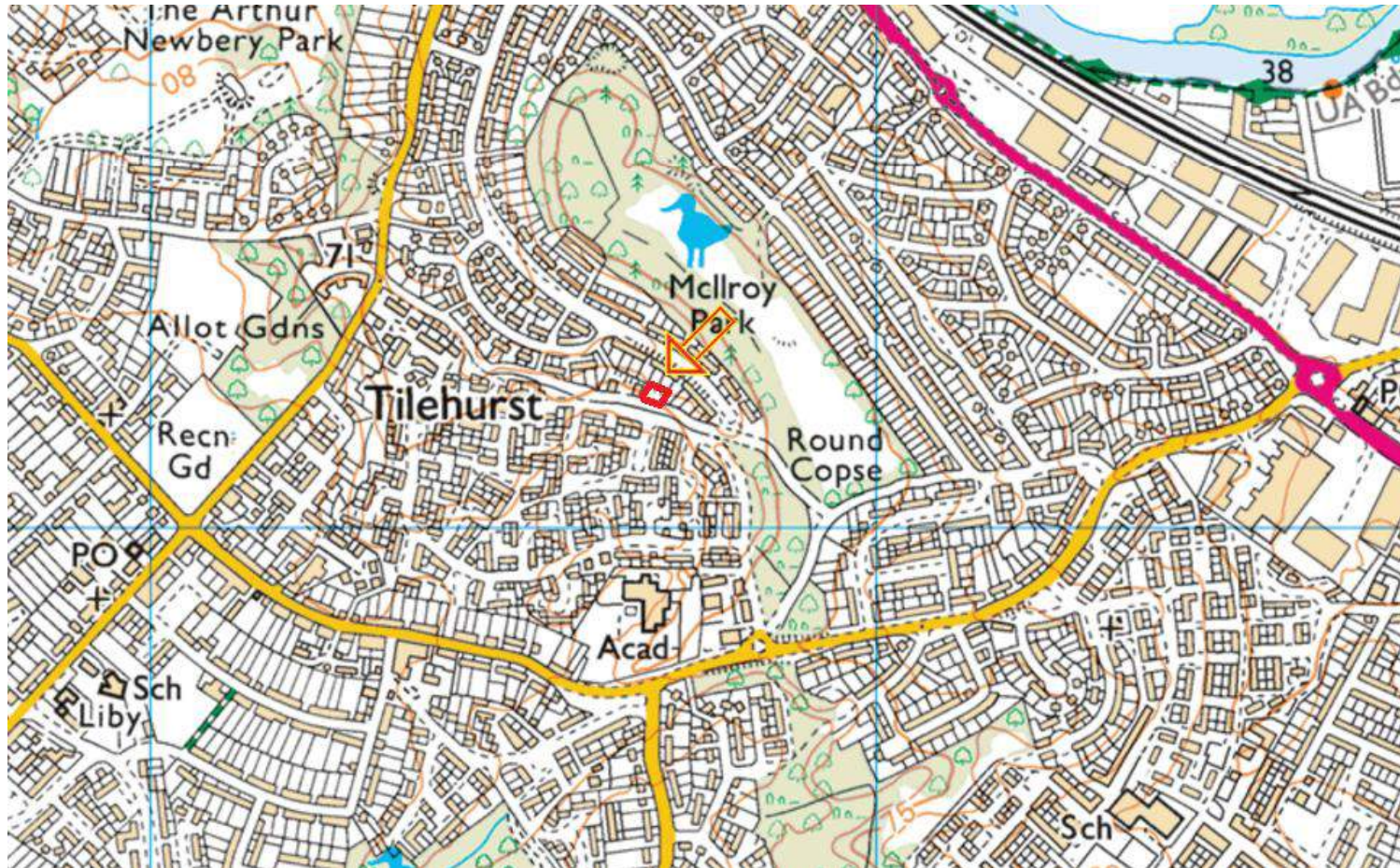
No evidence for shallow or deep slope instability was noted during the Site Walkover. However, some of the small stockpiles of man-made debris were showing signs of creep due to excessive stockpiling.

Although the general risk of ground instability on site is considered to be low, a slope stability assessment should be undertaken looking at the effect of the proposed development on the existing slope, and on the basis of the results of an intrusive ground investigation. Any affect on the slope stability caused by changes in site drainage should also be considered.

It should be also noted that a potential Japanese Knotweed, which is an invasive species, was noted in the northern portion of the site, during the Site Walkover. A specialist survey is required to confirm this. In the case of Japanese Knotweed being present, this would need to be treated by a specialist before any construction activities.

The following geotechnical concerns have been formulated by this desk based review and should be analysed by intrusive investigation:

- Soils with the potential for volume change potential may be encountered under the site. Soils volume change potential to be determined along with depth of root penetration with reference to proximity of nearby trees;
 - Potential for low undrained shear strengths in shallow soils;
 - Potential for Made Ground due to construction activities and historical embanked land;
 - Potential of slope instability, especially in the case of Made Ground being potentially present within part of the slope. However the risk is currently considered to be low.
 - Potential for shallow groundwater to be encountered perched within shallow Made Ground or within sand/silt layers of the Lambeth Group;
 - Potential for Japanese Knotweed;
 - Concrete in aggressive ground.
-



APPROXIMATE SITE BOUNDARY

NOT TO SCALE

Project:		Figure 1 ground&water
LAND AT GIPSY LANE, TILEHURST, READING, BERKSHIRE RG30 6EG		
Client:	Date:	
Alpha One Properties	June 2017	
	Ref:	
Site Location Plan	GWPR1993	



APPROXIMATE SITE BOUNDARY

NOT TO SCALE

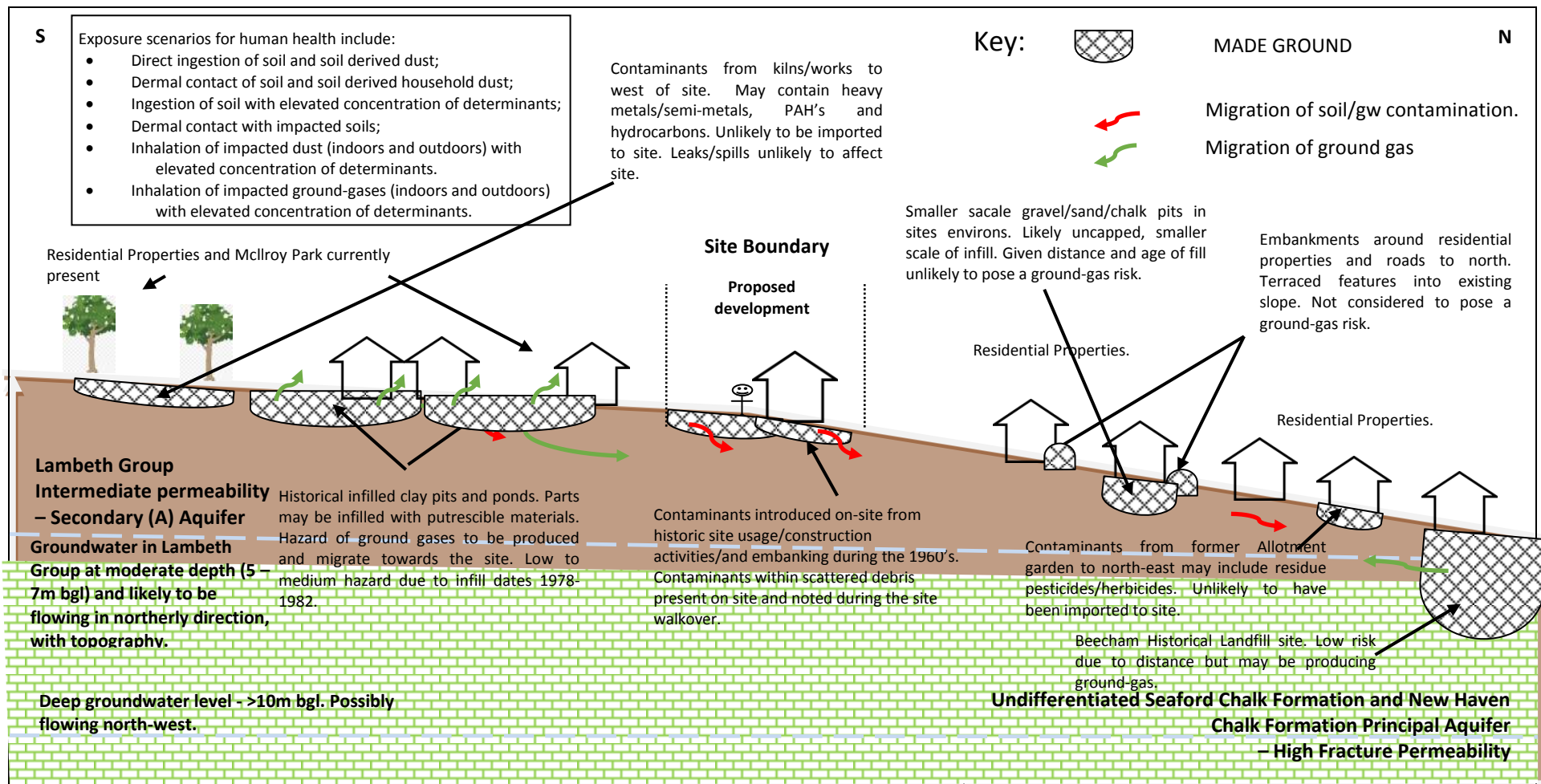
Project: LAND AT GIPSY LANE, TILEHURST, READING, BERKSHIRE RG30 6EG		Figure 2 ground&water
Client: Alpha One Properties	Date: June 2017	
Site Development Area	Ref: GWPR1993	



APPROXIMATE SITE BOUNDARY

NOT TO SCALE

Project:		Figure 3 ground&water
LAND AT GIPSY LANE, TILEHURST, READING, BERKSHIRE RG30 6EG		
Client:	Date:	
Alpha One Properties	June 2017	
	Ref:	
Aerial View of Site	GWPR1993	



Project:		Land at Gipsy Lane, Tilehurst, Reading RG30 6EG		Figure 4
Client:	Alpha One Properties	Date:	June 2017	
Diagrammatic Conceptual Site Model (Generally South to North)		Ref:	GWPR1993	

APPENDIX A

Conditions and Limitations

The ground is a product of continuing natural and artificial processes. As a result, the ground will exhibit a variety of characteristics that vary from place to place across a site, and also with time. Whilst a ground investigation will mitigate to a greater or lesser degree against the resulting risk from variation, the risks cannot be eliminated.

The report has been prepared on the basis of information, data and materials which were available at the time of writing. Accordingly any conclusions, opinions or judgements made in the report should not be regarded as definitive or relied upon to the exclusion of other information, opinions and judgements.

The investigation, interpretations, and recommendations given in this report were prepared for the sole benefit of the client in accordance with their brief; as such these do not necessarily address all aspects of ground behaviour at the site. No liability is accepted for any reliance placed on it by others unless specifically agreed in writing.

Any decisions made by you, or by any organisation, agency or person who has read, received or been provided with information contained in the report ("you" or "the Recipient") are decisions of the Recipient and we will not make, or be deemed to make, any decisions on behalf of any Recipient. We will not be liable for the consequences of any such decisions.

Current regulations and good practice were used in the preparation of this report. An appropriately qualified person must review the recommendations given in this report at the time of preparation of the scheme design to ensure that any recommendations given remain valid in light of changes in regulation and practice, or additional information obtained regarding the site.

Any Recipient must take into account any other factors apart from the Report of which they and their experts and advisers are or should be aware. The information, data, conclusions, opinions and judgements set out in the report may relate to certain contexts and may not be suitable in other contexts. It is your responsibility to ensure that you do not use the information we provide in the wrong context.

This report is based on readily available geological records, the recorded physical investigation, the strata observed in the works, together with the results of completed site and laboratory tests. Whilst skill and care has been taken to interpret these conditions likely between or below investigation points, the possibility of other characteristics not revealed cannot be discounted, for which no liability can be accepted. The impact of our assessment on other aspects of the development required evaluation by other involved parties.

The opinions expressed cannot be absolute due to the limitations of time and resources within the context of the agreed brief and the possibility of unrecorded previous in ground activities. The ground conditions have been sampled or monitored in recorded locations and tests for some of the more common chemicals generally expected. Other concentrations of types of chemicals may exist. It was not part of the scope of this report to comment on environment/contaminated land considerations.

The conclusions and recommendations relate to land at Gipsy Lane, Tilehurst, Reading, Berkshire, RG30 6EG.

Trial hole is a generic term used to describe a method of direct investigation. The term trial pit, borehole or window sampler borehole implies the specific technique used to produce a trial hole.

The depth to roots and/or of desiccation may vary from that found during the investigation. The client is responsible for establishing the depth to roots and/or of desiccation on a plot-by-plot basis prior to the construction of foundations. Where trees are mentioned in the text this means existing trees, recently removed trees (approximately 15 years to full recovery on cohesive soils) and those planned as part of the site landscaping.

Ownership of copyright of all printed material including reports, laboratory test results, trial pit and borehole log sheets, including drillers log sheets, remain with Ground and Water Limited. Licence is for the sole use of the client and may not be assigned, transferred or given to a third party.

Recipients are not permitted to publish this report outside of their organisation without our express written consent.

APPENDIX B
Site Photographs

Photograph 1: View towards site from Pottery Road. View looking north-east.



Photograph 2: View of access to site from Portmeirion Gardens (view looking south-east).



Project:

Land at Gipsy Lane, Tilehurst, Reading, RG30 6EG

Client:

Alpha One Properties

Date:

June 2017

Appendix B: Site Photographs

Ref:

GWPR1993

Plate 1

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Photographs 3: View of site entrance off Gypsy Lane.



Photographs 4: View towards the residential houses of 248 – 250 Rodway Road, view looking south-west. Site is located behind the properties.



Project:

Land at Gypsy Lane, Tilehurst, Reading, RG30 6EG

Client:

Alpha One Properties

Date:

June 2017

Appendix B: Site Photographs

Ref:

GWPR1993

Plate 2

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Photographs 5: View of stored materials/waste onsite.



Photographs 6: View of bonfire area in northern portion of site.



Project:
Land at Gipsy Lane, Tilehurst, Reading, RG30 6EG

Client:
Alpha One Properties

Date:
June 2017

Appendix B: Site Photographs

Ref:
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Plate 3

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Photographs 7: View of steepening slope beyond the northern boundary of site, looking towards the rear gardens of Rodway Road. View looking north-east.



Photographs 8: View of stockpile of plastic water bottles in western portion of the site.



Project:
Land at Gipsy Lane, Tilehurst, Reading, RG30 6EG

Client:
Alpha One Properties

Date:
June 2017

Appendix B: Site Photographs

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GWPR1993

Plate 4

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Photographs 9: View of western boundary of site and stockpile of tyres.



Photographs 10: View of western boundary of site and stockpile of tyres.



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Client:
Alpha One Properties

Date:
June 2017

Appendix B: Site Photographs

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Plate 5

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Photographs 11: View inside wooden hut used for wood storage in western portion of the site.



Photographs 12: View of stockpiled materials onsite and site boundary.



Project:

Land at Gipsy Lane, Tilehurst, Reading, RG30 6EG

Client:

Alpha One Properties

Date:

June 2017

Appendix B: Site Photographs

Ref:

GWPR1993

Plate 6

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Photographs 13: View of stockpiled materials/waste onsite.



Photographs 14: View of stockpiled materials/waste onsite.



Project:

Land at Gipsy Lane, Tilehurst, Reading, RG30 6EG

Client:

Alpha One Properties

Date:

June 2017

Appendix B: Site Photographs

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GWPR1993

Plate 7

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Photographs 15: View of small 1.8t digger in northern portion of the site.



Photographs 16: View of tall trees just beyond north-west corner of site. View looking west.



Project:
Land at Gipsy Lane, Tilehurst, Reading, RG30 6EG

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Alpha One Properties

Date:
June 2017

Appendix B: Site Photographs

Ref:
GWPR1993

Plate 8

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Photographs 17: View of possible Japanese knotweed possibly present onsite.



Photographs 18: View of northern site boundary. View looking north-east.



Project:

Land at Gipsy Lane, Tilehurst, Reading, RG30 6EG

Client:

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Date:

June 2017

Appendix B: Site Photographs

Ref:

GWPR1993

Plate 9

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Photographs 19: View of metal bin used to burn waste materials on northern boundary.



Photographs 20: View of stockpiled materials/waste onsite.



Project:

Land at Gipsy Lane, Tilehurst, Reading, RG30 6EG

Client:

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Date:

June 2017

Appendix B: Site Photographs

Ref:

GWPR1993

Plate 10

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Photographs 21: View of small vegetable patch onsite.



Photographs 22: View of gas canister present onsite.



Project:

Land at Gipsy Lane, Tilehurst, Reading, RG30 6EG

Client:

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Date:

June 2017

Appendix B: Site Photographs

Ref:

GWPR1993

Plate 11

ground&water

Photographs 23: View of northern portion of site. View looking west.



Photographs 24: View of north-east corner of site. View looking north.



Project:

Land at Gipsy Lane, Tilehurst, Reading, RG30 6EG

Client:

Alpha One Properties

Date:

June 2017

Appendix B: Site Photographs

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GWPR1993

Plate 12

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Photographs 25: View of pond in north-east corner of site.



Photographs 26: View from north-east corner looking south.



Project:

Land at Gipsy Lane, Tilehurst, Reading, RG30 6EG

Client:

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Date:

June 2017

Appendix B: Site Photographs

Ref:

GWPR1993

Plate 13

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Photographs 27: View just north of “residential” type structures in centre of site.



Photographs 28: View of single storey residential type structure in centre of site. View from northern portion of site looking south.



Project:
Land at Gipsy Lane, Tilehurst, Reading, RG30 6EG

Client:
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Date:
June 2017

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Plate 14

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Photographs 29: View of cooking equipment/metal table just north of “residential” type structure.



Photographs 30: Battery stores in “kitchen” area.



Project: Land at Gipsy Lane, Tilehurst, Reading, RG30 6EG		Plate 15 
Client: Alpha One Properties	Date: June 2017	
Appendix B: Site Photographs	Ref: GWPR1993	

Photographs 31: View from “kitchen” area, looking east.



Photographs 32: View from site entrance looking south toward caravan.



Project:

Land at Gipsy Lane, Tilehurst, Reading, RG30 6EG

Client:

Alpha One Properties

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June 2017

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Plate 16

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Photographs 33: View of trailer and stored materials/waste in southern portion of site, near site entrance.



Photographs 34: View of rusting break discs present onsite.



Project:

Land at Gipsy Lane, Tilehurst, Reading, RG30 6EG

Client:

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Date:

June 2017

Appendix B: Site Photographs

Ref:

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Plate 17

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Photographs 35: View of stored gas canisters in southern portion of the site.



Photographs 36: View of stored materials/waste onsite



Project:
Land at Gipsy Lane, Tilehurst, Reading, RG30 6EG

Client:
Alpha One Properties

Date:
June 2017

Appendix B: Site Photographs

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Plate 18

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Photographs 37: View of stored materials/waste onsite



Photographs 38: View of stored materials/waste onsite



Project:

Land at Gipsy Lane, Tilehurst, Reading, RG30 6EG

Client:

Alpha One Properties

Date:

June 2017

Appendix B: Site Photographs

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Plate 19

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Photographs 39: View of stored materials, including wood and plastic bottles in south-west corner of the site.



Photographs 40: View along southern boundary of the site, view looking east.



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Land at Gipsy Lane, Tilehurst, Reading, RG30 6EG

Client:
Alpha One Properties

Date:
June 2017

Appendix B: Site Photographs

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Plate 20

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Photographs 41: View of batteries stored in southern portion of the site.



Photographs 42: View of store materials/waste onsite.



Project:

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Client:

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Date:

June 2017

Appendix B: Site Photographs

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GWPR1993

Plate 21

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Photographs 43: View of store materials/waste onsite.



Photographs 44: View looking beyond northern boundary of site, view looking north/north-west.



Project:

Land at Gipsy Lane, Tilehurst, Reading, RG30 6EG

Client:

Alpha One Properties

Date:

June 2017

Appendix B: Site Photographs

Ref:

GWPR1993

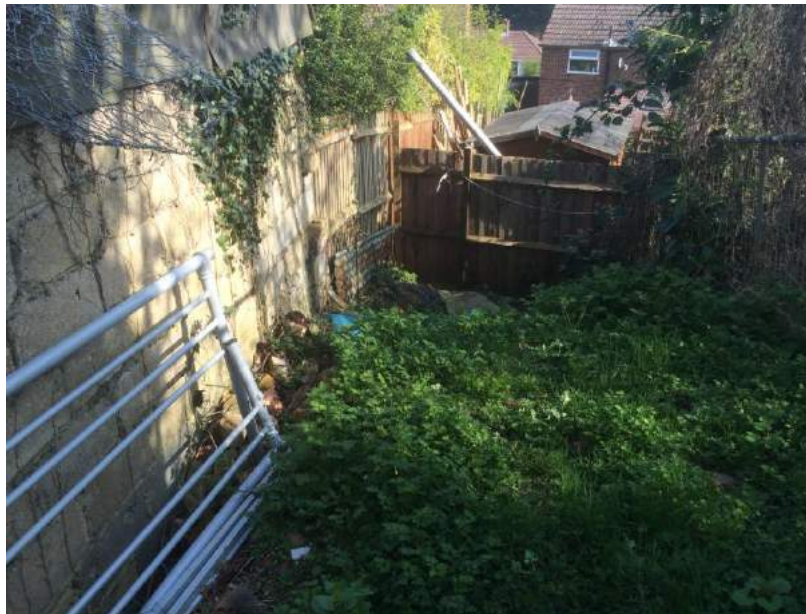
Plate 22

ground&water

Photographs 45: View of store materials/waste onsite.



Photographs 46: View of eastern portion of the site, looking north.



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Land at Gipsy Lane, Tilehurst, Reading, RG30 6EG

Client:

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Appendix B: Site Photographs

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Plate 23

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Photographs 47: View looking north-west over the top of “residential” type structures in centre of site.



Photographs 48: View of eastern portion of the site, looking north-west.



Project: Land at Gipsy Lane, Tilehurst, Reading, RG30 6EG		Plate 24 ground&water
Client: Alpha One Properties	Date: June 2017	
Appendix B: Site Photographs	Ref: GWPR1993	

Photographs 49: View of eastern part of southern boundary of site.



Photographs 50: View of central portion of site and southern boundary, including site entrance.



Project:
Land at Gipsy Lane, Tilehurst, Reading, RG30 6EG

Client:
Alpha One Properties

Date:
June 2017

Appendix B: Site Photographs

Ref:
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Plate 25

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APPENDIX C

Historical Maps

Site Details:

Land at Gypsy Lane (Rear of 246
- 250 RODWAY ROAD),
READING, RG30 6EG

Client Ref: GWPR1993
Report Ref: HMD-445-3838621
Grid Ref: 467703, 174179

Map Name: County Series

Map date: 1877-1881

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1879
Revised 1879
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1881
Revised 1881
Edition N/A
Copyright N/A
Levelled N/A

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

Surveyed 1881
Revised 1881
Edition N/A
Copyright N/A
Levelled N/A

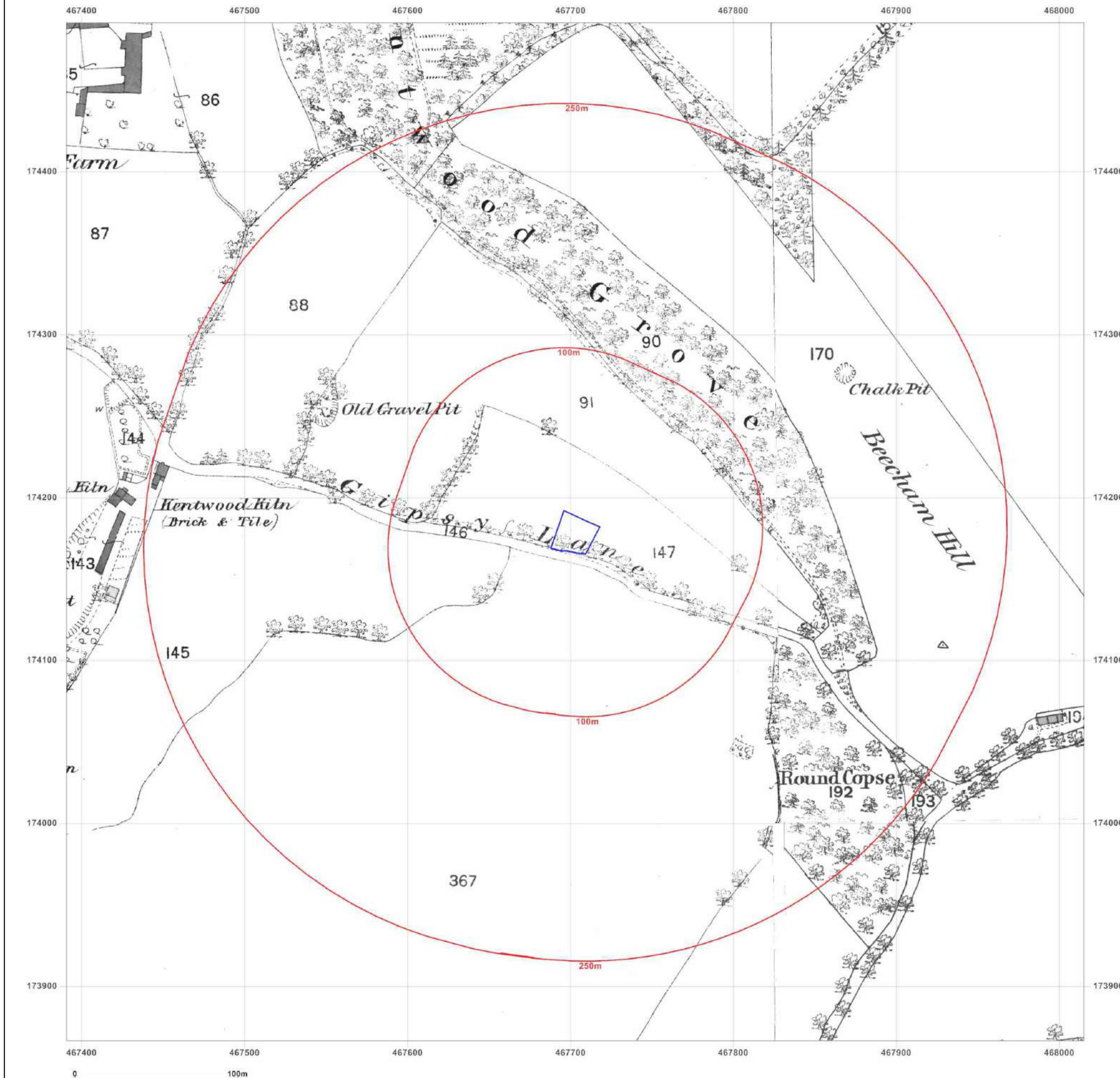


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Production date: 28 April 2017

To view map legend click here [Legend](#)



Site Details:

Land at Gypsy Lane (Rear of 246
- 250 RODWAY ROAD),
READING, RG30 6EG

Client Ref: GWPR1993
Report Ref: HMD-445-3838621
Grid Ref: 467703, 174179

Map Name: County Series

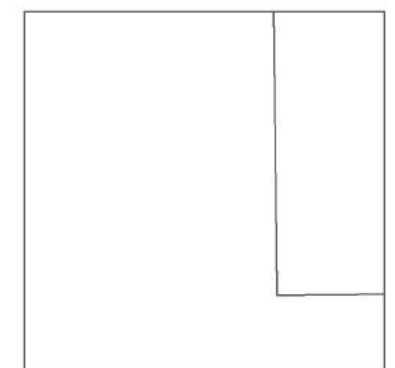
Map date: 1897

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1897
Revised 1897
Edition N/A
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Site Details:

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- 250 RODWAY ROAD),
READING, RG30 6EG

Client Ref: GWPR1993
Report Ref: HMD-445-3838621
Grid Ref: 467703, 174179

Map Name: County Series

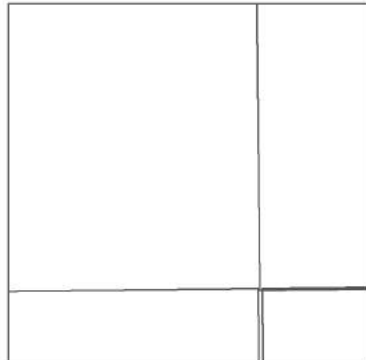
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Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1897
Revised 1897
Edition N/A
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Surveyed 1899
Revised 1899
Edition N/A
Copyright N/A
Levelled N/A

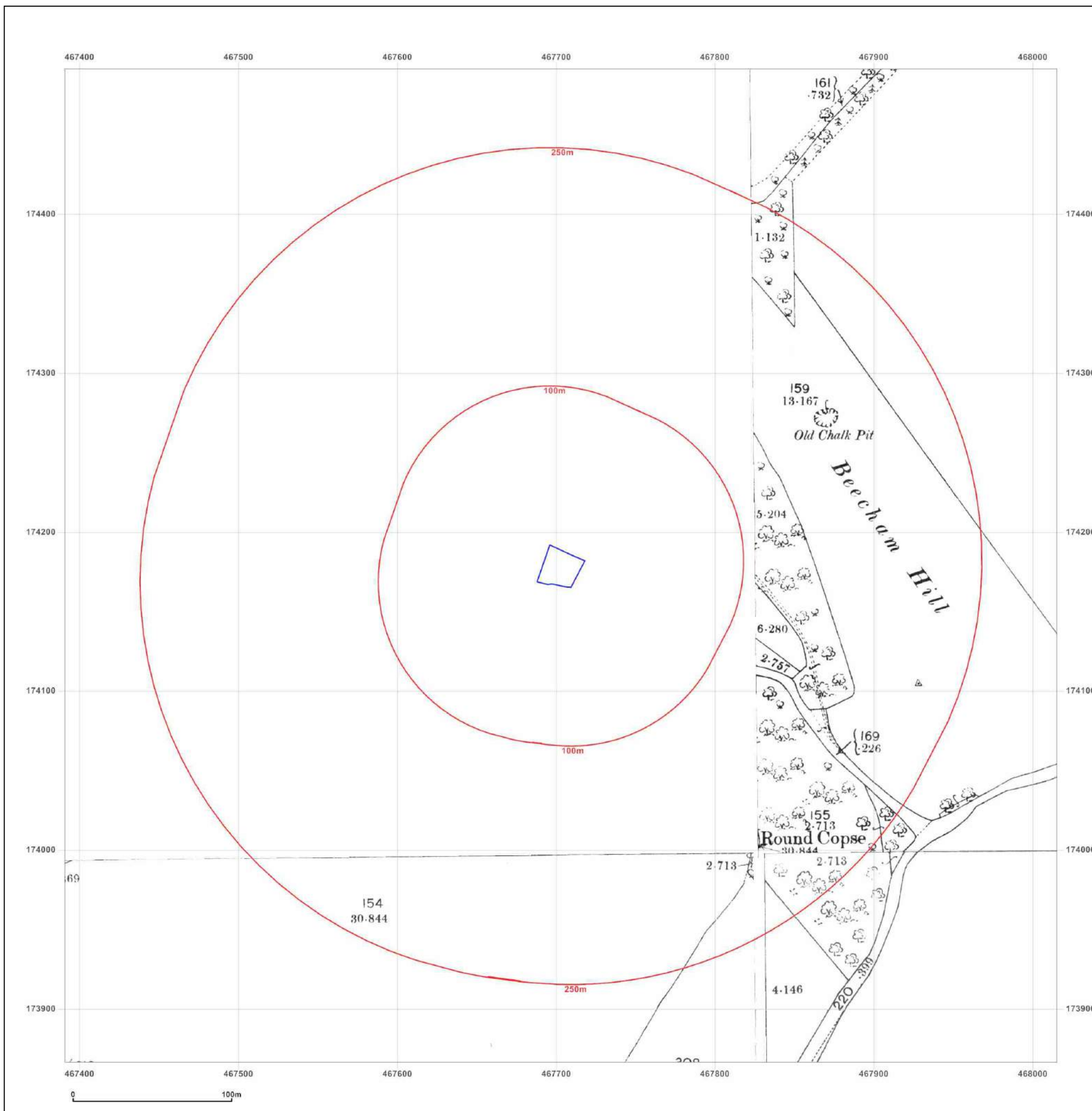


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Site Details:

Land at Gypsy Lane (Rear of 246
- 250 RODWAY ROAD),
READING, RG30 6EG

Client Ref: GWPR1993
Report Ref: HMD-445-3838621
Grid Ref: 467703, 174179

Map Name: County Series

Map date: 1911-1913

Scale: 1:2,500

Printed at: 1:2,500



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Revised 1913
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1912
Revised 1912
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1911
Revised 1911
Edition N/A
Copyright N/A
Levelled N/A

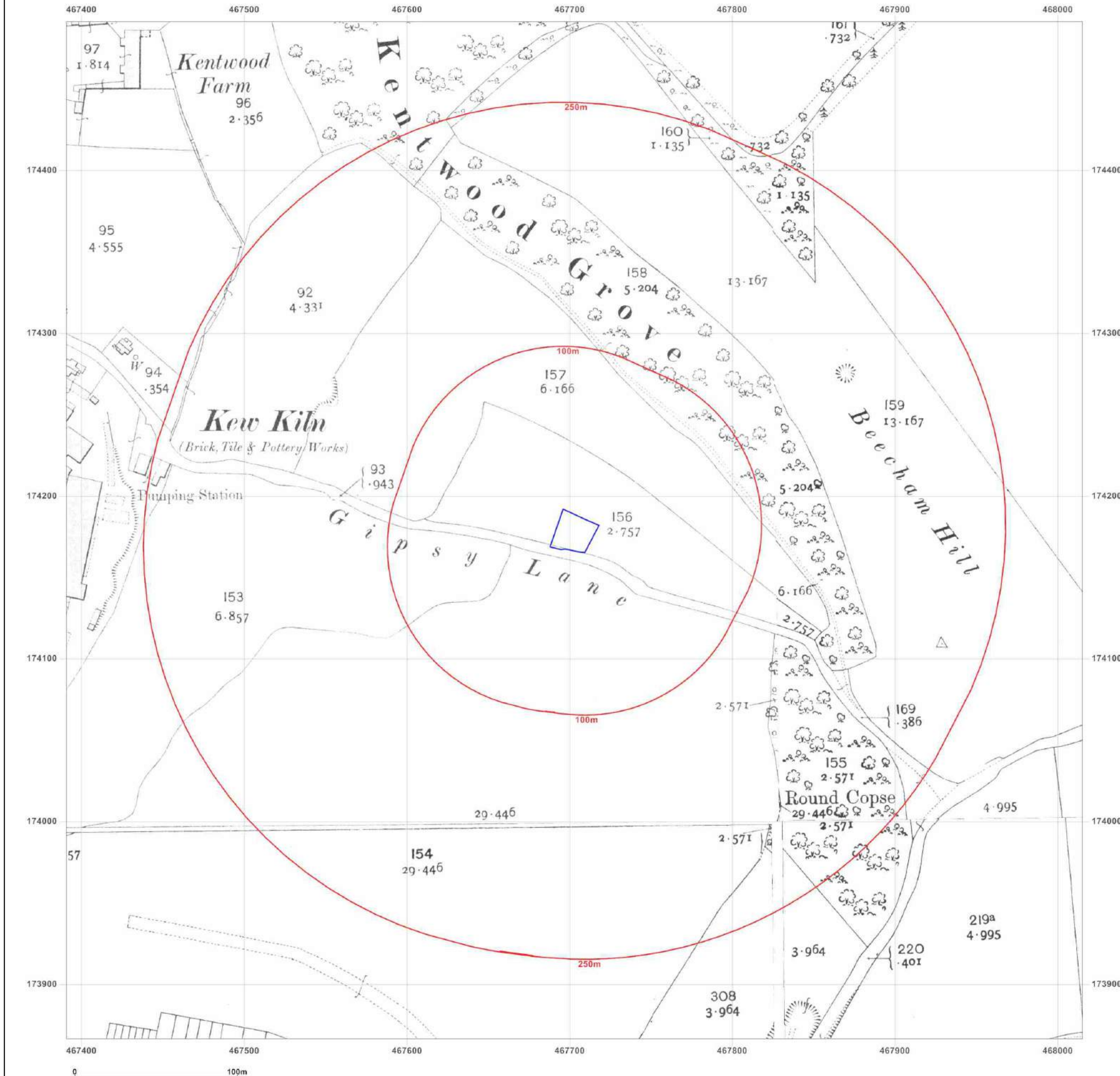


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Site Details:

Land at Gypsy Lane (Rear of 246
- 250 RODWAY ROAD),
READING, RG30 6EG

Client Ref: GWPR1993
Report Ref: HMD-445-3838621
Grid Ref: 467703, 174179

Map Name: County Series

Map date: 1932-1934

Scale: 1:2,500

Printed at: 1:2,500



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Edition N/A
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Surveyed 1934
Revised 1934
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1932
Revised 1932
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1932
Revised 1932
Edition N/A
Copyright N/A
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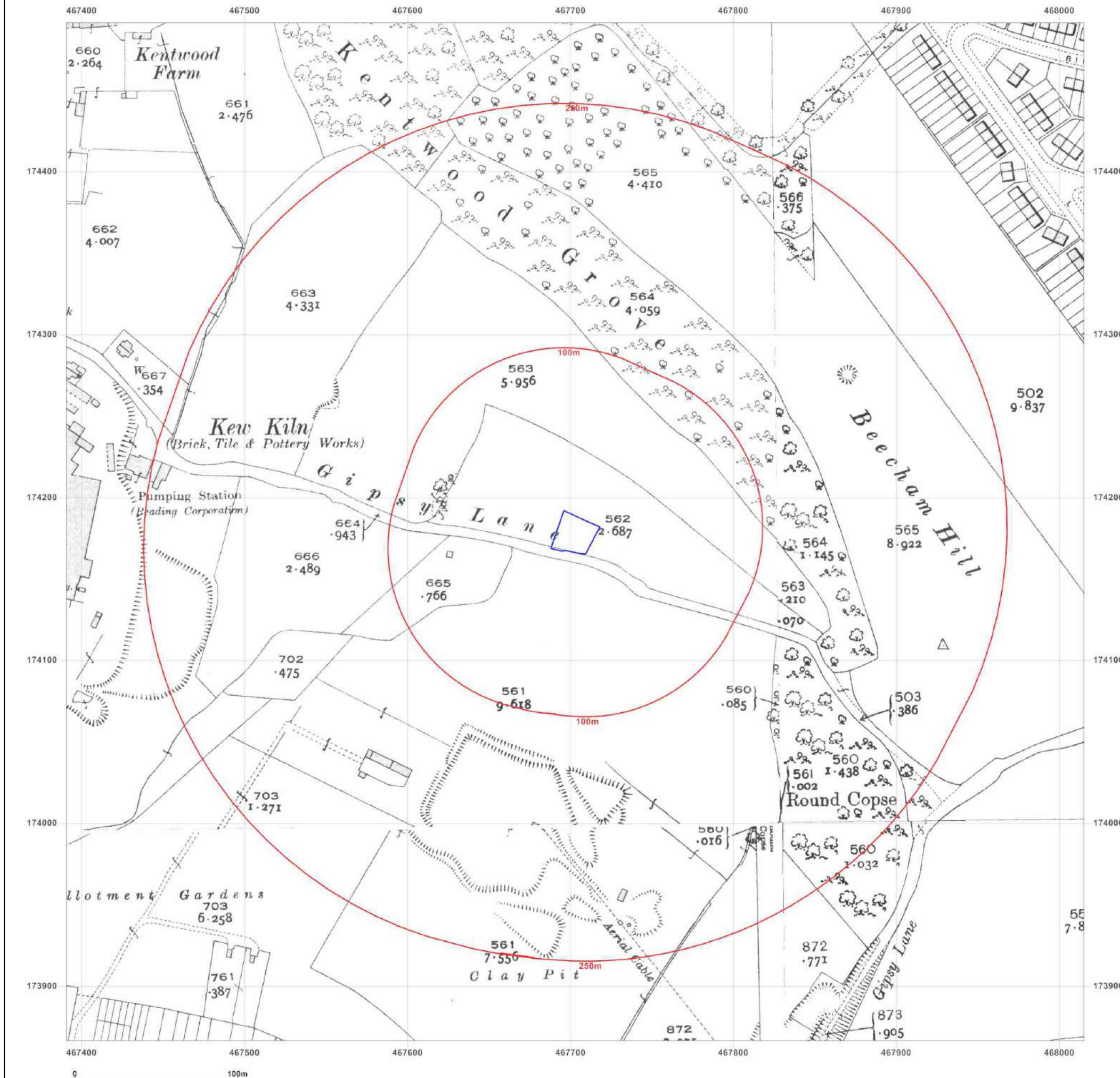


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Site Details:

Land at Gypsy Lane (Rear of 246
- 250 RODWAY ROAD),
READING, RG30 6EG

Client Ref: GWPR1993
Report Ref: HMD-445-3838621
Grid Ref: 467703, 174179

Map Name: County Series

Map date: 1936

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1936
Revised 1936
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1936
Revised 1936
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1936
Revised 1936
Edition N/A
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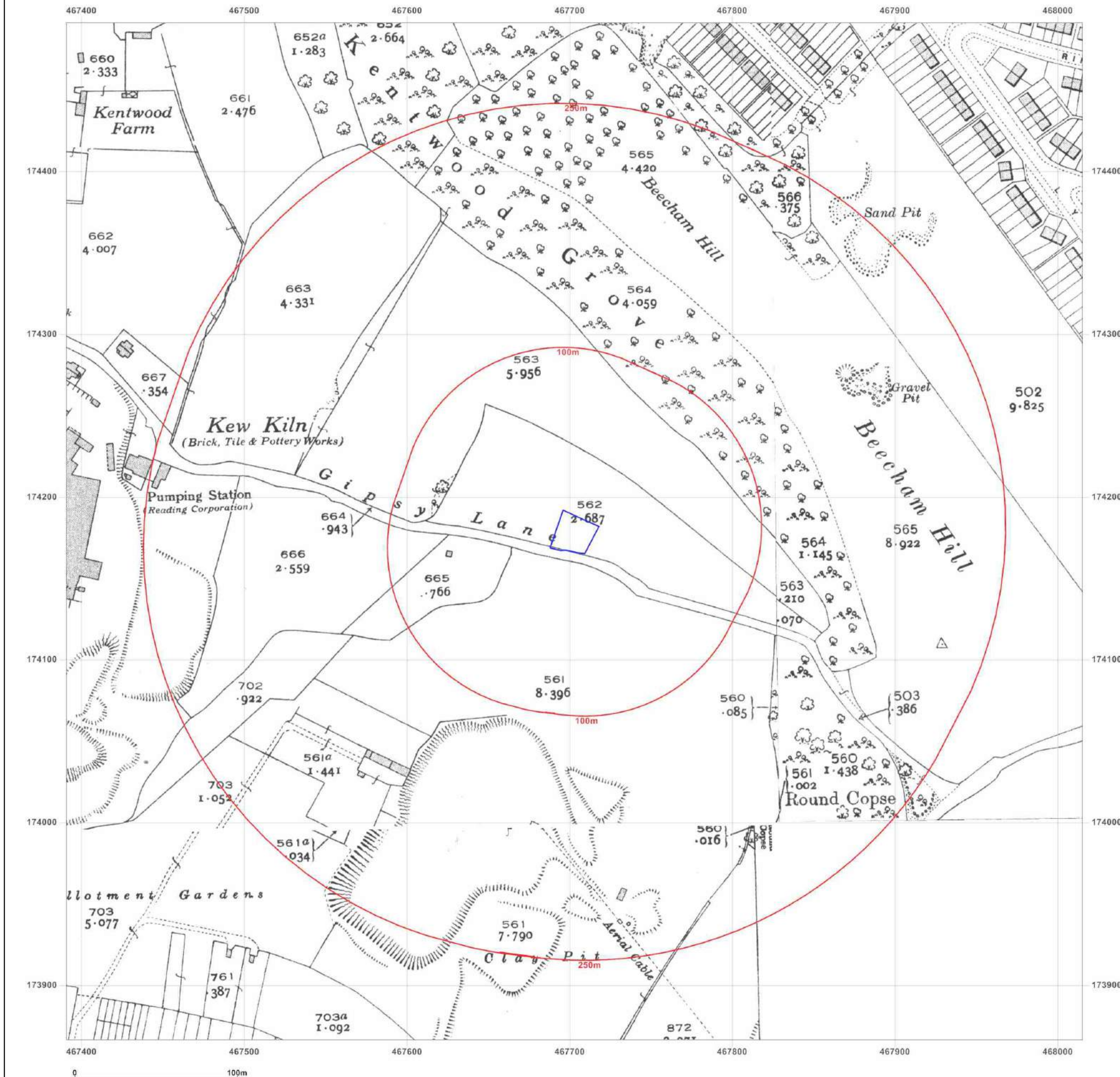


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Site Details:

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READING, RG30 6EG

Client Ref: GWPR1993
Report Ref: HMD-445-3838621
Grid Ref: 467703, 174179

Map Name: National Grid

Map date: 1961

Scale: 1:1,250

Printed at: 1:2,000



Surveyed 1960
Revised 1960
Edition N/A
Copyright 1961
Levelled 1951

Surveyed 1960
Revised 1960
Edition N/A
Copyright 1961
Levelled 1951

Surveyed 1960
Revised 1960
Edition N/A
Copyright 1961
Levelled 1951

Surveyed 1960
Revised 1960
Edition N/A
Copyright 1961
Levelled 1951

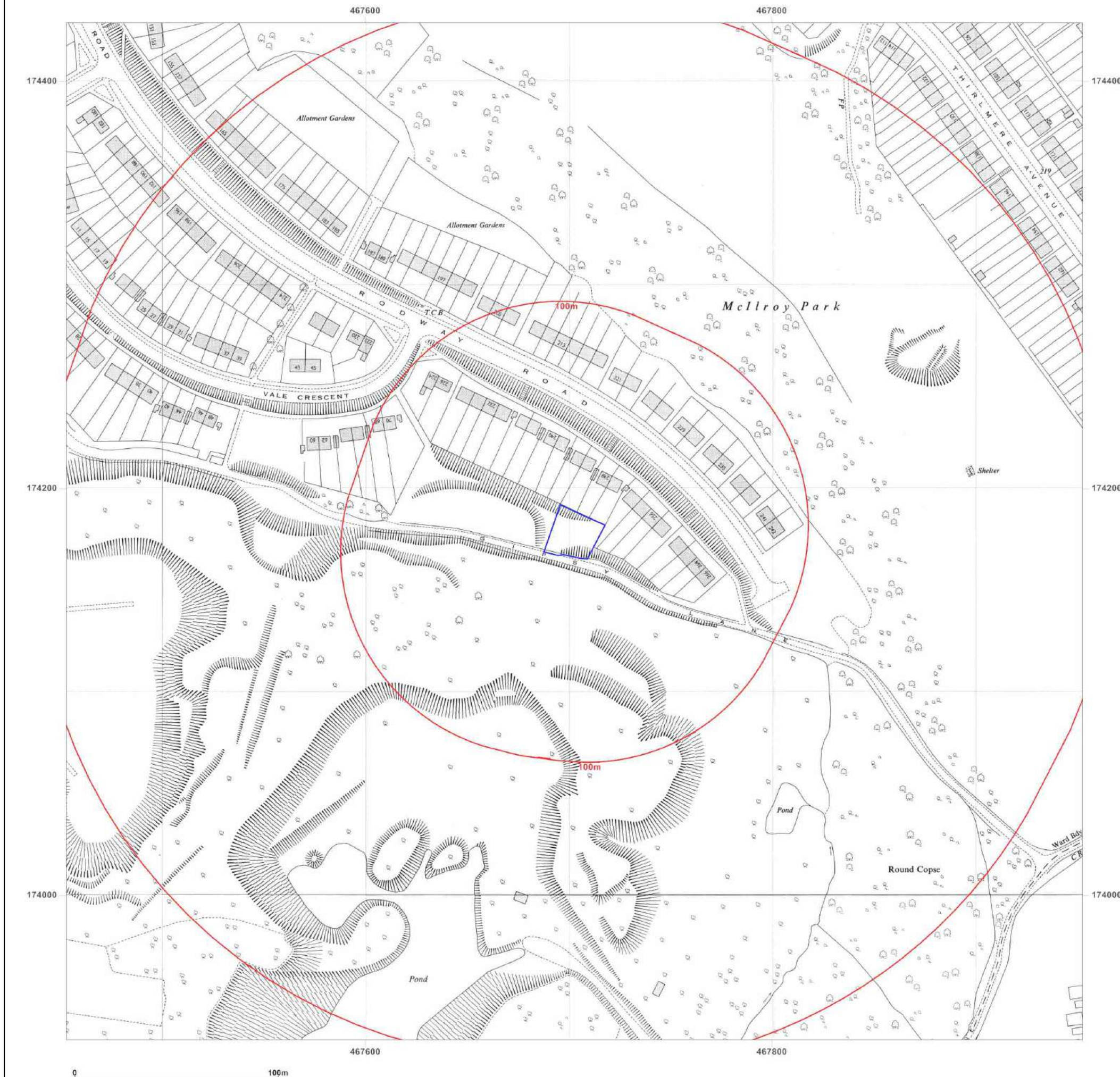


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Client Ref: GWPR1993
Report Ref: HMD-445-3838621
Grid Ref: 467703, 174179

Map Name: National Grid

Map date: 1967-1971

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1967
Revised 1967
Edition N/A
Copyright 1969
Levelled 1951

Surveyed 1961
Revised 1970
Edition N/A
Copyright 1971
Levelled 1951

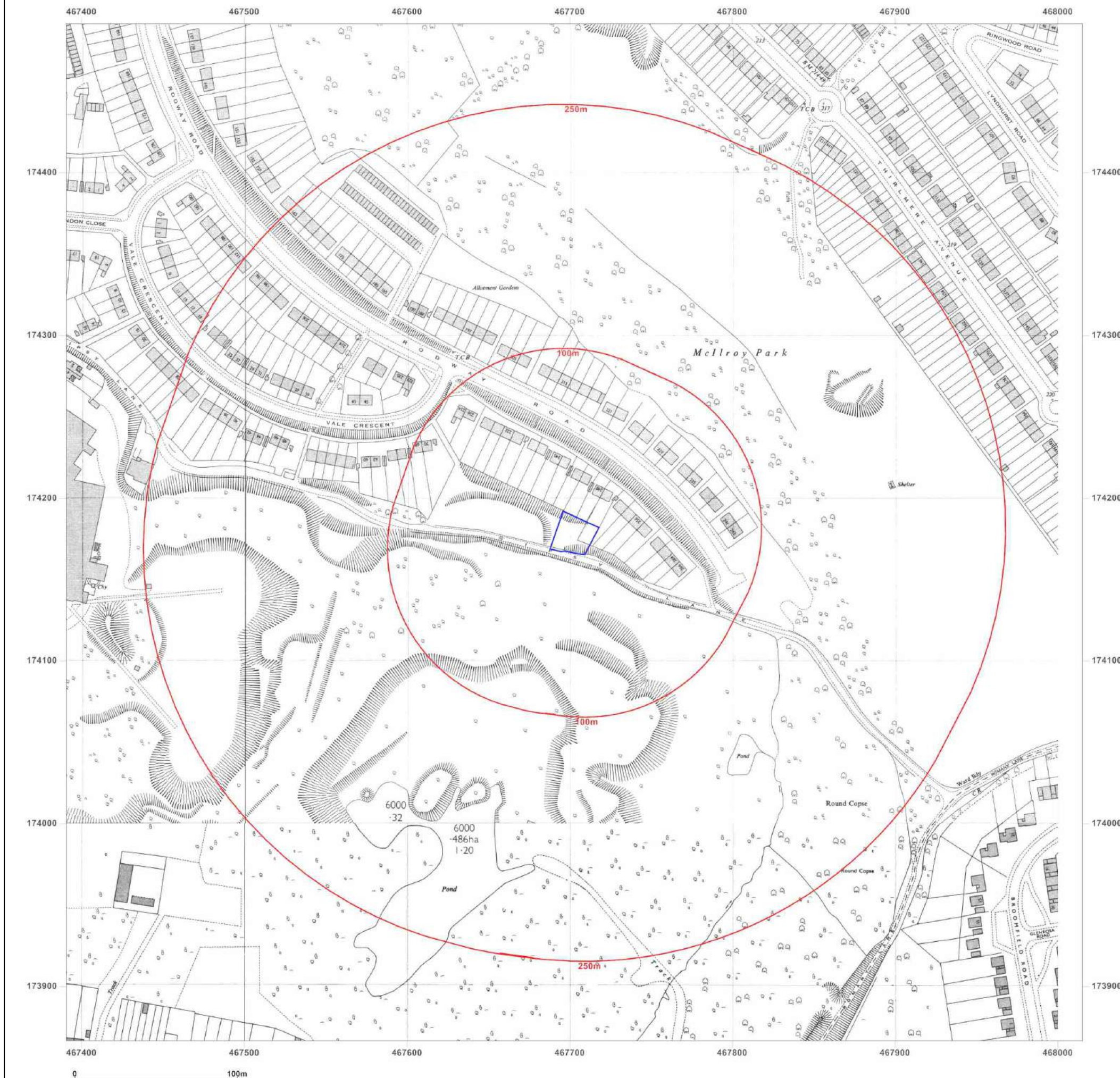


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Client Ref: GWPR1993
Report Ref: HMD-445-3838621
Grid Ref: 467703, 174179

Map Name: National Grid

Map date: 1978-1982

Scale: 1:1,250

Printed at: 1:2,000



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Revised N/A
Edition N/A
Copyright 1982
Levelled 1972

Surveyed 1978
Revised 1978
Edition N/A
Copyright 1978
Levelled N/A

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Revised N/A
Edition N/A
Copyright 1982
Levelled 1972

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Revised N/A
Edition N/A
Copyright 1978
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Client Ref: GWPR1993
Report Ref: HMD-445-3838621
Grid Ref: 467703, 174179

Map Name: National Grid

Map date: 1983-1987

Scale: 1:1,250

Printed at: 1:2,000



Surveyed 1972
Revised 1986
Edition N/A
Copyright 1986
Levelled 1972

Surveyed 1960
Revised 1982
Edition N/A
Copyright 1983
Levelled 1972

Surveyed 1960
Revised 1985
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Surveyed 1960
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Site Details:

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Client Ref: GWPR1993
Report Ref: HMD-445-3838621
Grid Ref: 467703, 174179

Map Name: National Grid

Map date: 1988-1993

Scale: 1:1,250

Printed at: 1:2,000



Surveyed 1960
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Edition N/A
Copyright 1988
Levelled 1972

Surveyed N/A
Revised N/A
Edition N/A
Copyright 1993
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READING, RG30 6EG

Client Ref: GWPR1993
Report Ref: HMD-445-3838621
Grid Ref: 467703, 174179

Map Name: National Grid

Map date: 1993

Scale: 1:1,250

Printed at: 1:2,000



Surveyed 1993
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Edition N/A
Copyright 1993
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Surveyed 1993
Revised 1993
Edition N/A
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Site Details:

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READING, RG30 6EG

Client Ref: GWPR1993
Report Ref: HMD-445-3838621
Grid Ref: 467703, 174179

Map Name: County Series

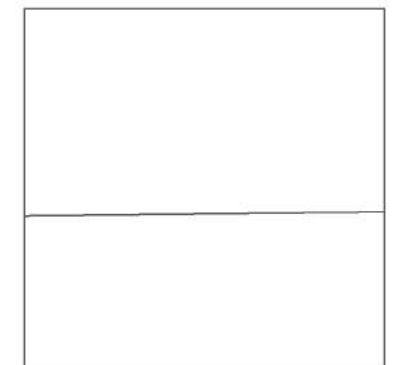
Map date: 1878

Scale: 1:10,560

Printed at: 1:10,560



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

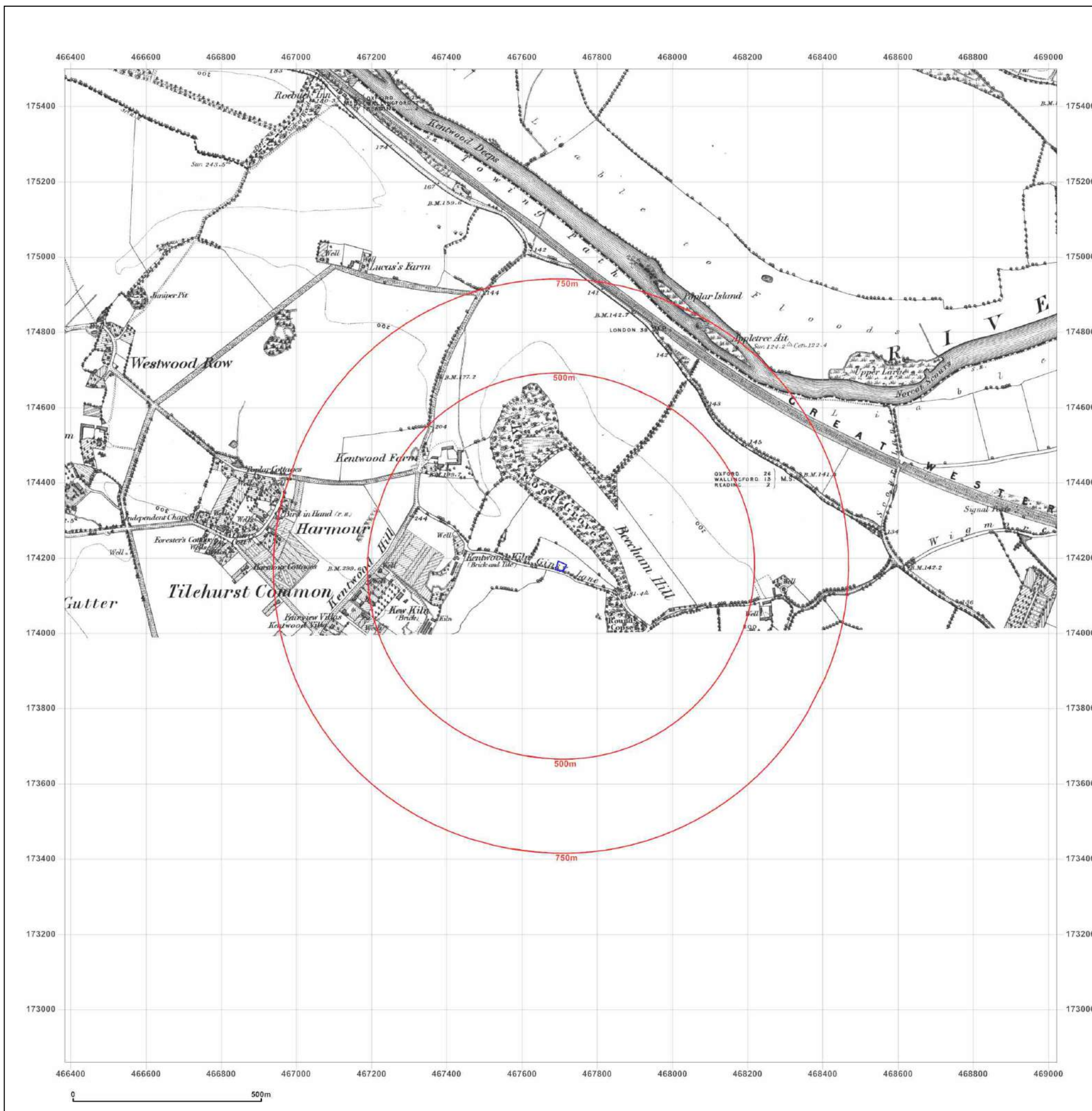


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Site Details:

Land at Gypsy Lane (Rear of 246
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READING, RG30 6EG

Client Ref: GWPR1993
Report Ref: HMD-445-3838621
Grid Ref: 467703, 174179

Map Name: County Series

Map date: 1900

Scale: 1:10,560

Printed at: 1:10,560



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

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

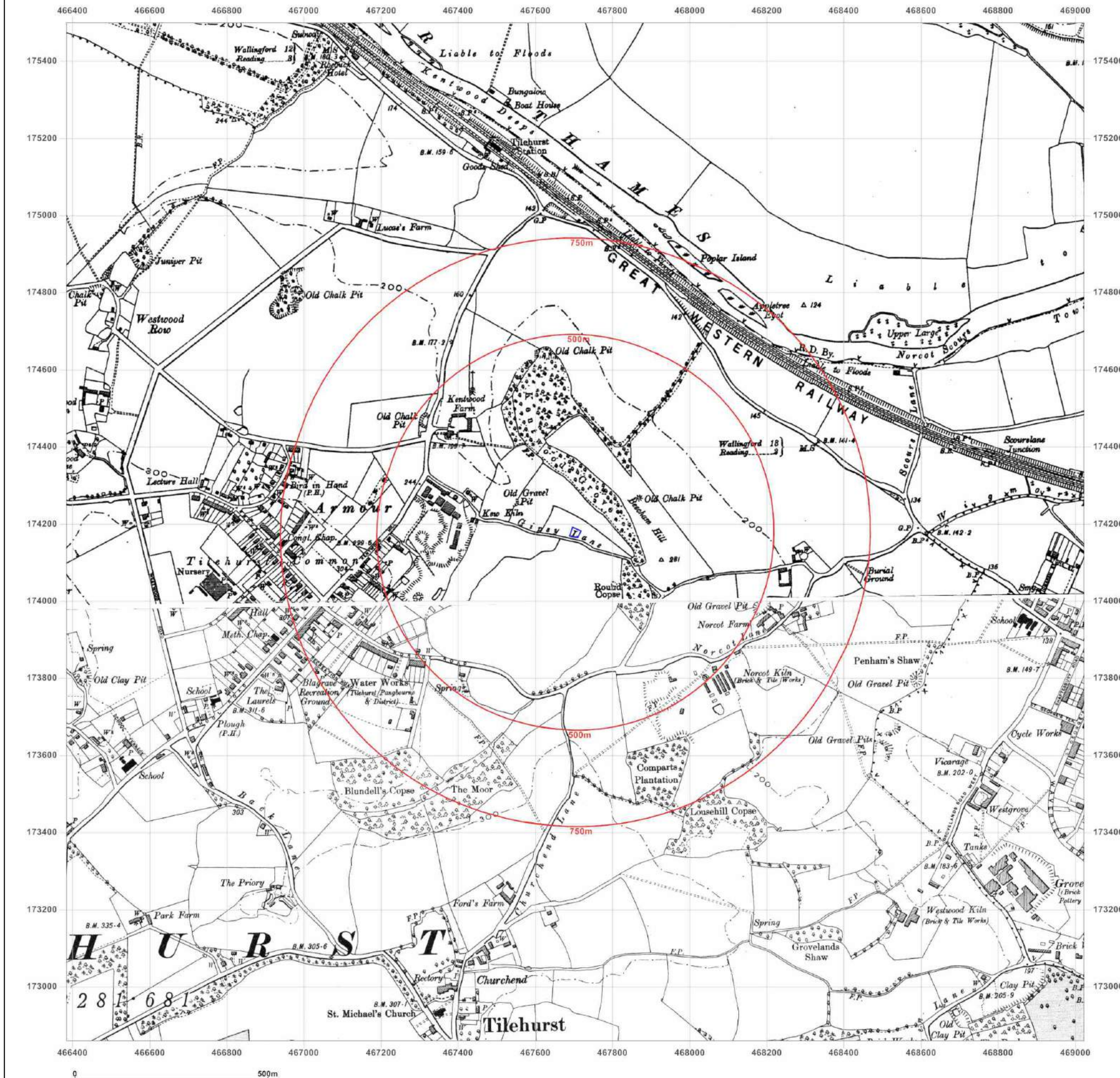


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Client Ref: GWPR1993
Report Ref: HMD-445-3838621
Grid Ref: 467703, 174179

Map Name: County Series

Map date: 1900

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1877
Revised 1897
Edition 1900
Copyright N/A
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Surveyed 1877
Revised 1898
Edition 1900
Copyright N/A
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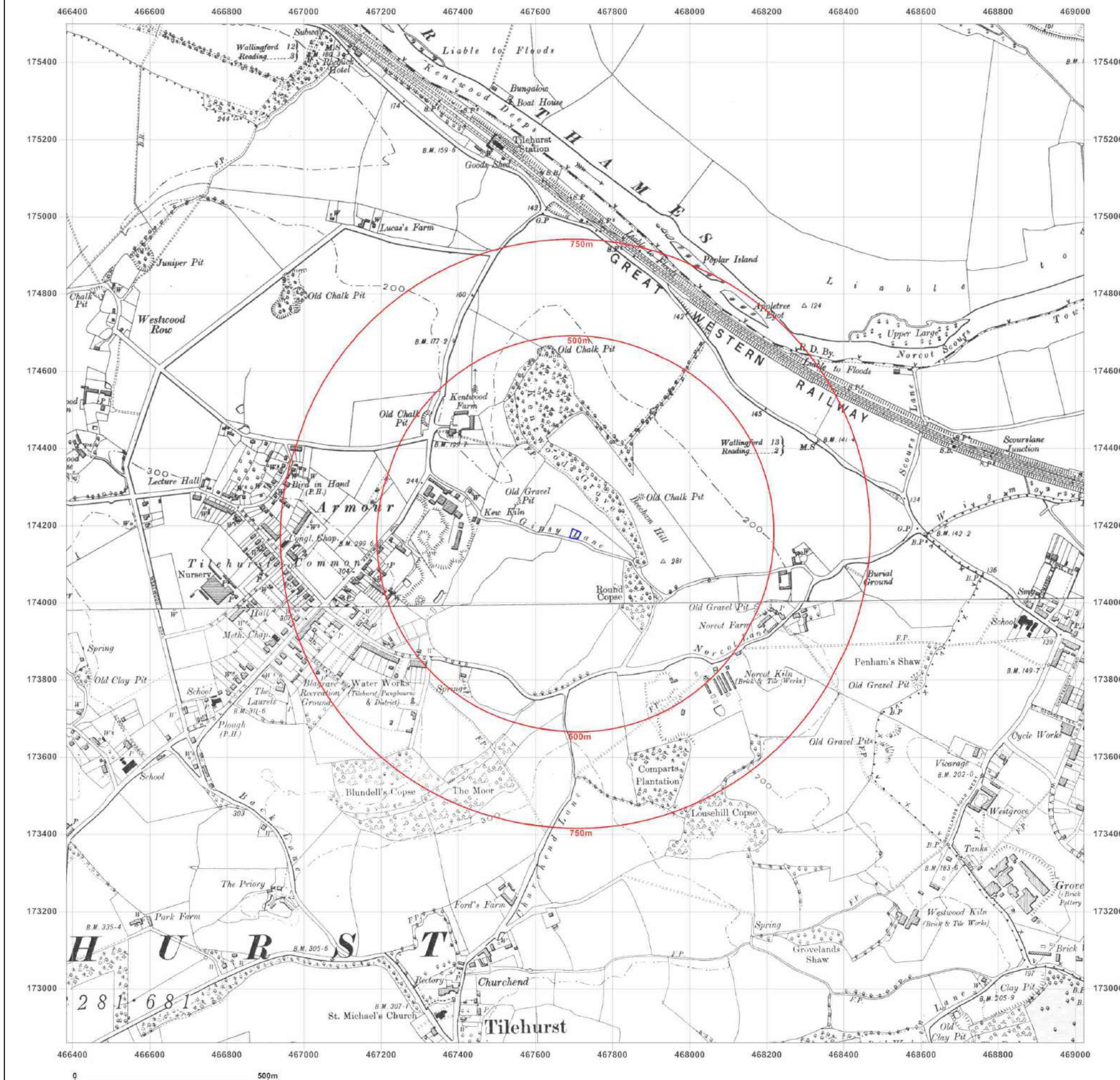


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Client Ref: GWPR1993
Report Ref: HMD-445-3838621
Grid Ref: 467703, 174179

Map Name: County Series

Map date: 1910

Scale: 1:10,560

Printed at: 1:10,560



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Revised 1910
Edition N/A
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Revised 1910
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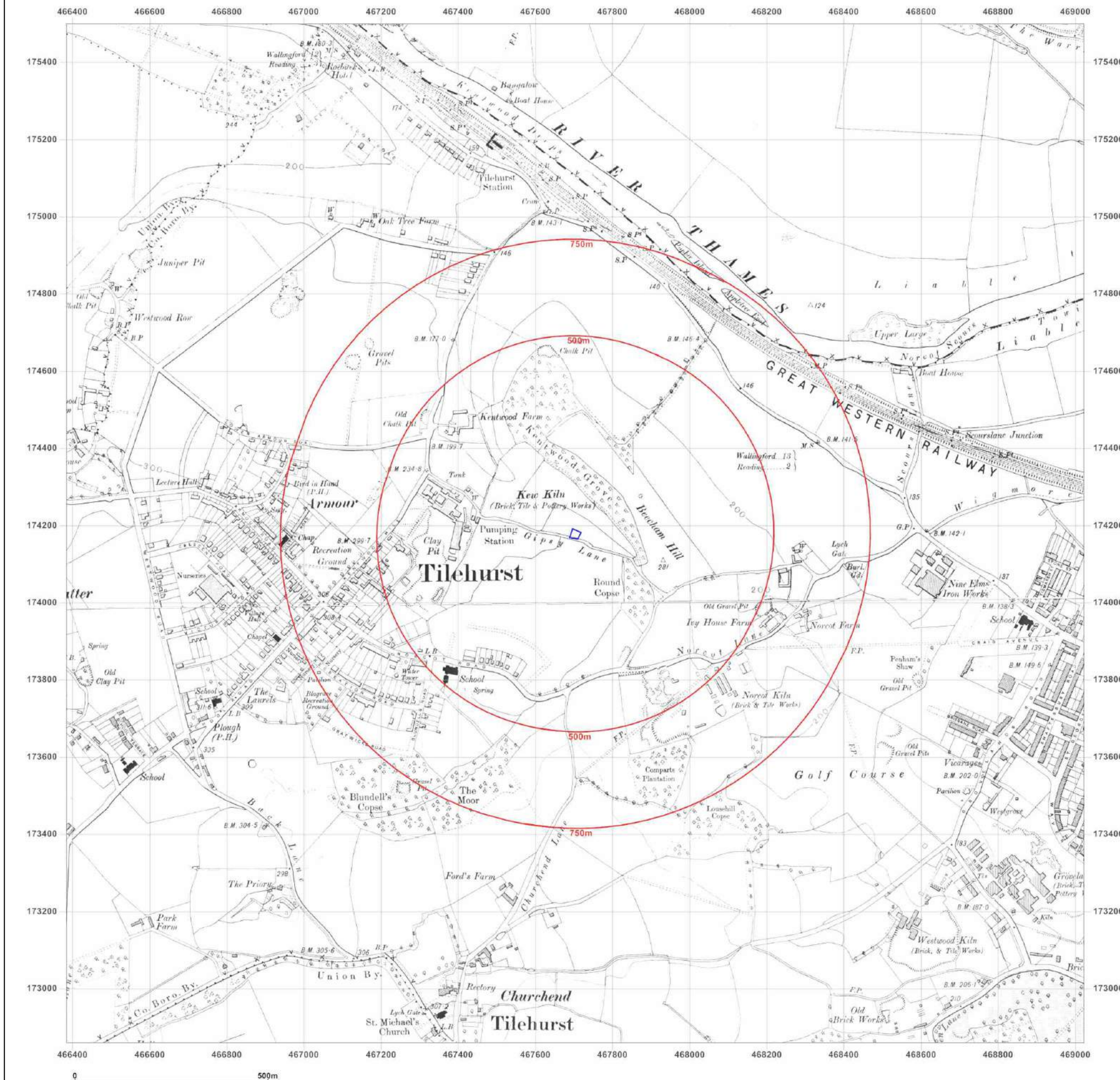


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Client Ref: GWPR1993
Report Ref: HMD-445-3838621
Grid Ref: 467703, 174179

Map Name: County Series

Map date: 1932

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1877
Revised 1932
Edition N/A
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Surveyed 1877
Revised 1932
Edition N/A
Copyright N/A
Levelled N/A

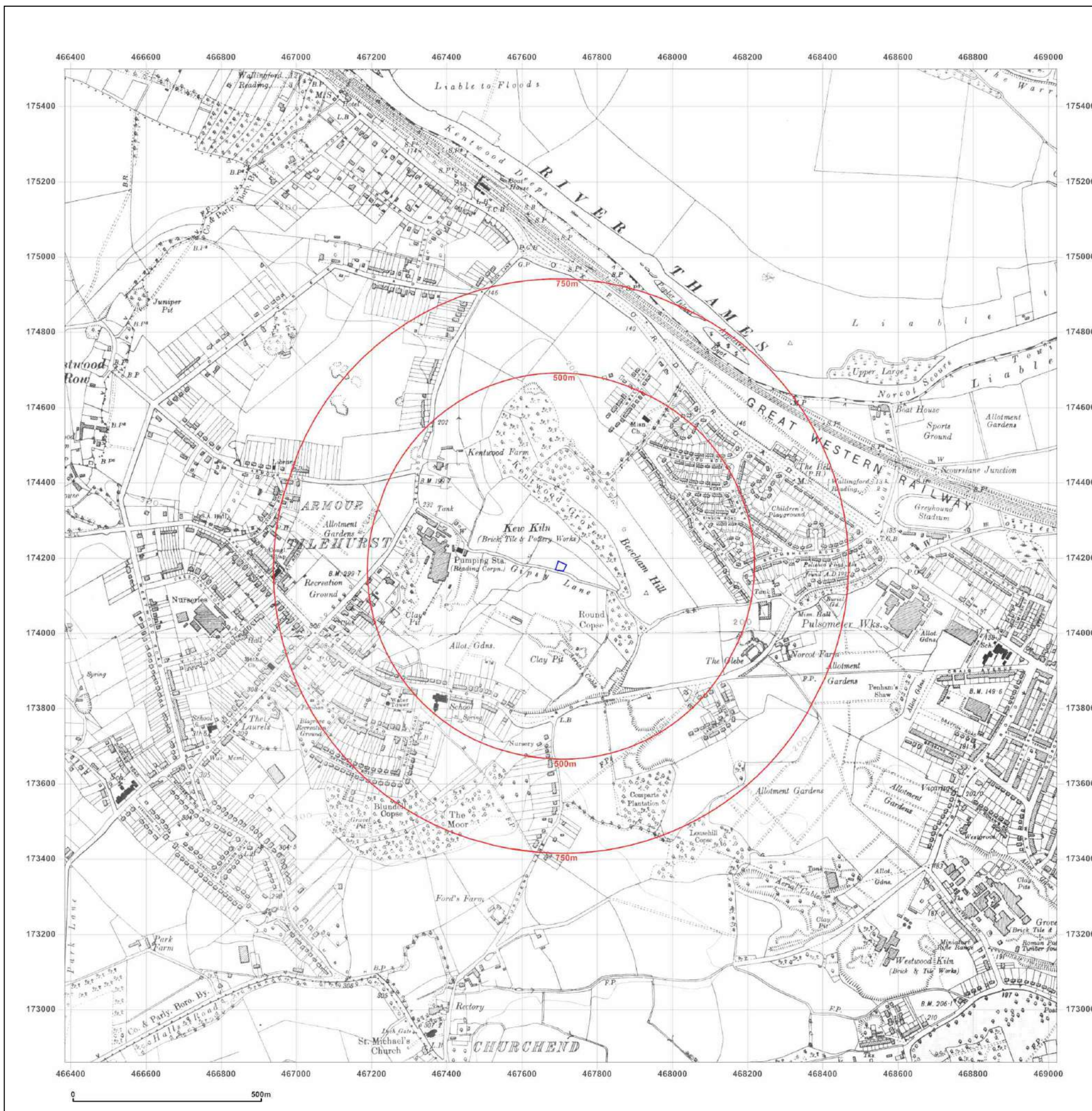


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Land at Gypsy Lane (Rear of 246
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READING, RG30 6EG

Client Ref: GWPR1993
Report Ref: HMD-445-3838621
Grid Ref: 467703, 174179

Map Name: County Series

Map date: 1938

Scale: 1:10,560

Printed at: 1:10,560



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

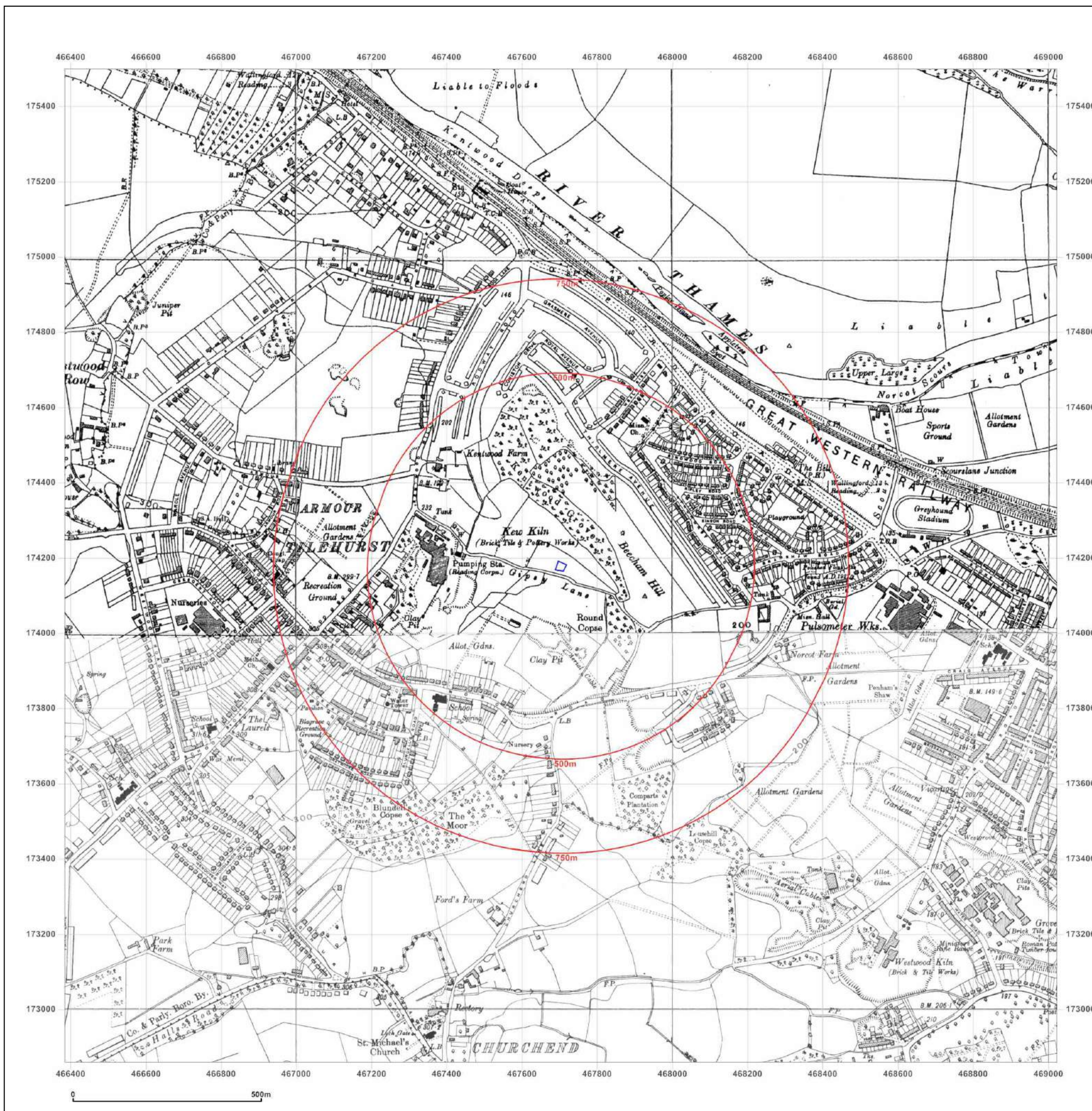


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Site Details:

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Client Ref: GWPR1993
Report Ref: HMD-445-3838621
Grid Ref: 467703, 174179

Map Name: County Series

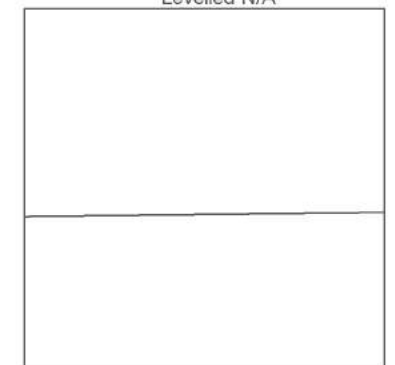
Map date: 1938

Scale: 1:10,560

Printed at: 1:10,560



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Edition 1938
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Client Ref: GWPR1993
Report Ref: HMD-445-3838621
Grid Ref: 467703, 174179

Map Name: County Series

Map date: 1938

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1877
Revised 1938
Edition N/A
Copyright N/A
Levelled N/A

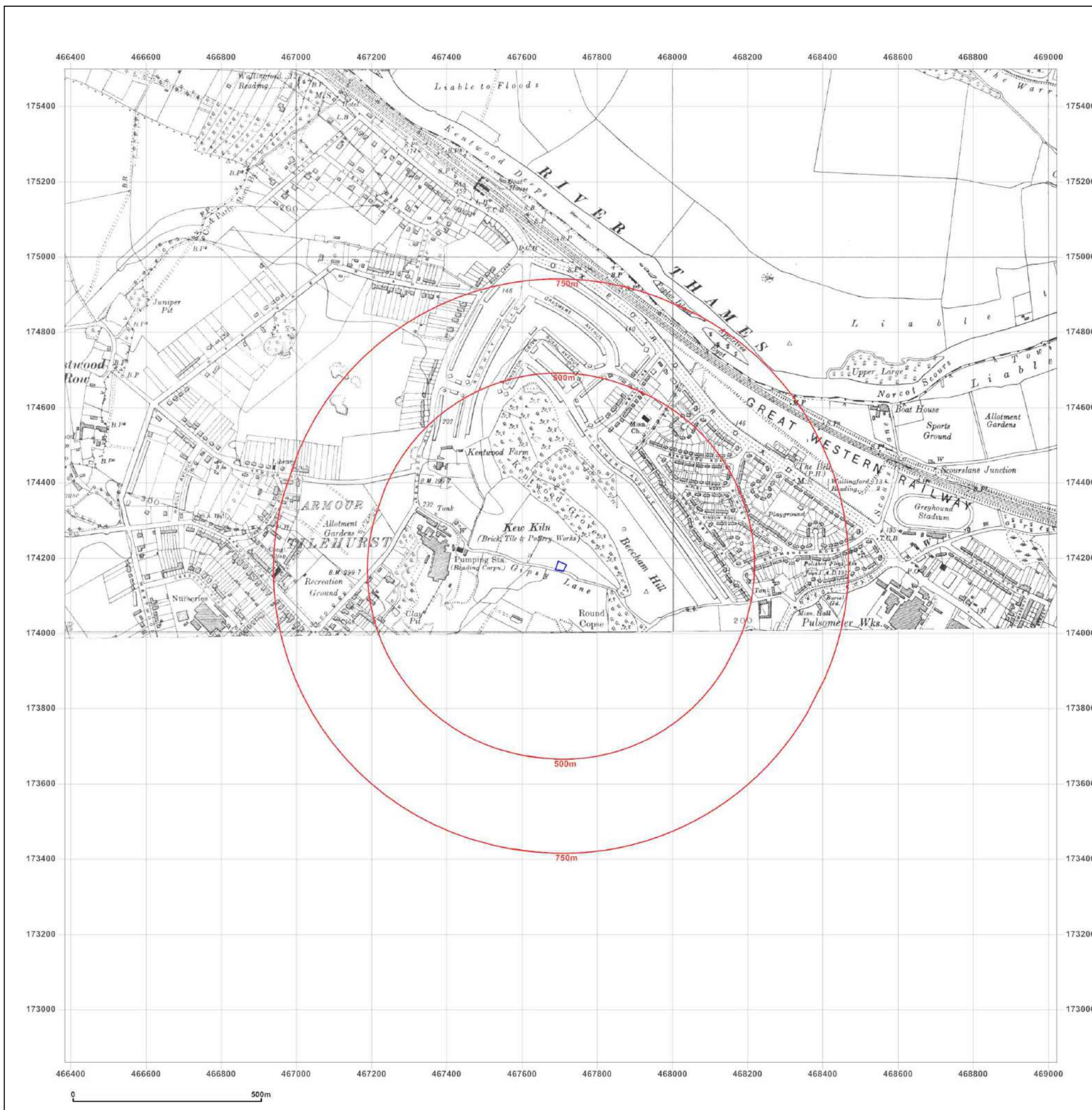


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Site Details:

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READING, RG30 6EG

Client Ref: GWPR1993
Report Ref: HMD-445-3838621
Grid Ref: 467703, 174179

Map Name: Provisional

Map date: 1960-1961

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1956
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Edition N/A
Copyright 1960
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Surveyed N/A
Revised 1960
Edition 1961
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Site Details:

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Client Ref: GWPR1993
Report Ref: HMD-445-3838621
Grid Ref: 467703, 174179

Map Name: Provisional

Map date: 1968

Scale: 1:10,560

Printed at: 1:10,560



Surveyed N/A
Revised 1968
Edition N/A
Copyright 1961
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Site Details:

Land at Gypsy Lane (Rear of 246
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READING, RG30 6EG

Client Ref: GWPR1993
Report Ref: HMD-445-3838621
Grid Ref: 467703, 174179

Map Name: National Grid

Map date: 1976

Scale: 1:10,000

Printed at: 1:10,000



Surveyed 1973
Revised 1975
Edition N/A
Copyright 1976
Levelled 1969

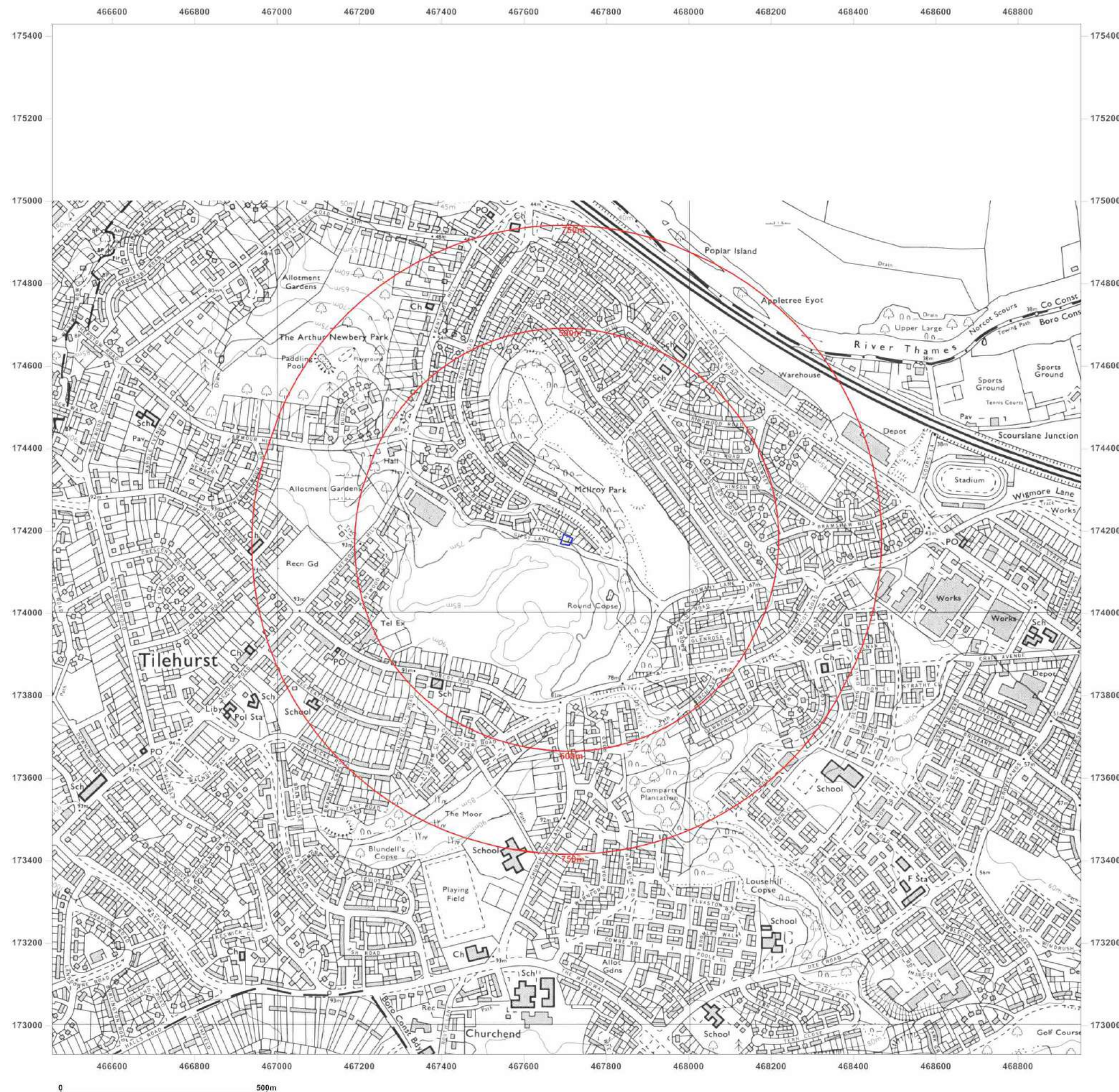


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Site Details:

Land at Gypsy Lane (Rear of 246
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READING, RG30 6EG

Client Ref: GWPR1993
Report Ref: HMD-445-3838621
Grid Ref: 467703, 174179

Map Name: National Grid

Map date: 1982-1983

Scale: 1:10,000

Printed at: 1:10,000



Surveyed 1981
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Edition N/A
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Surveyed 1981
Revised 1982
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Client Ref: GWPR1993
Report Ref: HMD-445-3838621
Grid Ref: 467703, 174179

Map Name: National Grid

Map date: 1991

Scale: 1:10,000

Printed at: 1:10,000



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Site Details:

Land at Gypsy Lane (Rear of 246
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READING, RG30 6EG

Client Ref: GWPR1993
Report Ref: HMD-445-3838621
Grid Ref: 467703, 174179

Map Name: 1:10,000 Raster

Map date: 2002

Scale: 1:10,000

Printed at: 1:10,000



2002



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Site Details:

Land at Gypsy Lane (Rear of 246
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READING, RG30 6EG

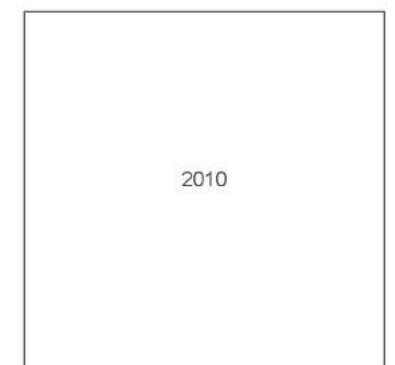
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Report Ref: HMD-445-3838621
Grid Ref: 467703, 174179

Map Name: National Grid

Map date: 2010

Scale: 1:10,000

Printed at: 1:10,000

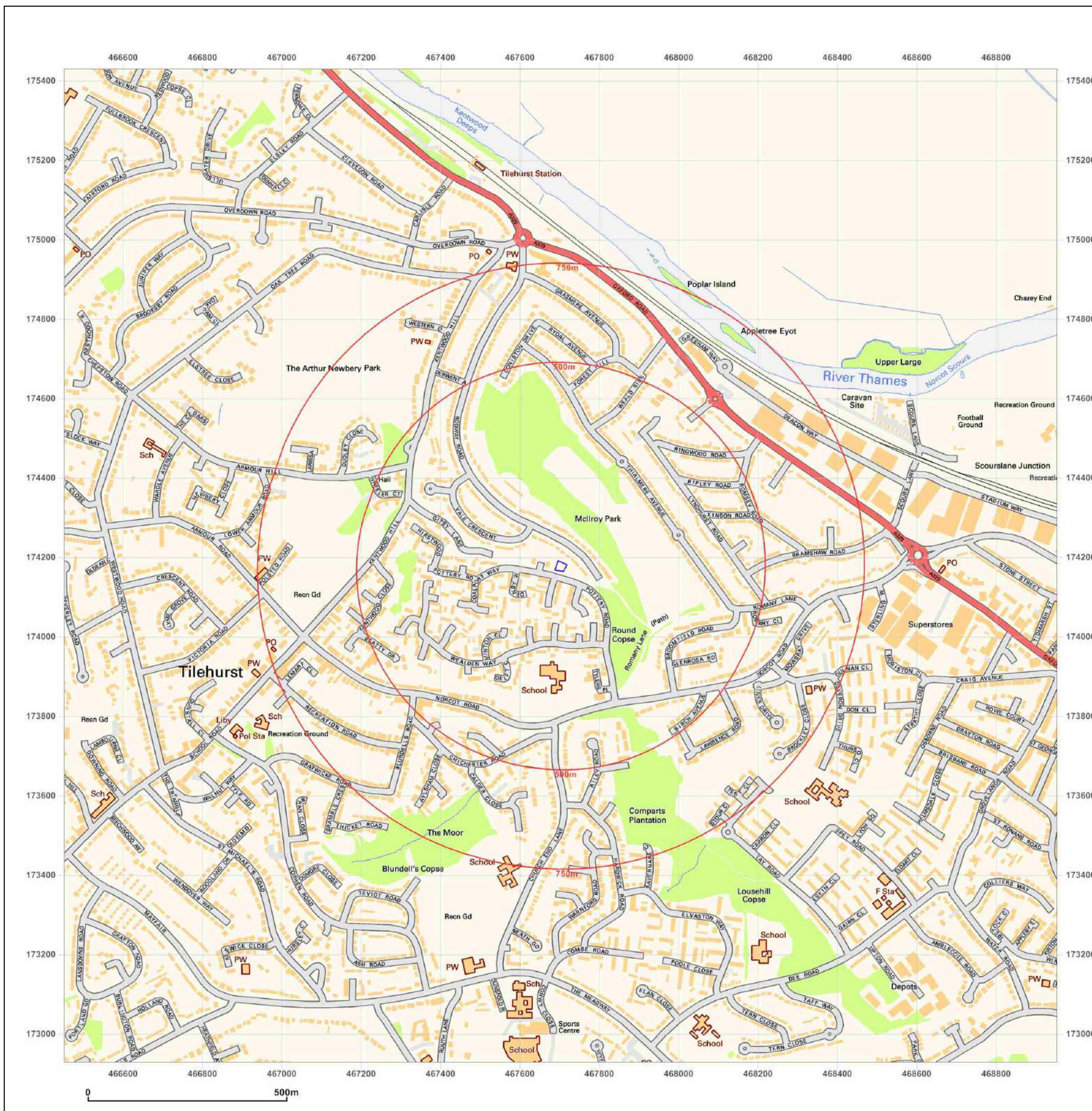


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Site Details:

Land at Gypsy Lane (Rear of 246
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READING, RG30 6EG

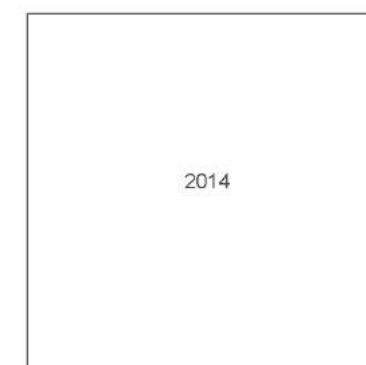
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Grid Ref: 467703, 174179

Map Name: National Grid

Map date: 2014

Scale: 1:10,000

Printed at: 1:10,000

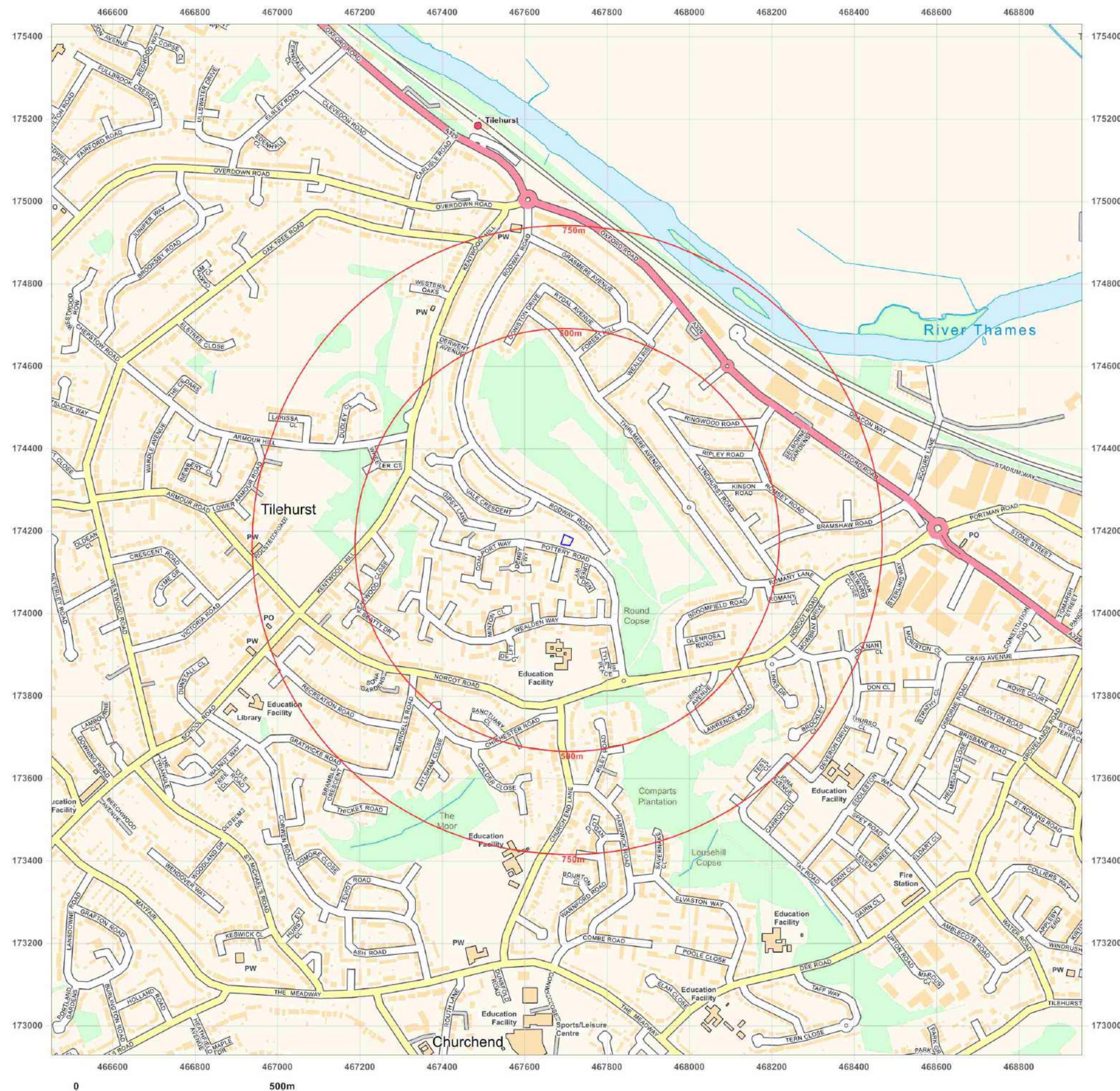


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APPENDIX D
Groundsure Datasheets



Ground and Water Limited
15, Bow Street,
Alton, GU34 1NY

Groundsure Reference: HMD-445-3838619

Your Reference: GWPR1993

Report Date 28 Apr 2017

Report Delivery Method: Email - pdf

Groundsure Enviro Insight

Address: Land at Gypsy Lane Rear of 246 - 250 RODWAY ROAD, READING, RG30 6EG

Dear Sir/ Madam,

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

If you need any further assistance, please do not hesitate to contact our helpline on 08444 159000 quoting the above Groundsure reference number.

Yours faithfully,

Managing Director
Groundsure Limited

Enc.
Groundsure Enviroinsight

Groundsure Enviro Insight

Address: Land at Gypsy Lane Rear of 246 - 250 RODWAY ROAD, READING, RG30 6EG
Date: 28 Apr 2017
Reference: HMD-445-3838619
Client: Ground and Water Limited

NW

N

NE

W

E



SW

S

SE

Aerial Photograph Capture date: 20-Apr-2015
Grid Reference: 467701,174177
Site Size: 0.05ha

Report Reference: HMD-445-3838619
Client Reference: GWPR1993

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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	0	4	34	89
1.2 Additional Information – Historical Tank Database	0	0	0	7
1.3 Additional Information – Historical Energy Features Database	0	0	6	39
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	0	0
1.6 Potentially Infilled Land	0	2	25	73
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	0
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	0	0
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	0	0	0
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	0	0	0	0
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	0	0	1	1	0	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	0	0	Not searched	Not searched
3.2.2 Environment Agency/Natural Resources Wales Licensed Waste Sites	0	0	0	0	2	0

Section 4: Current Land Use	On-site	0-50m	51-250	251-500
4.1 Current Industrial Sites Data	0	0	2	Not searched
4.2 Records of Petrol and Fuel Sites	0	0	0	0
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 Are there any records of Artificial Ground and Made Ground present beneath the study site?	No
5.2 Are there any records of Superficial Ground and Drift Geology present beneath the study site?	Yes
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 Are there any records of Strata Classification in the Superficial Geology within 500m of the study site?				Yes		
6.2 Are there any records of Strata Classification in the Bedrock Geology within 500m of the study site?				Yes		
	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	0	0	14
6.4 Surface Water Abstraction Licences (within 2000m of the study site)	0	0	0	0	0	3
6.5 Potable Water Abstraction Licences (within 2000m of the study site)	0	0	0	0	0	3
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	1	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 Is there any Environment Agency/Natural Resources Wales information on river quality within 1500m of the study site?	No	No	No	No	No	No
6.10 Detailed River Network entries within 500m of the site	0	0	0	0	Not searched	Not searched
6.11 Surface water features within 250m of the study site	No	No	No	Not searched	Not searched	Not searched

Section 7: Flooding						
7.1 Are there any Environment Agency Zone 2 floodplains within 250m of the study site?	No					
7.2 Are there any Environment Agency/Natural Resources Wales Zone 3 floodplains within 250m of the study site	No					
7.3 What is the Risk of flooding from Rivers and the Sea (RoFRaS) rating for the study site?	Very Low					
7.4 Are there any Flood Defences within 250m of the study site?	No					
7.5 Are there any areas benefiting from Flood Defences within 250m of the study site?	No					
7.6 Are there any areas used for Flood Storage within 250m of the study site?	No					
7.7 What is the maximum BGS Groundwater Flooding susceptibility within 50m of the study site?	Limited potential					
7.8 What is the 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	1	0	0	7
8.7 Records of Local Nature Reserves (LNR)	0	0	2	2	1	1
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	2
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	0	0
8.14 Records of Green Belt land	0	0	0	0	0	0

Section 9: Natural Hazards	
9.1 What is the maximum risk of natural ground subsidence?	Moderate
9.1.1 What is the maximum Shrink-Swell hazard rating identified on the study site?	Moderate
9.1.2 What is the maximum Landslides hazard rating identified on the study site?	Low
9.1.3 What is the maximum Soluble Rocks hazard rating identified on the study site?	Moderate
9.1.4 What is the maximum Compressible Ground hazard rating identified on the study site?	Negligible
9.1.5 What is the maximum Collapsible Rocks hazard rating identified on the study site?	Very Low
9.1.6 What is the maximum Running Sand hazard rating identified on the study site?	Very 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 property 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 Are there any coal mining areas within 75m of the study site?	No
10.2 Are there any Non-Coal Mining areas within 50m of the study site boundary?	Yes
10.3 Are there any brine affected areas within 75m of the study site?	No

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.

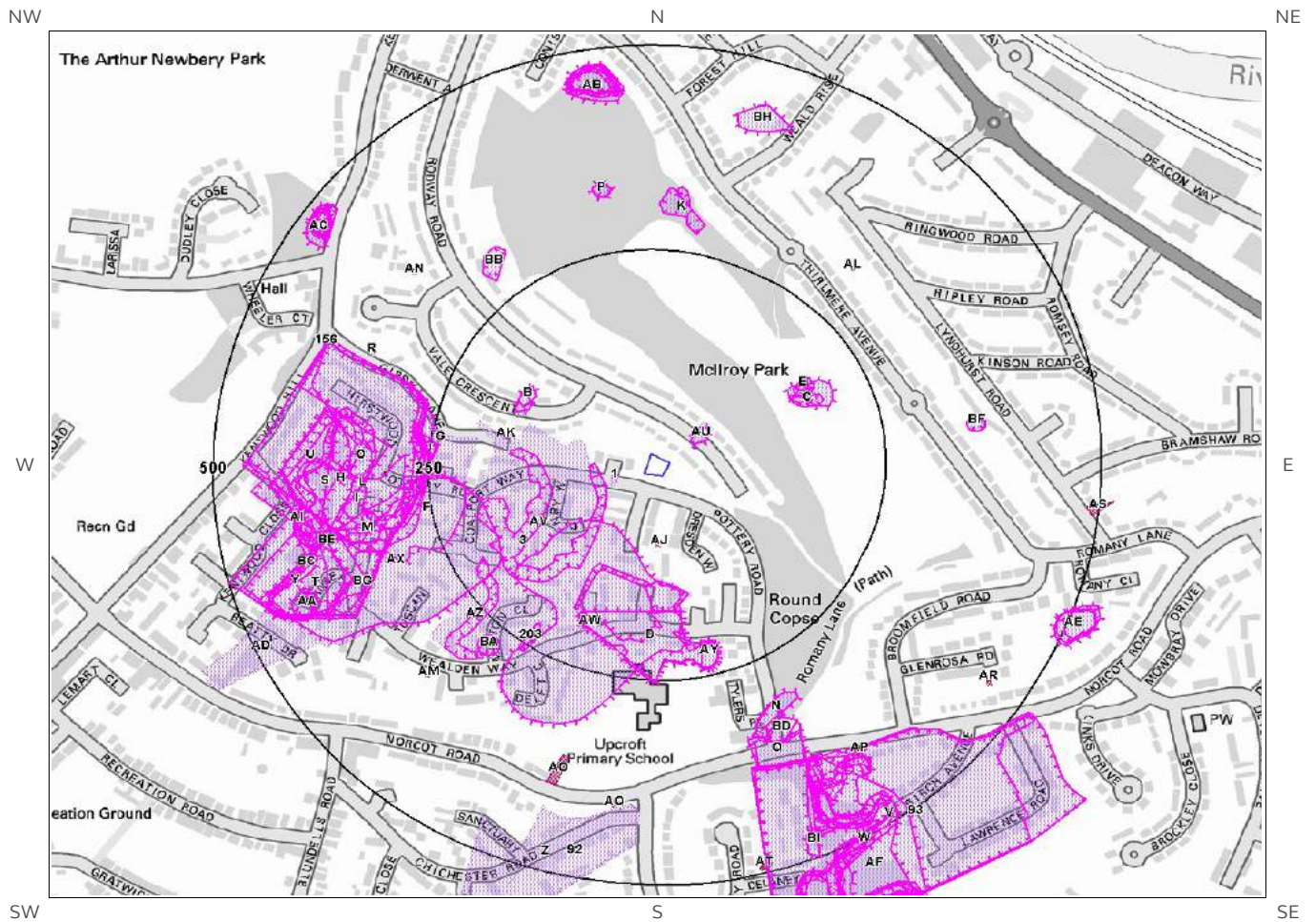
Note: Maps

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).

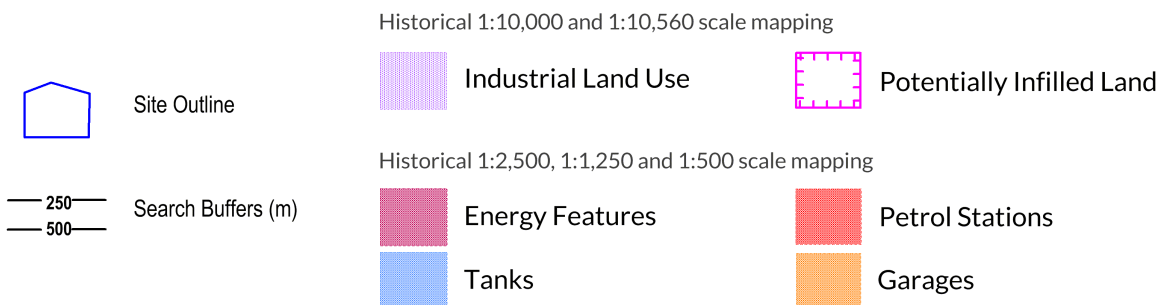
Where a feature is reported in the data tables to a distance greater than the map area, it is noted in the data table as "Not Shown".

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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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: 127

ID	Distance [m]	Direction	Use	Date
1	28	W	Unspecified Kiln	1901
2AU	36	NE	Gravel Pit	1901
3	47	W	Unspecified Commercial/Industrial	1901
4AV	47	W	Unspecified Ground Workings	1901
5AW	74	SW	Clay Pit	1960
6A	122	S	Unspecified Ground Workings	1932
7A	122	S	Unspecified Ground Workings	1938
8	146	W	Railway Sidings	1901
9B	150	NW	Old Gravel Pit	1900
10B	151	W	Old Gravel Pit	1900
11B	152	W	Unspecified Kiln	1878
12C	158	NE	Unspecified Pit	1982
13C	158	NE	Unspecified Pit	1991
14C	158	NE	Unspecified Pit	1974
15C	159	NE	Old Chalk Pit	1900
16D	165	S	Clay Pit	1932
17D	166	S	Clay Pit	1938
18C	168	NE	Old Chalk Pit	1900
19C	170	NE	Sand Pit	1960
20E	173	NE	Unspecified Pit	1932
21E	173	NE	Unspecified Pit	1910
22E	173	NE	Unspecified Pit	1938
23AX	187	SW	Clay Pit	1960
24I	198	W	Unspecified Works	1960
25AY	208	S	Unspecified Pit	1960
26F	208	W	Unspecified Ground Workings	1938
27F	208	W	Unspecified Ground Workings	1932
28AZ	213	SW	Unspecified Ground Workings	1901
29G	236	W	Unspecified Kiln	1900
30G	236	W	Pumping Station	1910

31G	236	W	Pumping Station	1938
32G	236	W	Pumping Station	1932
33H	240	W	Brick Tile and Pottery Works	1910
34J	240	W	Brick and Tile Kilns	1878
35H	241	W	Unspecified Commercial/Industrial	1900
36H	247	W	Unspecified Commercial/Industrial	1900
37L	247	W	Unspecified Ground Workings	1900
38G	250	W	Unspecified Kiln	1900
39AH	251	W	Unspecified Ground Workings	1910
40I	251	W	Unspecified Ground Workings	1900
41BA	264	SW	Unspecified Heap	1901
42J	265	W	Brick Tile and Pottery Works	1938
43J	265	W	Brick Tile and Pottery Works	1932
44K	274	N	Unspecified Pit	1991
45K	274	N	Unspecified Pit	1974
46K	274	N	Unspecified Pit	1982
47BB	278	NW	Old Chalk Pit	1901
48L	278	W	Unspecified Pit	1878
49M	287	W	Railway Sidings	1938
50M	287	W	Railway Sidings	1932
51N	300	SE	Unspecified Pit	1932
52N	300	SE	Unspecified Pit	1932
53N	305	SE	Unspecified Pit	1910
54K	307	N	Unspecified Pit	1938
55K	307	N	Unspecified Pit	1932
56O	318	W	Railway Sidings	1938
57O	318	W	Railway Sidings	1932
58P	319	N	Unspecified Pit	1960
59P	319	N	Unspecified Pit	1932
60P	319	N	Unspecified Pit	1938
61BC	320	W	Brick Kiln	1878
62S	322	W	Clay Pit	1910
63BD	324	SE	Cuttings	1960
64Q	337	S	Cuttings	1960
65Q	341	S	Cuttings	1938
66R	344	W	Unspecified Tank	1910
67R	344	W	Unspecified Tank	1932
68R	344	W	Unspecified Tank	1938
69BG	347	SW	Unspecified Kiln	1878
70BE	347	W	Unspecified Ground Workings	1878

71BF	347	E	Old Chalk Pit	1901
72S	352	W	Railway Sidings	1900
73T	352	SW	Clay Pit	1938
74T	352	SW	Clay Pit	1932
75S	362	W	Railway Sidings	1900
76U	363	W	Unspecified Ground Workings	1932
77U	363	W	Unspecified Ground Workings	1938
78S	363	W	Unspecified Pit	1960
79V	371	S	Brick and Tile Works	1898
80V	372	S	Brick and Tile Works	1910
81X	382	SE	Unspecified Ground Workings	1960
82W	384	SE	Unspecified Pits	1932
83W	384	SE	Unspecified Pits	1932
84X	385	SE	Unspecified Ground Workings	1938
85T	385	W	Unspecified Pit	1900
86X	388	SE	Unspecified Ground Workings	1910
87Y	392	W	Unspecified Ground Workings	1900
88Y	393	W	Unspecified Ground Workings	1910
89Z	402	S	Nursery	1960
90AI	403	W	Unspecified Tank	1878
91Z	404	S	Nursery	1938
92	404	S	Nursery	1932
93	405	SE	Brick and Tile Kiln Works	1898
94X	406	SE	Unspecified Ground Workings	1898
95W	407	SE	Unspecified Ground Workings	1898
96AA	409	W	Unspecified Heaps	1910
97BH	411	N	Old Chalk Pit	1901
98AA	414	W	Unspecified Pit	1878
99AD	426	SW	Telephone Exchange	1982
100AB	434	N	Old Chalk Pit	1900
101AB	439	N	Unspecified Pit	1991
102AB	439	N	Unspecified Pit	1982
103AB	439	N	Unspecified Pit	1974
104AB	440	N	Unspecified Pit	1878
105AB	443	N	Old Chalk Pit	1900
106AB	444	N	Unspecified Pit	1960
107AB	444	N	Old Chalk Pit	1910
108AB	444	N	Unspecified Pit	1932
109AB	444	N	Unspecified Pit	1938
110AC	456	NW	Old Chalk Pit	1900

111AC	456	NW	Old Chalk Pit	1900
112AC	461	NW	Unspecified Pit	1878
113AC	462	NW	Old Chalk Pit	1910
114AC	463	NW	Unspecified Ground Workings	1938
115AC	463	NW	Unspecified Ground Workings	1932
116BI	463	S	Unspecified Ground Workings	1910
117AD	469	SW	Telephone Exchange	1991
118AF	485	SE	Unspecified Pit	1898
119AE	487	SE	Old Gravel Pit	1898
120AE	488	SE	Unspecified Pit	1938
121AE	488	SE	Old Gravel Pit	1898
122AE	488	SE	Old Gravel Pit	1910
123AG	489	SE	Unspecified Ground Workings	1910
124AF	492	SE	Unspecified Ground Workings	1960
125AE	493	SE	Unspecified Pit	1932
126AE	493	SE	Unspecified Pit	1932
127AG	494	SE	Unspecified Ground Workings	1938

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:

7

ID	Distance (m)	Direction	Use	Date
128AH	277	W	Unspecified Tank	1967
129AH	277	W	Unspecified Tank	1961
130AH	277	W	Unspecified Tank	1972
131R	346	W	Unspecified Tank	1912
132R	346	W	Unspecified Tank	1934
133R	346	W	Unspecified Tank	1936
134AI	404	W	Unspecified Tank	1879

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:

45

ID	Distance (m)	Direction	Use	Date
135AJ	81	S	Electricity Substation	1978
136AJ	81	S	Electricity Substation	1993
137AJ	81	S	Electricity Substation	1983
138AK	164	W	Electricity Substation	1978
139AK	164	W	Electricity Substation	1983
140AK	164	W	Electricity Substation	1993
141AL	315	NE	Electricity Substation	1993
142AL	316	NE	Electricity Substation	1983
143AL	316	NE	Electricity Substation	1978
144AM	350	SW	Electricity Substation	1987
145AM	350	SW	Electricity Substation	1993
146AN	350	NW	Electricity Substation	1986
147AN	350	NW	Electricity Substation	1982
148AM	351	SW	Electricity Substation	1982
149AM	351	SW	Electricity Substation	1992
150AN	351	NW	Electricity Substation	1988
151AN	352	NW	Electricity Substation	1994
152AO	356	S	Electricity Substation	1971
153AO	357	S	Electricity Substation	1978
154AO	357	S	Electricity Substation	1969
155AO	357	S	Electricity Substation	1994
156	398	W	Electricity Substation	1971
157AP	399	SE	Electricity Substation	1969
158AP	399	SE	Electricity Substation	1983
159AP	399	SE	Electricity Substation	1978
160AP	399	SE	Electricity Substation	1971
161AP	400	SE	Electricity Substation	1978
162AQ	405	S	Gas Governor	1969
163AQ	405	S	Gas Governor	1983
164AQ	405	S	Gas Governor	1987
165AQ	406	S	Gas Governor	1971
166AQ	406	S	Gas Governor	1967
167AR	448	SE	Electricity Substation	1993
168AR	450	SE	Electricity Substation	1982
169AR	450	SE	Electricity Substation	1993
170AR	452	SE	Electricity Substation	1967
171AS	484	E	Electricity Substation	1960
172AS	484	E	Electricity Substation	1978
173AS	485	E	Electricity Substation	1971
174AS	485	E	Electricity Substation	1969
175AT	488	S	Electricity Substation	1983

176AT	491	S	Electricity Substation
177AT	491	S	Electricity Substation
178AT	492	S	Electricity Substation
179AT	492	S	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: 0

Database searched and no data found.

1.6 Potentially Infilled Land

Records of Potentially Infilled Features from 1:10,000 scale mapping within 500m of the study site: 100

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

ID	Distance(m)	Direction	Use	Date
180AU	36	NE	Gravel Pit	1901
181AV	47	W	Unspecified Ground Workings	1901
182AW	74	SW	Clay Pit	1960
183A	122	S	Unspecified Ground Workings	1932
184A	122	S	Unspecified Ground Workings	1938
185B	150	NW	Old Gravel Pit	1900
186B	151	W	Old Gravel Pit	1900
187C	158	NE	Unspecified Pit	1991
188C	158	NE	Unspecified Pit	1982
189C	158	NE	Unspecified Pit	1974
190C	159	NE	Old Chalk Pit	1900
191D	165	S	Clay Pit	1932
192D	166	S	Clay Pit	1938

193C	168	NE	Old Chalk Pit	1900
194C	170	NE	Sand Pit	1960
195E	173	NE	Unspecified Pit	1938
196E	173	NE	Unspecified Pit	1910
197E	173	NE	Unspecified Pit	1932
198AX	187	SW	Clay Pit	1960
199AY	208	S	Unspecified Pit	1960
200F	208	W	Unspecified Ground Workings	1932
201F	208	W	Unspecified Ground Workings	1938
202AZ	213	SW	Unspecified Ground Workings	1901
203	220	SW	Pond	1901
204H	240	W	Brick Tile and Pottery Works	1910
205J	240	W	Brick and Tile Kilns	1878
206H	247	W	Unspecified Ground Workings	1900
207AH	251	W	Unspecified Ground Workings	1910
208H	251	W	Unspecified Ground Workings	1900
209BA	264	SW	Unspecified Heap	1901
210J	265	W	Brick Tile and Pottery Works	1938
211J	265	W	Brick Tile and Pottery Works	1932
212K	274	N	Unspecified Pit	1974
213K	274	N	Unspecified Pit	1982
214K	274	N	Unspecified Pit	1991
215BB	278	NW	Old Chalk Pit	1901
216I	278	W	Unspecified Pit	1878
217N	300	SE	Unspecified Pit	1932
218N	300	SE	Unspecified Pit	1932
219N	305	SE	Unspecified Pit	1910
220K	307	N	Unspecified Pit	1938
221K	307	N	Unspecified Pit	1932
222P	319	N	Unspecified Pit	1960
223P	319	N	Unspecified Pit	1938
224P	319	N	Unspecified Pit	1932
225BC	320	W	Brick Kiln	1878
226H	322	W	Clay Pit	1910
227BD	324	SE	Cuttings	1960
228Q	337	S	Cuttings	1960
229Q	341	S	Cuttings	1938
230BE	347	W	Unspecified Ground Workings	1878
231BF	347	E	Old Chalk Pit	1901

232BG	350	W	Pond	1910
233T	352	SW	Clay Pit	1932
234T	352	SW	Clay Pit	1938
235U	363	W	Unspecified Ground Workings	1932
236U	363	W	Unspecified Ground Workings	1938
237S	363	W	Unspecified Pit	1960
238V	371	S	Brick and Tile Works	1898
239V	372	S	Brick and Tile Works	1910
240X	382	SE	Unspecified Ground Workings	1960
241W	384	SE	Unspecified Pits	1932
242W	384	SE	Unspecified Pits	1932
243X	385	SE	Unspecified Ground Workings	1938
244T	385	W	Unspecified Pit	1900
245X	388	SE	Unspecified Ground Workings	1910
246T	392	W	Unspecified Ground Workings	1900
247Y	393	W	Unspecified Ground Workings	1910
248X	406	SE	Unspecified Ground Workings	1898
249W	407	SE	Unspecified Ground Workings	1898
250AA	409	W	Unspecified Heaps	1910
251BH	411	N	Old Chalk Pit	1901
252AA	414	W	Unspecified Pit	1878
253AB	434	N	Old Chalk Pit	1900
254AB	439	N	Unspecified Pit	1982
255AB	439	N	Unspecified Pit	1974
256AB	439	N	Unspecified Pit	1991
257AB	440	N	Unspecified Pit	1878
258AB	443	N	Old Chalk Pit	1900
259AB	444	N	Unspecified Pit	1960
260AB	444	N	Old Chalk Pit	1910
261AB	444	N	Unspecified Pit	1932
262AB	444	N	Unspecified Pit	1938
263AC	456	NW	Old Chalk Pit	1900
264AC	456	NW	Old Chalk Pit	1900
265AC	461	NW	Unspecified Pit	1878
266AC	462	NW	Old Chalk Pit	1910
267AC	463	NW	Unspecified Ground Workings	1938
268AC	463	NW	Unspecified Ground Workings	1932
269BI	463	S	Unspecified Ground Workings	1910

270AF	485	SE	Unspecified Pit	1898
271AE	487	SE	Old Gravel Pit	1898
272AE	488	SE	Old Gravel Pit	1898
273AE	488	SE	Old Gravel Pit	1910
274AE	488	SE	Unspecified Pit	1938
275AG	489	SE	Unspecified Ground Workings	1910
276AF	492	SE	Unspecified Ground Workings	1960
277AE	493	SE	Unspecified Pit	1932
278AE	493	SE	Unspecified Pit	1932
279AF	494	SE	Unspecified Ground Workings	1938

2. Environmental Permits, Incidents and Registers Map



- | | | | | | |
|---|--------------------|---|-------------------------------|---|--|
|  | Site Outline |  | Recorded Pollution Incident |  | RAS 3 & 4 Authorisations |
|  | Search Buffers (m) |  | Dangerous Substances (List 1) |  | Part A(1) Authorised Processes and Historic IPC Authorisations |
| | |  | Dangerous Substances (List 2) |  | Part A(2) and Part B Authorised Processes |
| | |  | Water Industry Referrals |  | COMAH / NIHHS Sites |
| | |  | Licenced Discharge Consents |  | Sites Determined as Contaminated Land |
| | |  | Red List Discharge Consents |  | 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:

0

Database searched and no data found.

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:

0

Database searched and no data found.

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:

0

Database searched and no data found.

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:

0

Database searched and no data found.

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

How many 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



- | | | | | | |
|---|---------------------------|---|----------------------------|---|---|
|  | Site Outline |  | EA/NRW Active Landfill |  | Historic and Planned Waste Sites |
|  | EA/NRW Historic Landfill |  | EA/NRW Licensed Waste Site |  | Local Authority/Historical Mapping Landfill Records |
|  | BGS / DoE Survey Landfill | | | | |
-  250 Search Buffers (m)
 500 Search Buffers (m)

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
1	219	NE	467800 174300	Site Address: Beecham Hill, Reading, Berkshire Waste Licence: - Site Reference: TP0304, RDG6 Waste Type: Inert, Industrial Environmental Permitting Regulations (Waste) Reference: - Licence Issue: Licence Surrendered: Licence Holder Address: - Operator: - Licence Holder: - First Recorded: - Last Recorded: -
2	281	N	467700 174400	Site Address: Thirlmere Avenue, Reading, Berkshire Waste Licence: - Site Reference: TP0549, RDG12 Waste Type: Inert, Industrial Environmental Permitting Regulations (Waste) Reference: - Licence Issue: Licence Surrendered: Licence Holder Address: - Operator: - Licence Holder: - First Recorded: - Last Recorded: -

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:

0

Database searched and no data found.

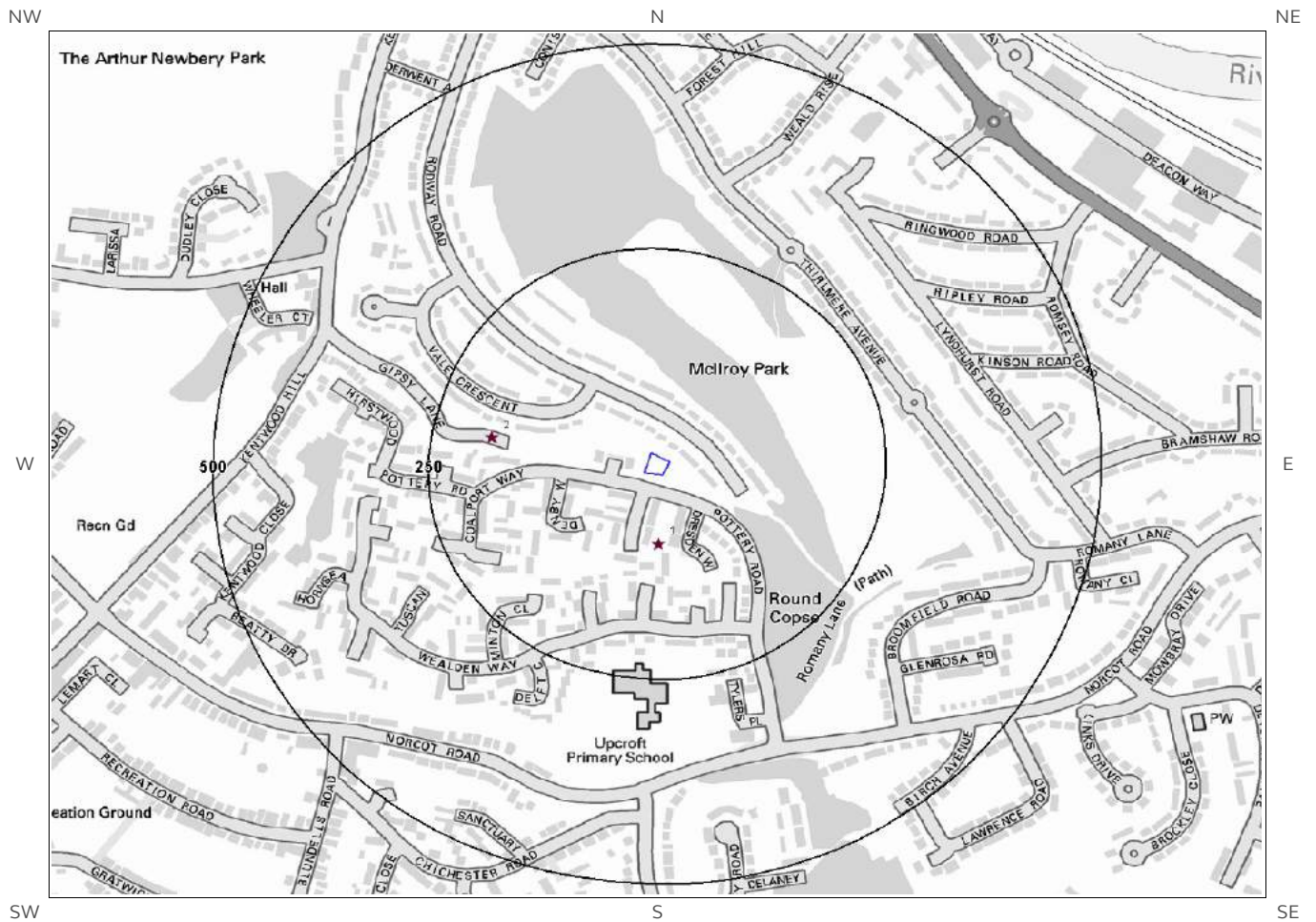
3.2.2 Records of Environment Agency/Natural Resources Wales licensed waste sites within 1500m of the study site:

2

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
3	669	NE	468240 174600	Site Address: 17, Deacon Way, Reading, Berkshire, RG30 6AZ Type: 75kte HCl Waste TS + treatment Size: < 25000 tonnes Environmental Permitting Regulations (Waste) Licence Number: ABS010 EPR reference: EA/EPR/EP3699SA/S002 Operator: A B Skip Hire & Recycling Ltd Waste Management licence No: 101170 Annual Tonnage: 0.0 Issue Date: 18/12/2009 Effective Date: - Modified: - Surrendered Date: 27/05/2016 Expiry Date: - Cancelled Date: - Status: Surrendered Site Name: A B Skip Hire & Recycling Correspondence Address: -
Not shown	942	E	468638 174382	Site Address: I T P, Unit 1, Stadium Way, Tilehurst, Reading, Berkshire, RG30 6BX Type: Household, Commercial & Industrial Waste T Stn Size: < 25000 tonnes Environmental Permitting Regulations (Waste) Licence Number: ITP002 EPR reference: EA/EPR/BB3302TG/A001 Operator: International Technology Products (U K) Limited Waste Management licence No: 401209 Annual Tonnage: 760.0 Issue Date: 02/05/2014 Effective Date: - Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Issued Site Name: I T P Correspondence Address: -

4. Current Land Use Map



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4. Current Land Uses

4.1 Current Industrial Data

Records of potentially contaminative industrial sites within 250m of the study site: 2

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

ID	Distance (m)	Direction	Company	NGR	Address	Activity	Category
1	84	S	Electricity Sub Station	467704 174082	Electricity Sub Station, RG30	Electrical Features	Infrastructure and Facilities
2	182	W	Electricity Sub Station	467511 174212	Electricity Sub Station, RG30	Electrical Features	Infrastructure and Facilities

4.2 Petrol and Fuel Sites

Records of petrol or fuel sites within 500m of the study site: 0

Database searched and no data found.

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
HEAD-XVSZC	HEAD	GRAVEL, SAND, SILT AND CLAY

5.3 Bedrock and Solid Geology

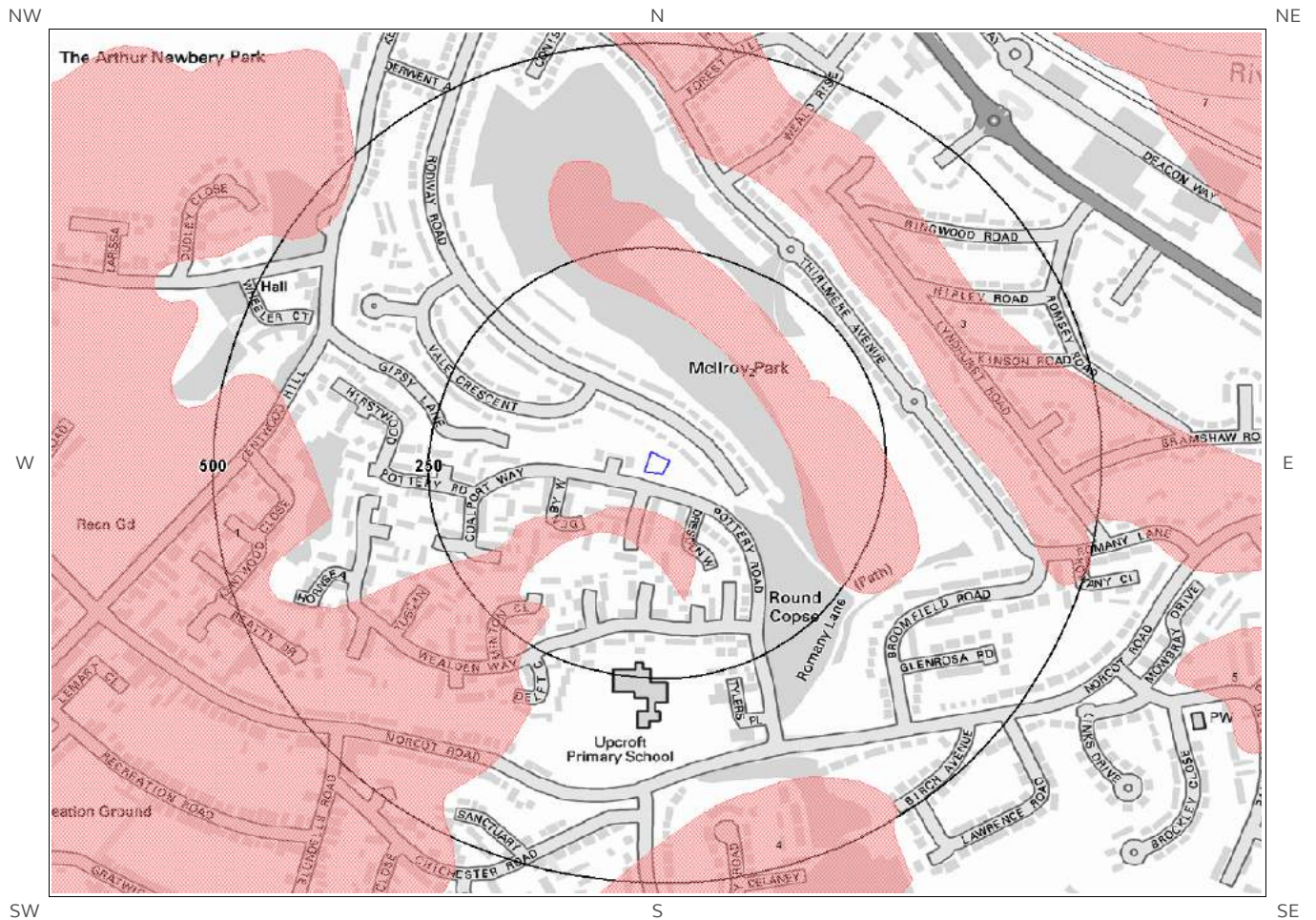
The database has been searched on site, including a 50m buffer.

Lex Code	Description	Rock Type
LMBE-XCZS	LAMBETH GROUP	CLAY, SILT AND SAND
SNCK-CHLK	SEAFORD CHALK FORMATION AND NEWHAVEN CHALK FORMATION (UNDIFFERENTIATED)	CHALK

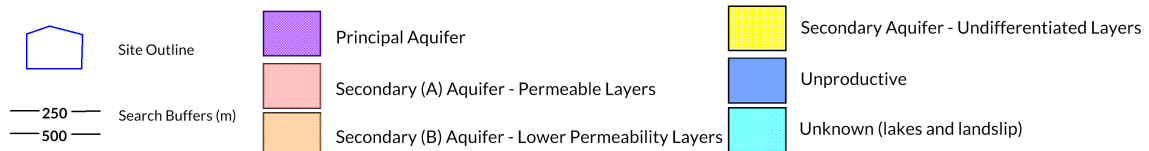
(Derived from the BGS 1:50,000 Digital Geological Map of Great Britain)

6 Hydrogeology and Hydrology

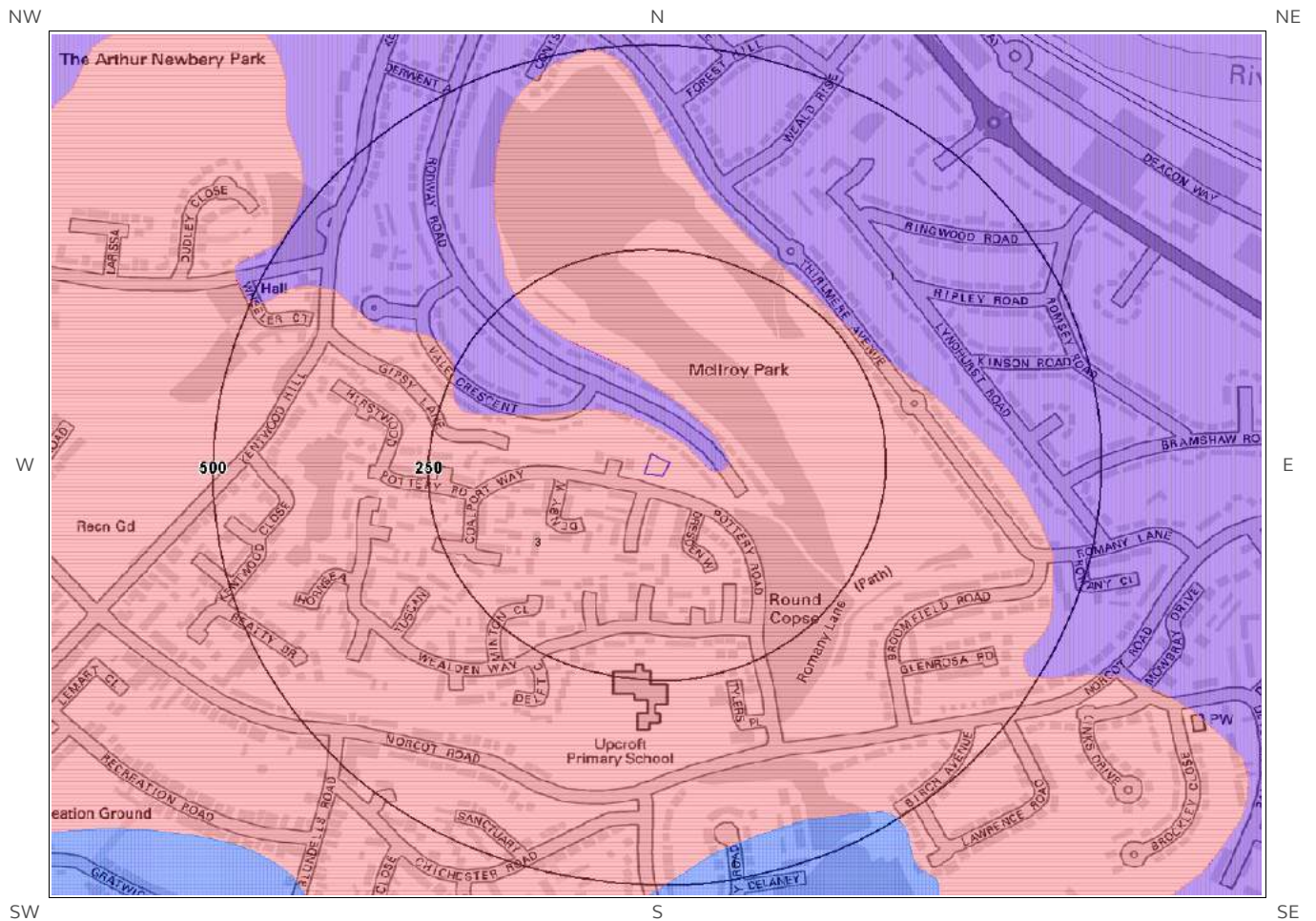
6a. Aquifer Within Superficial Geology



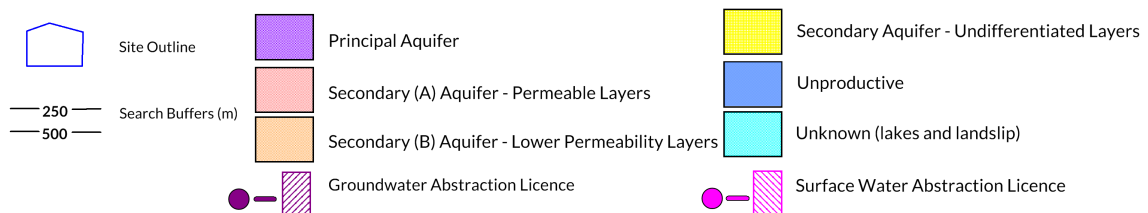
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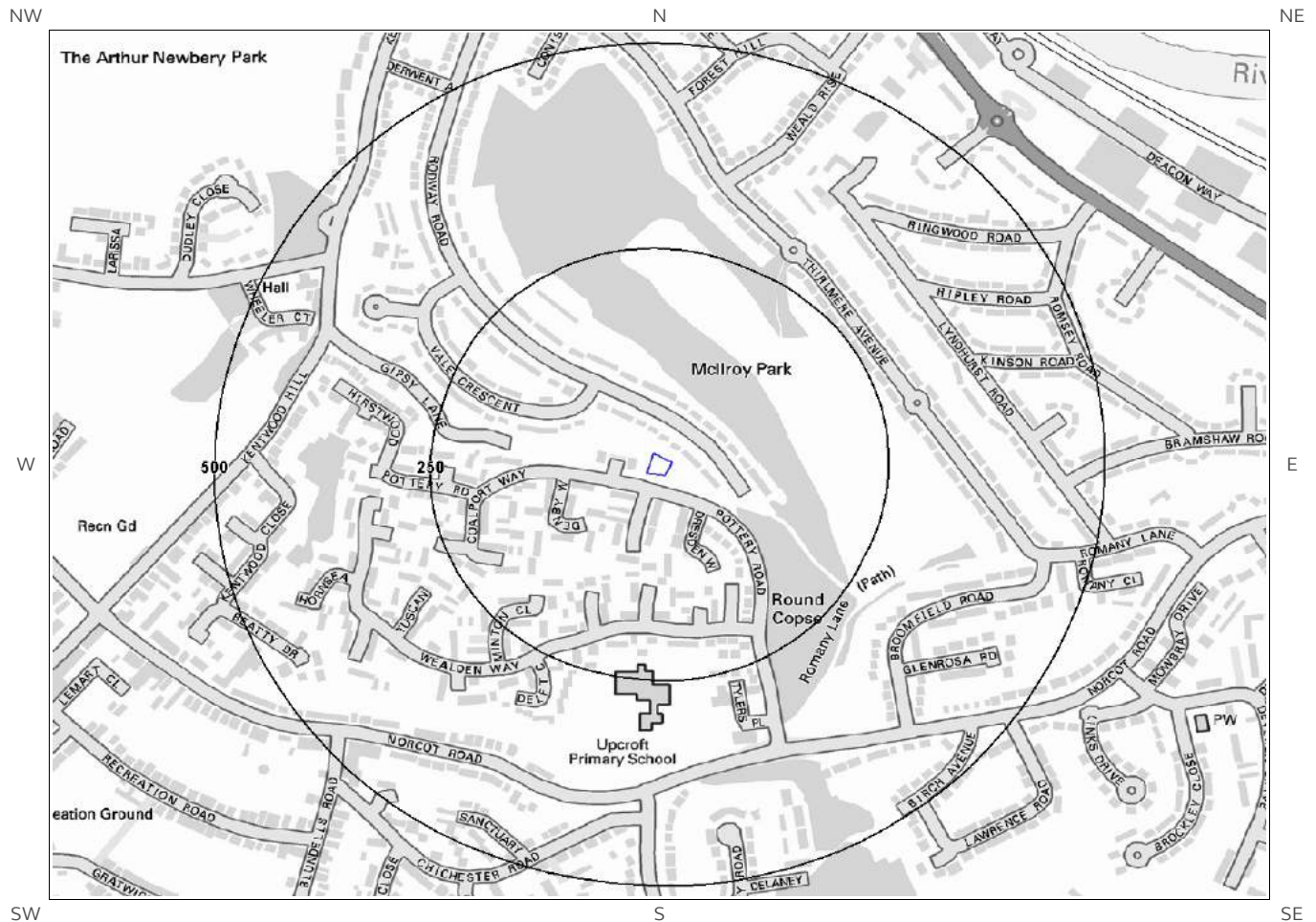
6b. Aquifer Within Bedrock Geology and Abstraction Licenses



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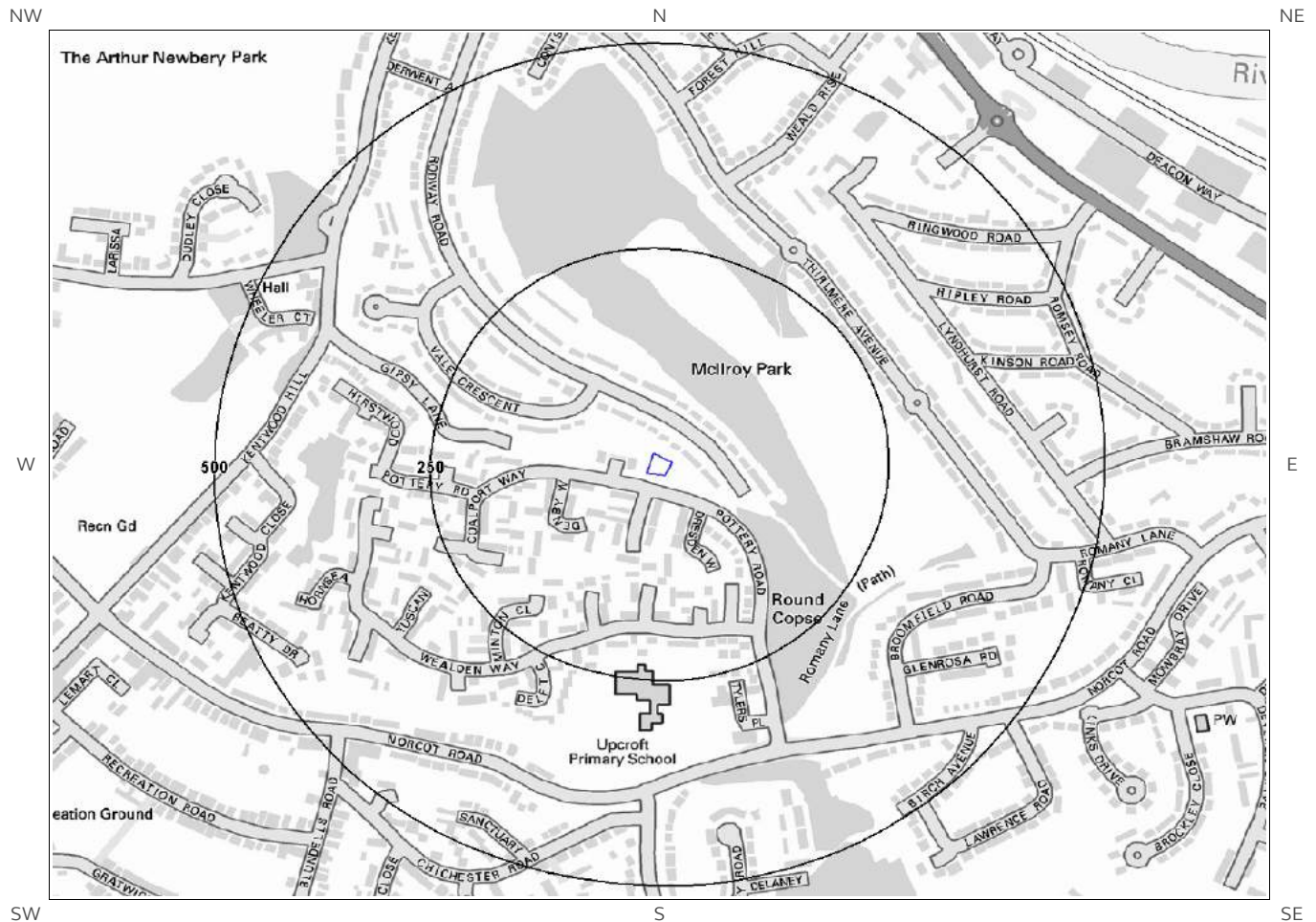


6c. Hydrogeology – Source Protection Zones and Potable Water Abstraction Licenses

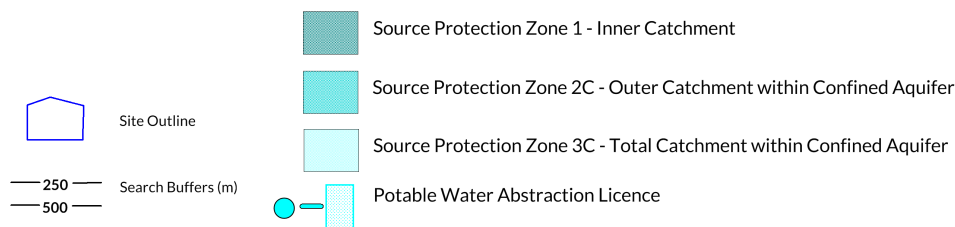


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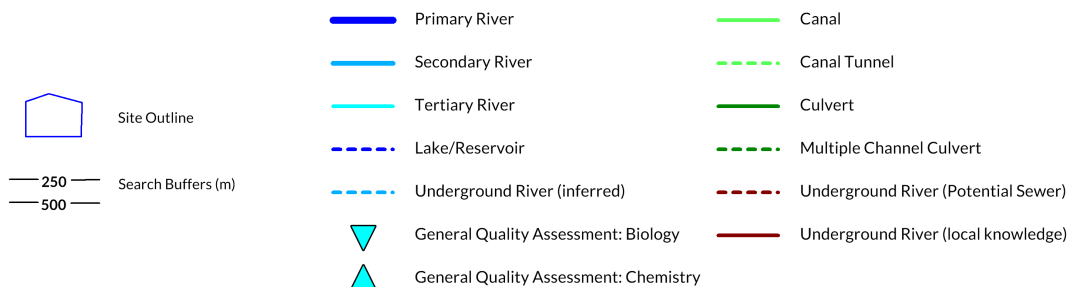
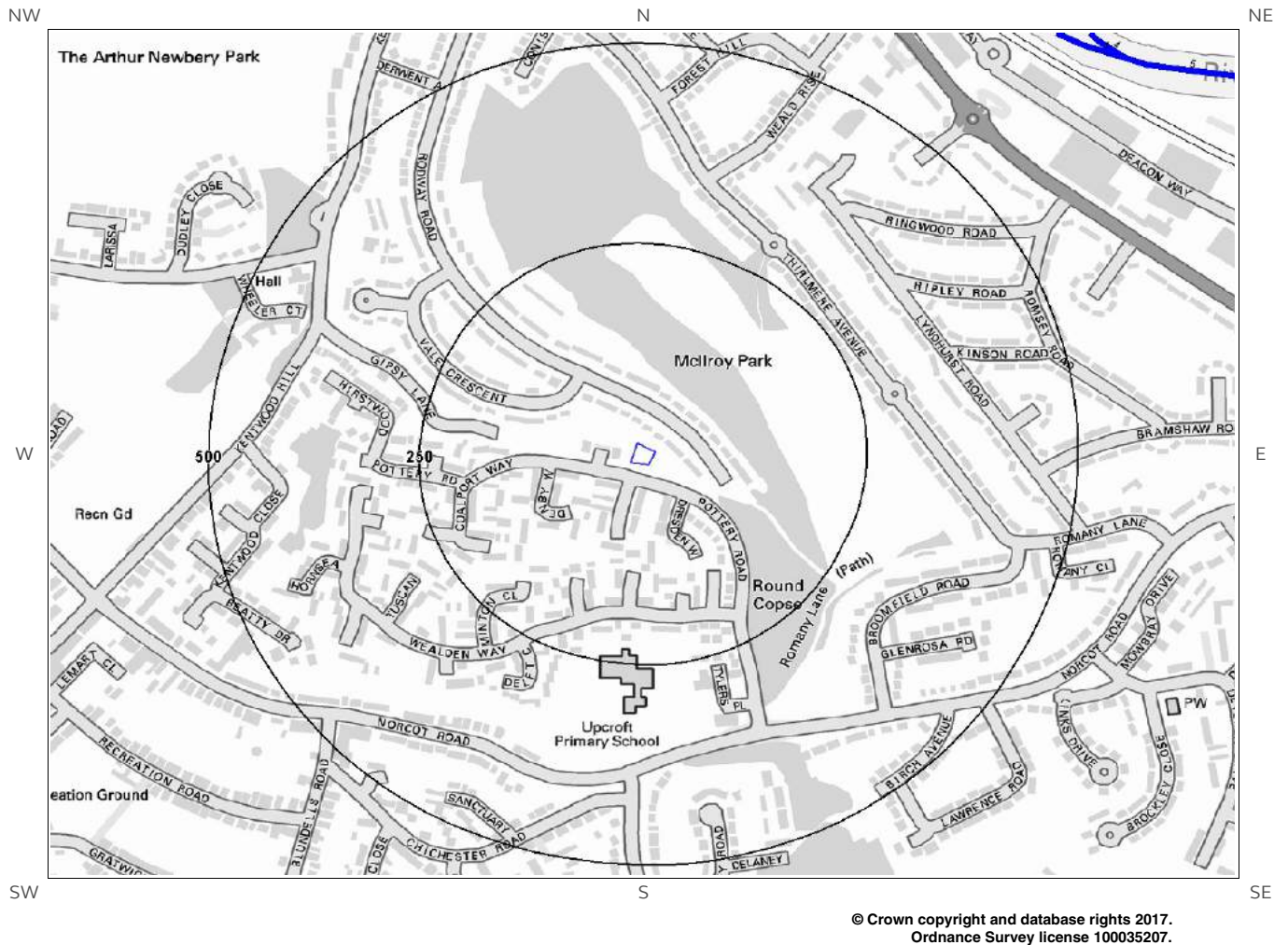
6d. Hydrogeology – Source Protection Zones within confined aquifer



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6e. Hydrology – Detailed River Network and River Quality



6. Hydrogeology and Hydrology

6.1 Aquifer within Superficial Deposits

Are there 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
1	46	S	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers
2	128	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
3	303	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
4	400	S	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

6.2 Aquifer within Bedrock Deposits

Are there 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
3	0	On Site	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers
1	28	NE	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
4	451	S	Unproductive	These are rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow

6.3 Groundwater Abstraction Licences

Are there any Groundwater Abstraction Licences within 2000m of the study site?

Yes

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
Not shown	1032	E	468700 174500	Status: Historical Licence No: 28/39/23/0176 Details: Spray Irrigation - Direct Direct Source: Thames Groundwater Point: Scours Lane, Reading Town F.c, Reading Data Type: Point Name: READING TOWN FOOTBALL CLUB Annual Volume (m³): - Max Daily Volume (m³): - Original Application No: WR.A/6223 Original Start Date: 30/9/1994 Expiry Date: - Issue No: 100 Version Start Date: 30/9/1994 Version End Date:
Not shown	1032	E	468700 174500	Status: Historical Licence No: 28/39/23/0176 Details: Drinking, Cooking, Sanitary, Washing, (Small Garden) - Commercial/Industrial/Public Services Direct Source: Thames Groundwater Point: Scours Lane, Reading Town F.c, Reading Data Type: Point Name: READING TOWN FOOTBALL CLUB Annual Volume (m³): - Max Daily Volume (m³): - Original Application No: WR.A/6223 Original Start Date: 30/9/1994 Expiry Date: - Issue No: 100 Version Start Date: 30/9/1994 Version End Date:
Not shown	1224	E	468900 174500	Status: Historical Licence No: 28/39/23/0131 Details: Drinking, Cooking, Sanitary, Washing, (Small Garden) - Commercial/Industrial/Public Services Direct Source: Thames Groundwater Point: Scours Lane, Reading Data Type: Point Name: PRUDENTIAL IBIS CLUB Annual Volume (m³): - Max Daily Volume (m³): - Original Application No: WR.A/A03/1 Original Start Date: 14/1/1967 Expiry Date: - Issue No: 100 Version Start Date: 1/5/1992 Version End Date:
Not shown	1224	E	468900 174500	Status: Historical Licence No: 28/39/23/0131 Details: Spray Irrigation - Direct Direct Source: Thames Groundwater Point: Scours Lane, Reading Data Type: Point Name: PRUDENTIAL IBIS CLUB Annual Volume (m³): - Max Daily Volume (m³): - Original Application No: WR.A/A03/1 Original Start Date: 14/1/1967 Expiry Date: - Issue No: 100 Version Start Date: 1/5/1992 Version End Date:
Not shown	1444	E	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 (m³): - Max Daily Volume (m³): - 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	1611	N	467800 175800	Status: Active Licence No: 28/39/23/0185 Details: General Farming & Domestic Direct Source: Thames Groundwater Point: Mapledurham, Oxfordshire (d) Data Type: Point Name: THE MAPLEDURHAM 1997 TRUST Annual Volume (m³): 52410 Max Daily Volume (m³): 318.11 Original Application No: - Original Start Date: 20/9/1999 Expiry Date: - Issue No: 1 Version Start Date: 20/9/1999 Version End Date:

ID	Distance (m)	Direction	NGR	Details
Not shown	1611	N	467800 175800	Status: Active Licence No: 28/39/23/0185 Details: Drinking, Cooking, Sanitary, Washing, (Small Garden) - Household Direct Source: Thames Groundwater Point: Mapledurham, Oxfordshire (d) Data Type: Point Name: THE MAPLEDURHAM 1997 TRUST Annual Volume (m³): 52410 Max Daily Volume (m³): 318.11 Original Application No: - Original Start Date: 20/9/1999 Expiry Date: - Issue No: 1 Version Start Date: 20/9/1999 Version End Date:
Not shown	1725	NE	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 (m³): - Max Daily Volume (m³): - 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	1749	NE	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 (m³): - Max Daily Volume (m³): - 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	1782	E	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 (m³): 9819 Max Daily Volume (m³): 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	1811	S	467300 172400	Status: Active Licence No: 28/39/22/0127 Details: Spray Irrigation - Direct Direct Source: Thames Groundwater Point: Calcot Park, Reading Data Type: Point Name: CALCOT PARK GOLF CLUB LTD Annual Volume (m³): 8500 Max Daily Volume (m³): 55 Original Application No: NPS/WR/005700 Original Start Date: 13/6/1966 Expiry Date: - Issue No: 102 Version Start Date: 28/4/2011 Version End Date:
Not shown	1929	NW	466800 175900	Status: Historical Licence No: 28/39/23/0052 Details: General Farming & Domestic Direct Source: Thames Groundwater Point: Purley Gardens, Purley (c) Data Type: Point Name: J A UNWIN & D D UNWIN Annual Volume (m³): - Max Daily Volume (m³): - Original Application No: WR.A/3101 Original Start Date: 6/10/1995 Expiry Date: - Issue No: 100 Version Start Date: 6/10/1995 Version End Date:
Not shown	1994	E	469700 174400	Status: Active Licence No: 28/39/23/0070 Details: General Farming & Domestic Direct Source: Thames Groundwater Point: Little John's Farm, Reading (b) Data Type: Point Name: DRAYTON Annual Volume (m³): 9819 Max Daily Volume (m³): 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	1994	E	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 (m³): 9819 Max Daily Volume (m³): 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:

6.4 Surface Water Abstraction Licences

Are there any Surface Water Abstraction Licences within 2000m of the study site?

Yes

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
Not shown	1306	N	467000 176400	Status: Historical Licence No: 28/39/23/0100 Details: Spray Irrigation - Direct Direct Source: Thames Surface Water - Non Tidal Point: Park Farm, Mapledurham Data Type: Line Name: THE MAPLEDURHAM REVOCABLE LIFE INTEREST TRUST 1997 Annual Volume (m³): - Max Daily Volume (m³): - Application No: WR.A/2436 Original Start Date: 8/5/1967 Expiry Date: - Issue No: 100 Version Start Date: 18/12/1997 Version End Date:
Not shown	1306	N	467000 176400	Status: Historical Licence No: 28/39/23/0100 Details: Spray Irrigation - Direct Direct Source: Thames Surface Water - Non Tidal Point: River Thames At Park Farm, Mapledurham Data Type: Line Name: THE MAPLEDURHAM REVOCABLE LIFE INTEREST TRUST 1997 Annual Volume (m³): - Max Daily Volume (m³): - Application No: WR.A/2436 Original Start Date: 8/5/1967 Expiry Date: - Issue No: 100 Version Start Date: 18/12/1997 Version End Date:
Not shown	1354	N	467010 176470	Status: Active Licence No: 28/39/23/0100 Details: Spray Irrigation - Direct Direct Source: Thames Surface Water - Non Tidal Point: River Thames At Park Farm, Mapledurham Data Type: Line Name: THE MAPLEDURHAM 1997 TRUST Annual Volume (m³): 6819 Max Daily Volume (m³): 455 Application No: - Original Start Date: 8/5/1967 Expiry Date: - Issue No: 101 Version Start Date: 6/10/2003 Version End Date:

6.5 Potable Water Abstraction Licences

Are there any Potable Water Abstraction Licences within 2000m of the study site?

Yes

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
Not shown	1032	E	468700 174500	Status: Historical Licence No: 28/39/23/0176 Details: Drinking, Cooking, Sanitary, Washing, (Small Garden) - Commercial/Industrial/Public Services Direct Source: Thames Groundwater Point: Scours Lane, Reading Town F.c, Reading Data Type: Point Name: READING TOWN FOOTBALL CLUB Annual Volume (m³): - Max Daily Volume (m³): - Original Application No: WR.A/6223 Original Start Date: 30/9/1994 Expiry Date: - Issue No: 100 Version Start Date: Version End Date:

ID	Distance (m)	Direction	NGR	Details
Not shown	1224	E	468900 174500	Status: Historical Licence No: 28/39/23/0131 Details: Drinking, Cooking, Sanitary, Washing, (Small Garden) - Commercial/Industrial/Public Services Direct Source: Thames Groundwater Point: Scours Lane, Reading Data Type: Point Name: PRUDENTIAL IBIS CLUB Annual Volume (m³): - Max Daily Volume (m³): - Original Application No: WR.A/A03/1 Original Start Date: 14/1/1967 Expiry Date: - Issue No: 100 Version Start Date: Version End Date:
Not shown	1611	N	467800 175800	Status: Active Licence No: 28/39/23/0185 Details: Drinking, Cooking, Sanitary, Washing, (Small Garden) - Household Direct Source: Thames Groundwater Point: Mapledurham, Oxfordshire (d) Data Type: Point Name: THE MAPLEDURHAM 1997 TRUST Annual Volume (m³): 52410 Max Daily Volume (m³): 318.11 Original Application No: - Original Start Date: 20/9/1999 Expiry Date: - Issue No: 1 Version Start Date: Version End Date:

6.6 Source Protection Zones

Are there any Source Protection Zones within 500m of the study site?

No

Database searched and no data found.

6.7 Source Protection Zones within Confined Aquifer

Are there any Source Protection Zones within the Confined Aquifer within 500m of the study site?

No

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

Is there any Environment Agency/Natural Resources Wales information on groundwater vulnerability and soil leaching potential within 500m of the study site? Yes

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.
46	S	Minor Aquifer/High Leaching Potential	HU	Soil information for urban areas and restored mineral workings. These soils are therefore assumed to be highly permeable in the absence of site-specific information.

6.9 River Quality

Is there any Environment Agency/Natural Resources Wales information on river quality within 1500m of the study site? No

6.9.1 Biological Quality:

Database searched and no data found.

6.9.2 Chemical Quality:

Database searched and no data found.

6.10 Detailed River Network

Are there any Detailed River Network entries within 500m of the study site? No

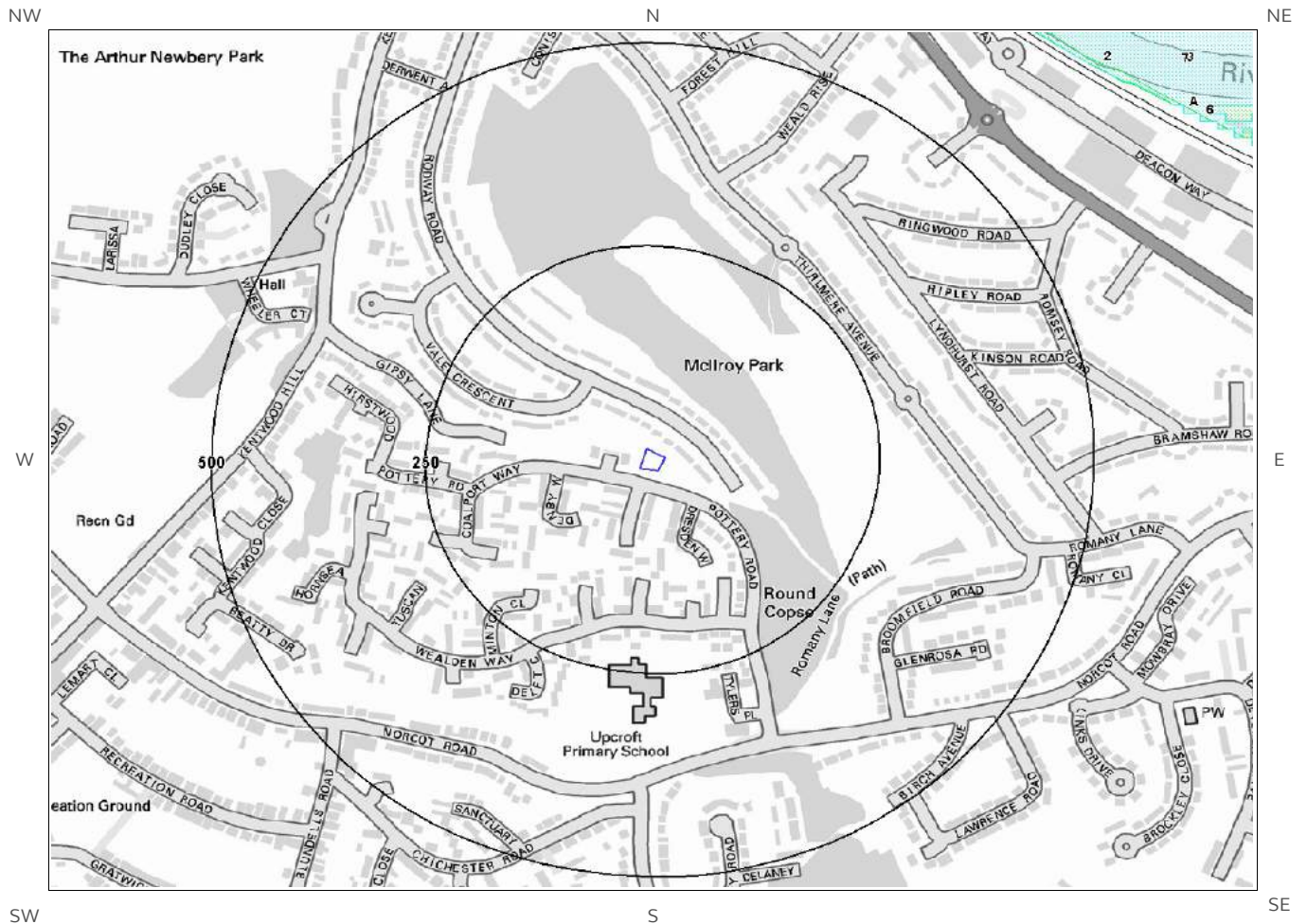
Database searched and no data found.

6.11 Surface Water Features

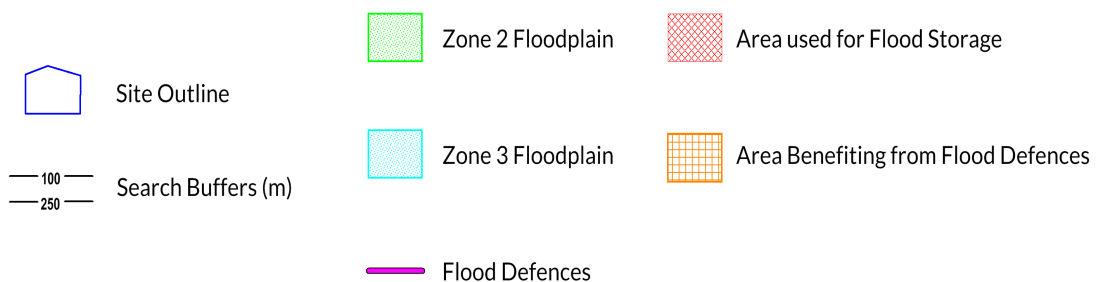
Are there any surface water features within 250m of the study site? No

Database searched and no data found.

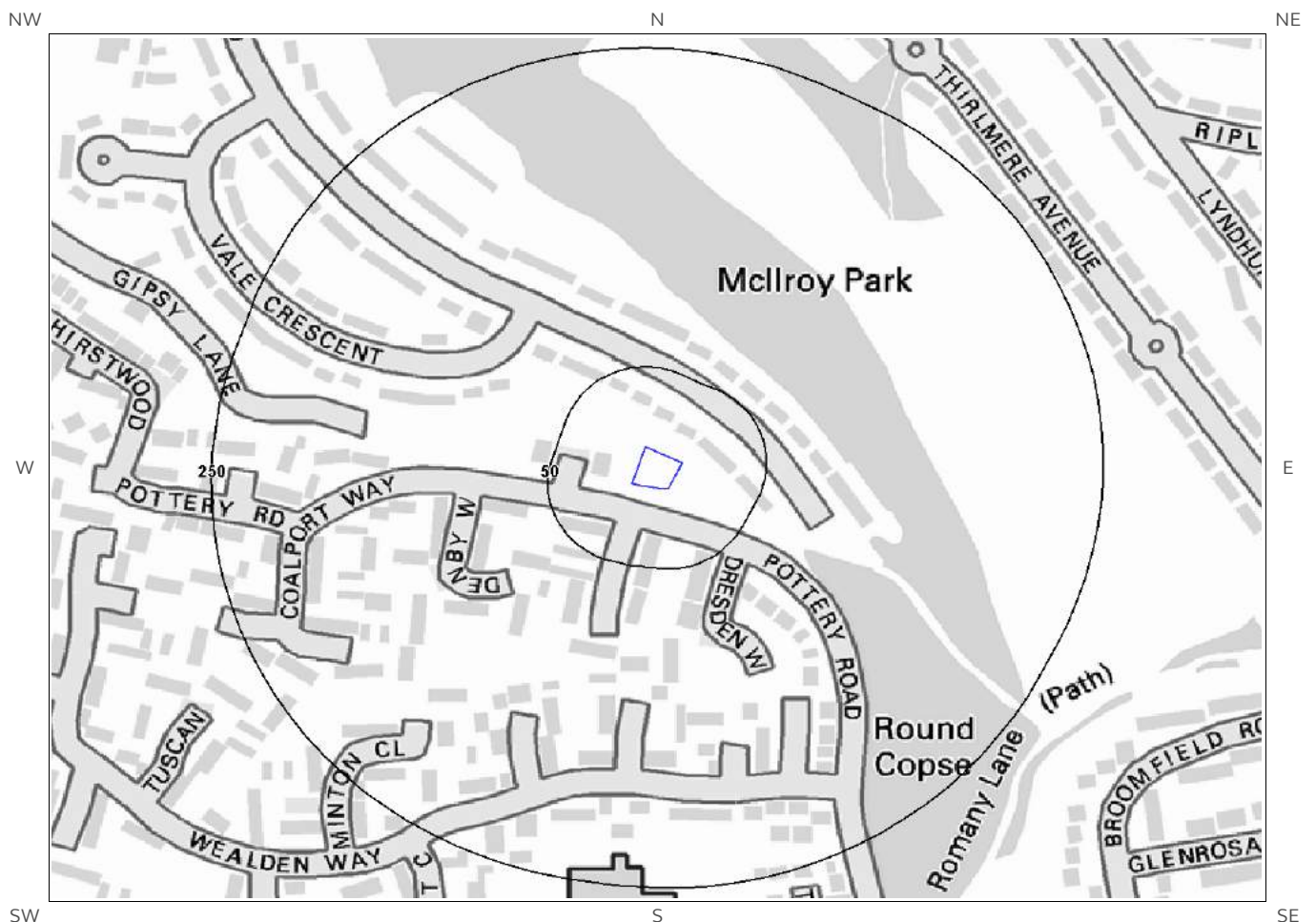
7a. Environment Agency/Natural Resources Wales Flood Map for Planning (from rivers and the sea)



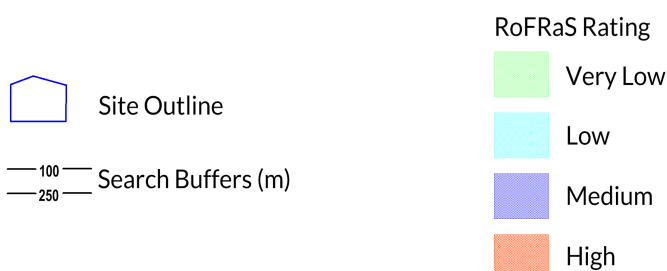
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7b. Environment Agency/Natural Resources Wales Risk of Flooding from Rivers and the Sea (RoFRaS) Map



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7 Flooding

7.1 River and Coastal Zone 2 Flooding

Is the site within 250m of an Environment Agency/Natural Resources Wales Zone 2 floodplain? No

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:

Database searched and no data found.

7.2 River and Coastal Zone 3 Flooding

Is the site within 250m of an Environment Agency/Natural Resources Wales Zone 3 floodplain? No

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.

Database searched and no data found.

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

What is the highest risk of flooding onsite? Very 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 Very Low (less than 1 in 1000) chance of flooding in any given year.

7.4 Flood Defences

Are there any Flood Defences within 250m of the study site? No
Database searched and no data found.

7.5 Areas benefiting from Flood Defences

Are there any areas benefiting from Flood Defences within 250m of the study site? No

7.6 Areas benefiting from Flood Storage

Are there any areas used for Flood Storage within 250m of the study site?

No

7.7 Groundwater Flooding Susceptibility Areas

7.7.1 Are there any British Geological Survey groundwater flooding susceptibility areas within 50m of the boundary of the study site? Yes

Does this relate to 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 What is the highest susceptibility to groundwater flooding in the search area based on the underlying geological conditions?

Limited potential

Where limited potential for groundwater flooding to occur is indicated, this means that although given the geological conditions there may be a groundwater flooding hazard, unless other relevant information, e.g. records of previous flooding, suggests groundwater flooding has occurred before in this area, you need take no further action in relation to groundwater flooding hazard.

7.8 Groundwater Flooding Confidence Areas

What is the British Geological Survey confidence rating in this result?

High

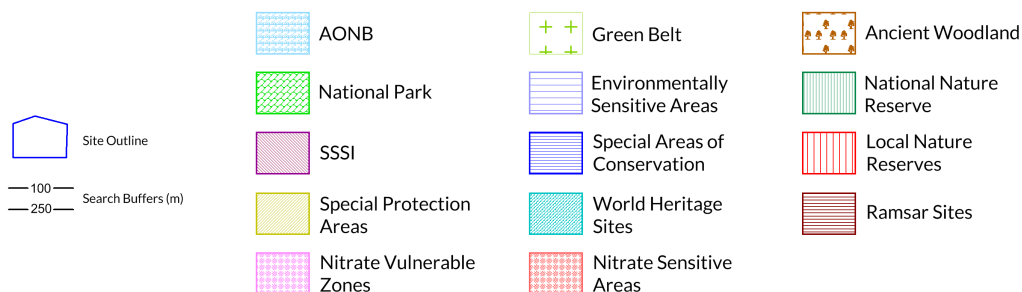
Notes: Groundwater flooding is defined as the emergence of groundwater at the ground surface or the rising of groundwater into man-made ground under conditions where the normal range of groundwater levels is exceeded.

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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8. Designated Environmentally Sensitive Sites

Presence of Designated Environmentally Sensitive Sites within 2000m of the study site? Yes

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:

8

The following records of Designated Ancient Woodland provided by Natural England/Natural Resources Wales are represented as polygons on the Designated Environmentally Sensitive Sites Map:

ID	Distance (m)	Direction	Ancient Woodland Name	Data Source
10	219	NW	UNKNOWN	Ancient and Semi-Natural Woodland
Not shown	1433	S	UNKNOWN	Ancient and Semi-Natural Woodland
Not shown	1704	NE	UNKNOWN	Ancient Replanted Woodland
Not shown	1792	W	UNKNOWN	Ancient Replanted Woodland
Not shown	1878	W	UNKNOWN	Ancient and Semi-Natural Woodland
Not shown	1924	SW	UNKNOWN	Ancient and Semi-Natural Woodland
Not shown	1965	W	UNKNOWN	Ancient Replanted Woodland
Not shown	1979	W	UNKNOWN	Ancient and Semi-Natural Woodland

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

6

The following Local Nature Reserve (LNR) records provided by Natural England/Natural Resources Wales are represented as polygons on the Designated Environmentally Sensitive Sites Map:

ID	Distance (m)	Direction	LNR Name	Data Source
1	75	NE	McIlroy Park	Natural England
2	89	SE	Round Copse	Natural England
3	361	S	Lousehill Copse	Natural England
4	489	SE	Lousehill Copse	Natural England
5	576	S	Blundells Copse	Natural England
6	1177	SE	Lousehill Copse	Natural England

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:

2

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
Not shown	1681	NE	Chilterns	Natural England
Not shown	1891	W	North Wessex Downs	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:

1

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
7	0	On Site	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

What is the maximum Shrink-Swell* 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
Ground conditions predominantly high plasticity. Do not plant or remove trees or shrubs near to buildings without expert advice about their effect and management. For new build, consideration should be given to advice published by the National House Building Council (NHBC) and the Building Research Establishment (BRE). There is a probable increase in construction cost to reduce potential shrink-swell problems. For existing property, there is a probable increase in insurance risk during droughts or where vegetation with high moisture demands is present.

9.1.2 Landslides

What is the maximum Landslide* 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 slope instability problems after major changes in ground conditions. Consideration should be given to stability if changes to drainage or excavations take place. Possible increase in construction cost to reduce potential slope stability problems. Existing property no significant increase in insurance risk due to natural slope instability problems.

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

9.1.3 Soluble Rocks

What is the maximum Soluble Rocks* 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
Very significant soluble rocks are present, with a moderate possibility of local natural subsidence due to high surface or subsurface water flow. Do not load the land or undertake building work before obtaining specialist advice. Do not dispose of drainage to the ground. Some possibility groundwater pollution. Maintain drainage infrastructure. For new build specialist site investigation and stability assessment may be necessary before construction. Construction work may cause subsidence. Increased construction costs are likely. For existing property probable increase in insurance risk due to soluble rocks.

9.1.4 Compressible Ground

What is the maximum Compressible Ground* hazard rating identified on the study site?

Negligible

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

Hazard
No indicators for compressible deposits identified. No special actions required to avoid problems due to compressible deposits. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with compressible deposits.

9.1.5 Collapsible Rocks

What is the 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

What is the maximum Running Sand** 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
Very low potential for running sand problems if water table rises or if sandy strata are exposed to water. No special actions required, to avoid problems due to running sand. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with running sand.

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 property is not in a Radon Affected Area, as less than 1% of properties are above the Action Level.

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.

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

10. Mining

10.1 Coal Mining

Are there any coal mining areas within 75m of the study site? No

Database searched and no data found.

10.2 Non-Coal Mining

Are there any Non-Coal Mining areas within 50m of the study site boundary? Yes

The following non-coal mining information is provided by the BGS:

Distance (m)	Direction	Name	Commodity	Assessment of likelihood
0.0	On Site	Not available	Chalk	Localised small scale underground mining may have occurred. Potential for difficult ground conditions are unlikely or localised and are at a level where they need not be considered

Past underground mine workings may occur. The rock types present in these areas are such that small mineral veins may be present on which it is possible that small scale mining has been undertaken and/or it is possible that limited underground extraction of other materials may have occurred. All such occurrences are likely to be of minor localised extent and infrequent. It should be noted, however, that there is always the possibility of the existence of other sub-surface excavations, such as wells, cess pits, follies, air raid shelters/bunkers and other military structures etc. that could affect surface ground stability but which are outside the scope of this dataset. However, if in a coalfield area you should still consider a Coal Authority mining search for the area of interest.

10.3 Brine Affected Areas

Are there any brine affected areas within 75m of the study site? No

Guidance: No Guidance Required.

Contact Details

Groundsure Helpline
Telephone: 08444 159 000
info@groundsure.com



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Authority: Reading Borough Council
Phone: 0118 937 3787
Web: <http://beta.reading.gov.uk/>
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Gemapping PLC
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<https://www.groundsure.com/terms-and-conditions-sept-2016>

Ground and Water Limited
15, Bow Street,
Alton, GU34 1NY

Groundsure Reference: HMD-445-3838620

Your Reference: GWPR1993

Report Date 28 Apr 2017

Report Delivery Method: Email - pdf

Groundsure Geo Insight

Address: Land at Gypsy Lane Rear of 246 - 250 RODWAY ROAD, READING, RG30 6EG

Dear Sir/ Madam,

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

If you need any further assistance, please do not hesitate to contact our helpline on 08444 159000 quoting the above Groundsure reference number.

Yours faithfully,



Managing Director
Groundsure Limited

Enc.
Groundsure Geo Insight

Groundsure Geo Insight

Address: Land at Gypsy Lane Rear of 246 - 250 RODWAY ROAD, READING, RG30 6EG

Date: 28 Apr 2017

Reference: HMD-445-3838620

Client: Ground and Water Limited

NW N NE

W E



SW S SE

Aerial Photograph Capture date: 20-Apr-2015
Grid Reference: 467701,174177
Site Size: 0.05ha

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Overview of Findings

The Groundsure Geo Insight provides high quality geo-environmental information that allows geo-environmental professionals and their clients to make informed decisions and be forewarned of potential ground instability problems that may affect the ground investigation, foundation design and possibly remediation options that could lead to possible additional costs.

The report is based on the BGS 1:50,000 and 1:10,000 Digital Geological Map of Great Britain, BGS Geosure data; BRITPITS database; Non-coal mining data and Borehole Records, Coal Authority data including brine extraction areas, PBA non-coal mining and natural cavities database, Johnson Poole and Bloomer mining data and Groundsure's unique database including historical surface ground and underground workings.

For further details on each dataset, please refer to each individual section in the 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: Geology 1:10,000 Scale

1.1 Artificial Ground	1.1 Is there any Artificial Ground/ Made Ground present beneath the study site at 1:10,000 scale?	No
1.2 Superficial Geology and Landslips	1.2.1 Is there any Superficial Ground/Drift Geology present beneath the study site at 1:10,000 scale?*	No
	1.2.2 Are there any records of landslide within 500m of the study site boundary at 1:10,000 scale?	No
1.3 Bedrock, Solid Geology and Faults	1.3.1 For records of Bedrock and Solid Geology beneath the study site* see the detailed findings section.	
	1.3.2 Are there any records of faults within 500m of the study site boundary at 1:10,000 scale?	No

Section 2: Geology 1:50,000 Scale

2.1 Artificial Ground	2.1.1 Is there any Artificial Ground/ Made Ground present beneath the study site?	No
	2.1.2 Are there any records relating to permeability of artificial ground within the study site*boundary?	No
2.2 Superficial Geology and Landslips	2.2.1 Is there any Superficial Ground/Drift Geology present beneath the study site?*	Yes
	2.2.2 Are there any records of permeability of superficial ground within 500m of the study site?	Yes
	2.2.3 Are there any records of landslide within 500m of the study site boundary?	No
	2.2.4 Are there any records relating to permeability of landslips within the study site* boundary?	No

Section 2: Geology 1:50,000 Scale

2.3 Bedrock, Solid Geology and Faults

2.3.1 For records of Bedrock and Solid Geology beneath the study site* see the detailed findings section.

2.3.2 Are there any records relating to permeability of bedrock ground within the study site boundary?

Yes

2.3.3 Are there any records of faults within 500m of the study site boundary?

No

Section 3: Radon

3. Radon

3.1 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 property is not in a Radon Affected Area, as less than 1% of properties are above the Action Level.

3.2 Radon Protection

No radon protective measures are necessary.

Section 4: Ground Workings

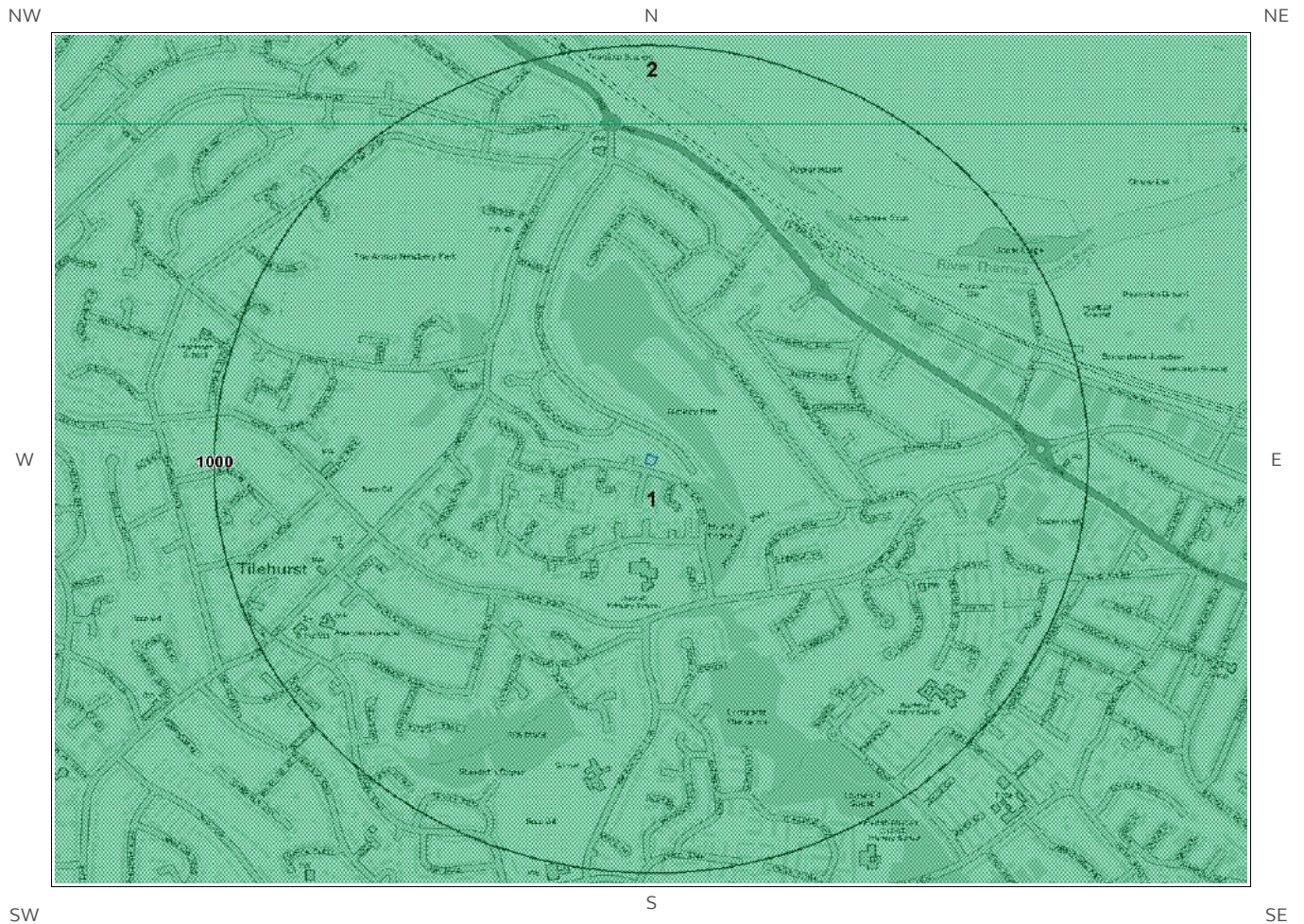
	On-site	0-50m	51-250	251-500	501-1000
4.1 Historical Surface Ground Working Features from Small Scale Mapping	0	2	22	Not Searched	Not Searched
4.2 Historical Underground Workings from Small Scale Mapping	0	0	0	0	0
4.3 Current Ground Workings	0	0	4	6	12

Section 5: Mining, Extraction & Natural Cavities

	On-site	0-50m	51-250	251-500	501-1000
5.1 Historical Mining	0	0	0	0	0
5.2 Coal Mining	0	0	0	0	0
5.3 Johnson Poole and Bloomer Mining Area	0	0	0	0	0
5.4 Non-Coal Mining*	1	0	2	0	3
5.5 Non-Coal Mining Cavities	0	0	1	2	1
5.5 Natural Cavities	0	0	0	1	1

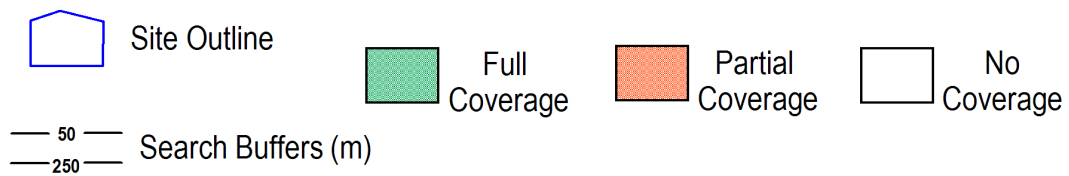
Section 5: Mining, Extraction & Natural Cavities	On-site	0-50m	51-250	251-500	501-1000
5.6 Brine Extraction	0	0	0	0	0
5.7 Gypsum Extraction	0	0	0	0	0
5.8 Tin Mining	0	0	0	0	0
5.9 Clay Mining	0	0	0	0	0
Section 6: Natural Ground Subsidence	On-site				
6.1 Shrink-Swell Clay	Moderate				
6.2 Landslides	Low				
6.3 Ground Dissolution of Soluble Rocks	Moderate				
6.4 Compressible Deposits	Negligible				
6.5 Collapsible Deposits	Very Low				
6.5 Running Sand	Very Low				
Section 7: Borehole Records	On-site	0-50m	51-250		
7 BGS Recorded Boreholes	0	0	9		
Section 8: Estimated Background Soil Chemistry	On-site	0-50m	51-250		
8 Records of Background Soil Chemistry	1	2	0		
Section 9: Railways and Tunnels	On-site	0-50m	51-250	250-500	
9.1 Tunnels	0	0	0	Not Searched	
9.2 Historical Railway and Tunnel Features	0	0	1	Not Searched	
9.3 Historical Railways	0	0	0	Not Searched	
9.4 Active Railways	0	0	0	Not Searched	
9.5 Railway Projects	0	0	0	0	

1:10,000 Scale Availability



1_10,000 Availability Legend

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Availability of 1:10,000 Scale Geology Mapping

The following information represents the availability of the key components of the 1:10,000 scale geological data.

ID	Distance	Artificial Coverage	Superficial Coverage	Bedrock Coverage	Mass Movement Coverage
1	0.0	Some deposits are mapped	Full	Full	No coverage
2	808.0	Some deposits are mapped	Full	Full	No coverage

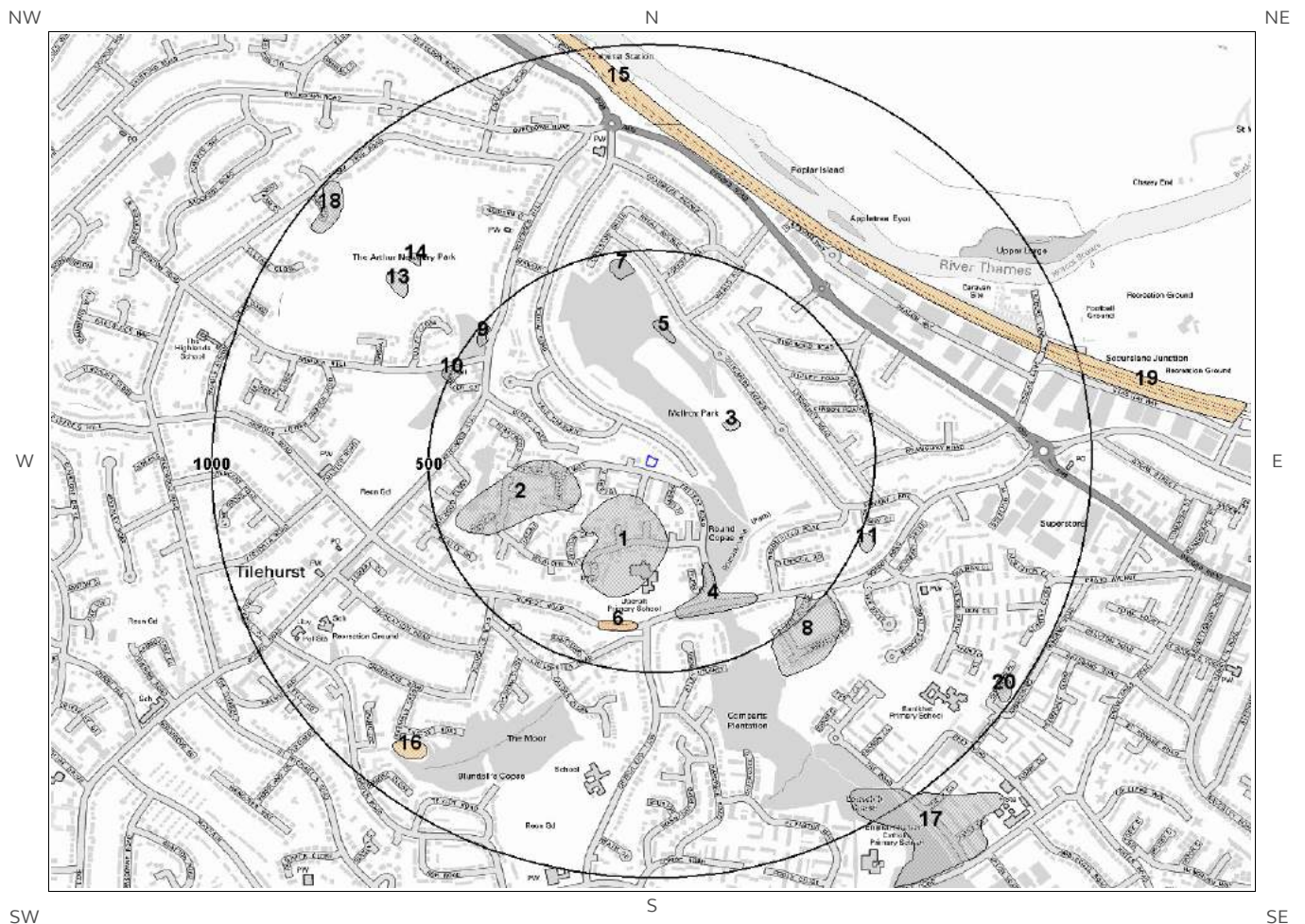
Guidance: The 1:10,000 scale geological interpretation is the most detailed generally available from BGS and is the scale at which most geological surveying is carried out in the field. The database is presented as four types of geology (artificial, mass movement, superficial and bedrock), although not all themes are mapped or available on every map sheet. Therefore a coverage layer showing the availability of the four themes is presented above.

The definitions of coverage are as follows:

Geology	Full Coverage	Partial Coverage	No Coverage
Bedrock	The whole tile has been mapped	Some but not all the tile has been mapped	No coverage
Superficial	The whole tile has been mapped	Some but not all of the tile has been mapped	No coverage
Artificial	Some deposits are mapped on this tile	-	No deposits are mapped
Mass Movement	Some deposits are mapped on this tile	-	No coverage

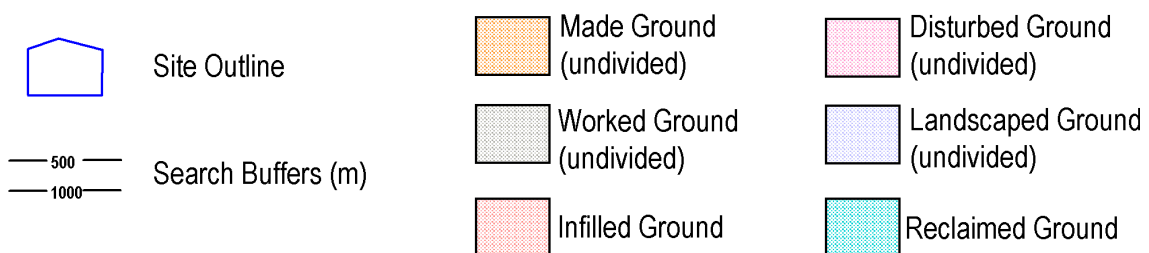
1 Geology (1:10,000 scale).

1.1 Artificial Ground Map (1:10,000 scale)



Artificial Ground Legend

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1. Geology 1:10,000 scale

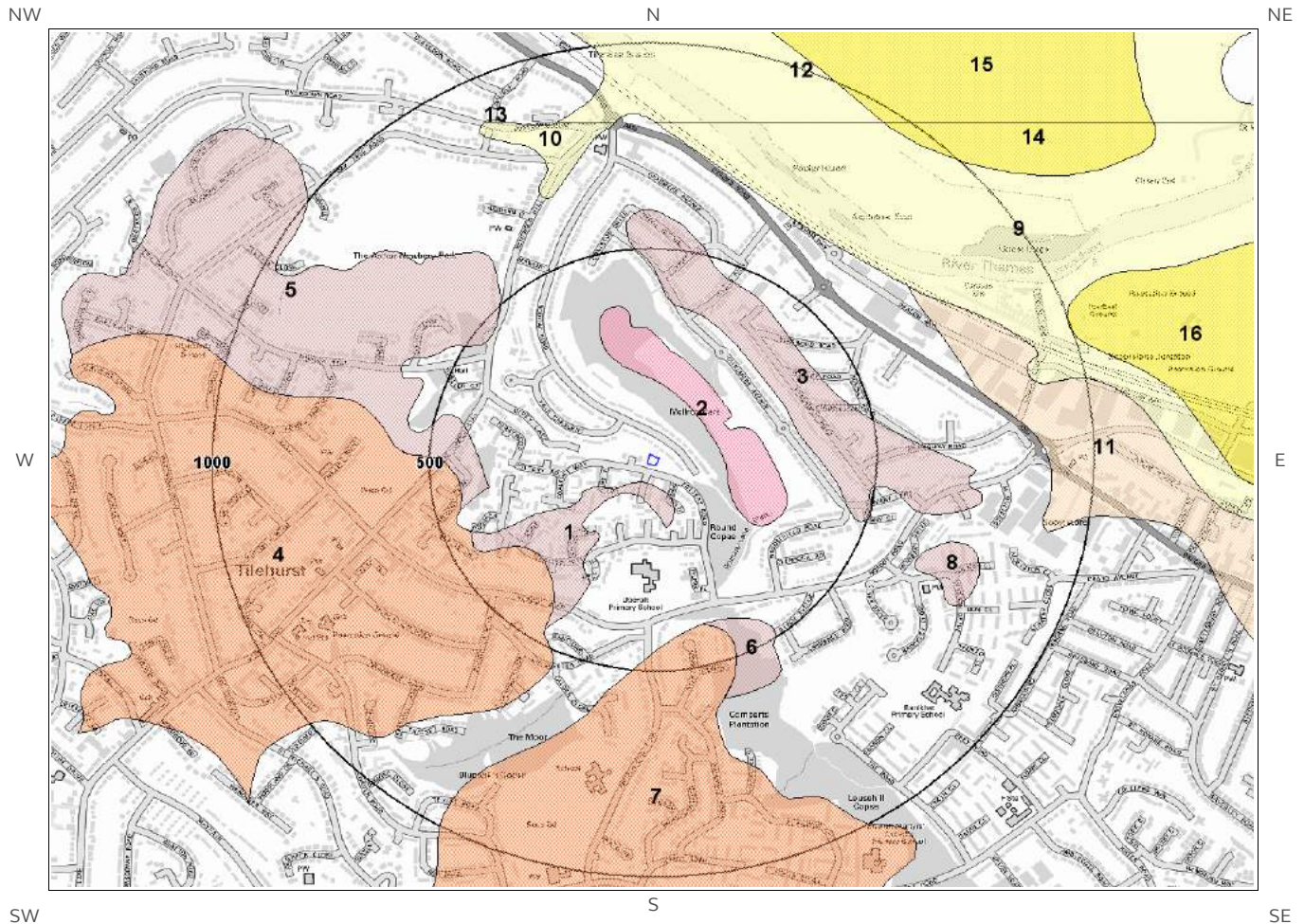
1.1 Artificial Ground

The following geological information represented on the mapping is derived from 1:10,000 scale BGS Geological mapping.

Are there any records of Artificial/ Made Ground within 500m of the study site boundary at 1:10,000 scale? Yes

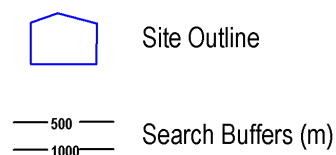
ID	Distance	Direction	LEX Code	Description	Rock Description
1	79.0	S	WGR-VOID	Worked Ground (Undivided)	Void
2	162.0	W	WGR-VOID	Worked Ground (Undivided)	Void
3	170.0	NE	WGR-VOID	Worked Ground (Undivided)	Void
4	260.0	SE	WGR-VOID	Worked Ground (Undivided)	Void
5	280.0	N	WGR-VOID	Worked Ground (Undivided)	Void
6	379.0	S	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit
7	434.0	N	WGR-VOID	Worked Ground (Undivided)	Void
8	454.0	SE	WGR-VOID	Worked Ground (Undivided)	Void
9	465.0	NW	WGR-VOID	Worked Ground (Undivided)	Void
10	478.0	NW	WGR-VOID	Worked Ground (Undivided)	Void
11	499.0	E	WGR-VOID	Worked Ground (Undivided)	Void

1.2 Superficial Deposits and Landslips Map (1:10,000 scale)



Artificial Ground Legend

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1.2 Superficial Deposits and Landslips

The following geological information represented on the mapping is derived from 1:10,000 scale BGS Geological mapping

1.2.1 Superficial Deposits/ Drift Geology

Are there any records of Superficial Deposits/ Drift Geology within 500m of the study site boundary at 1:10,000 scale? Yes

ID	Distance (m)	Direction	LEX Code	Description	Rock Description
1	45.0	S	HEAD-XVSZC	Head - Gravel, Sand, Silt And Clay	Gravel, Sand, Silt And Clay
2	129.0	NE	BPGR-XSV	Black Park Gravel Member - Sand And Gravel	Sand And Gravel
3	307.0	NE	HEAD-XVSZC	Head - Gravel, Sand, Silt And Clay	Gravel, Sand, Silt And Clay
4	332.0	SW	WIHG-XSV	Winter Hill Gravel - Sand And Gravel	Sand And Gravel
5	367.0	W	HEAD-XVSZC	Head - Gravel, Sand, Silt And Clay	Gravel, Sand, Silt And Clay
6	400.0	S	HEAD-XVSZC	Head - Gravel, Sand, Silt And Clay	Gravel, Sand, Silt And Clay
7	400.0	S	WIHG-XSV	Winter Hill Gravel - Sand And Gravel	Sand And Gravel

1.2.2 Landslip

Are there any records of Landslip within 500m of the study site boundary at 1:10,000 scale?

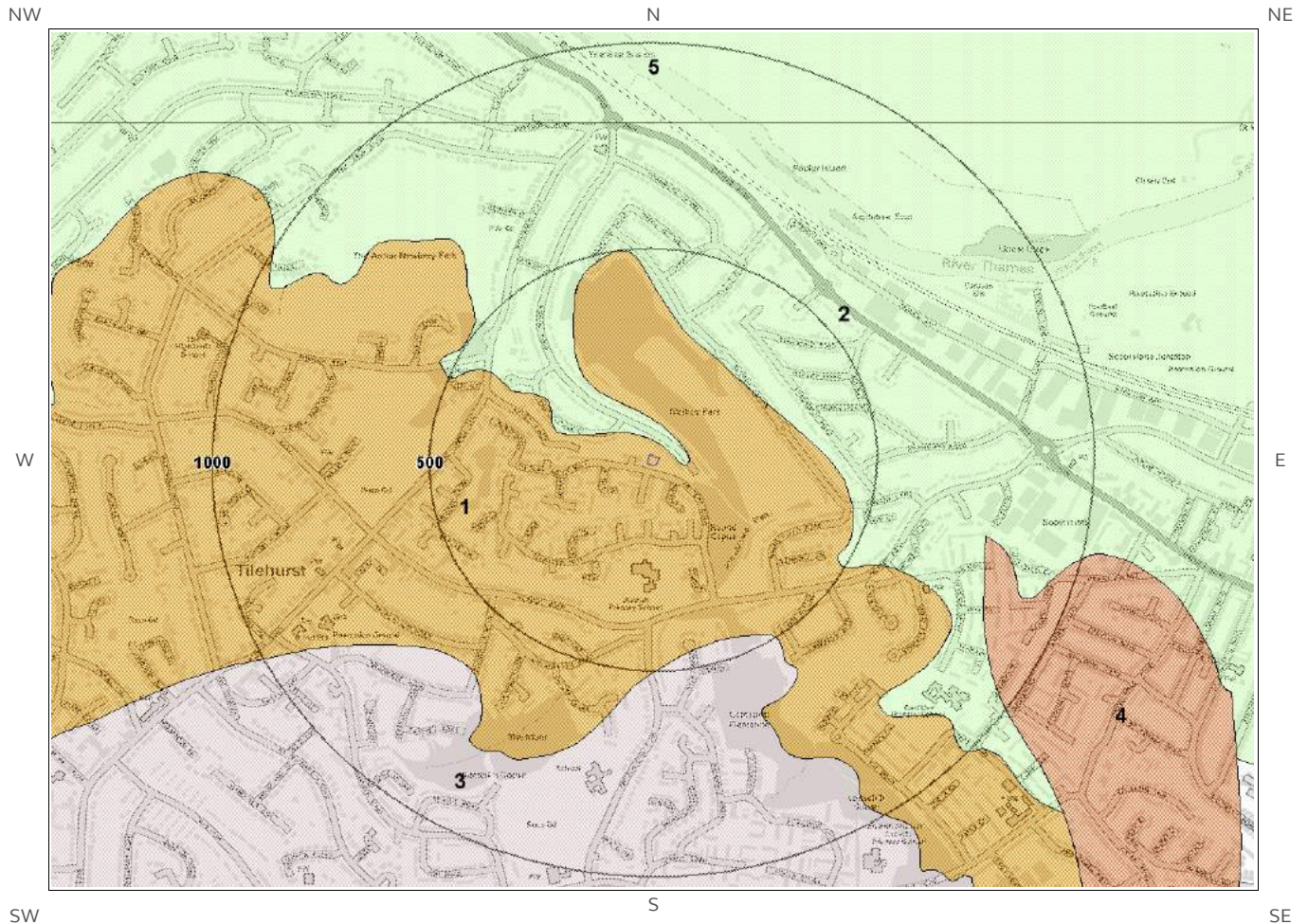
No

Database searched and no data found.

The geology map for the site and surrounding area are extracted from the BGS Digital Geological Map of Great Britain at 1:10,000 scale

This Geology shows the main components as discrete layers, these are: Artificial / Made Ground, Superficial / Drift Geology and Landslips. These are all displayed with the BGS Lexicon code for the rock unit and BGS sheet number. Not all of the main geological components have nationwide coverage.

1.3 Bedrock and Faults Map (1:10,000 scale)

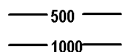


Bedrock and Faults Legend

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Site Outline



Search Buffers (m)

1.3 Bedrock and Faults

The following geological information represented on the mapping is derived from 1:10,000 scale BGS Geological mapping.

1.3.1 Bedrock/ Solid Geology

Records of Bedrock/Solid Geology within 500m of the study site boundary at 1:10,000 scale.

ID	Distance (m)	Direction	LEX Code	Description	Rock Age
1	0.0	On Site	LMBE-CLSISA	Lambeth Group - Clay, Silt And Sand	Paleocene Epoch
2	26.0	NE	LSNCK-CHLK	Lewes Nodular Chalk Formation, Seaford Chalk Formation And Newhaven Chalk Formation (undifferentiated) - Chalk	Campanian Age - Turonian Age
3	448.0	S	LC-CLSISA	London Clay Formation - Clay, Silt And Sand	Eocene Epoch

1.3.2 Faults

Are there any records of Faults within 500m of the study site boundary at 1:10,000 scale? No

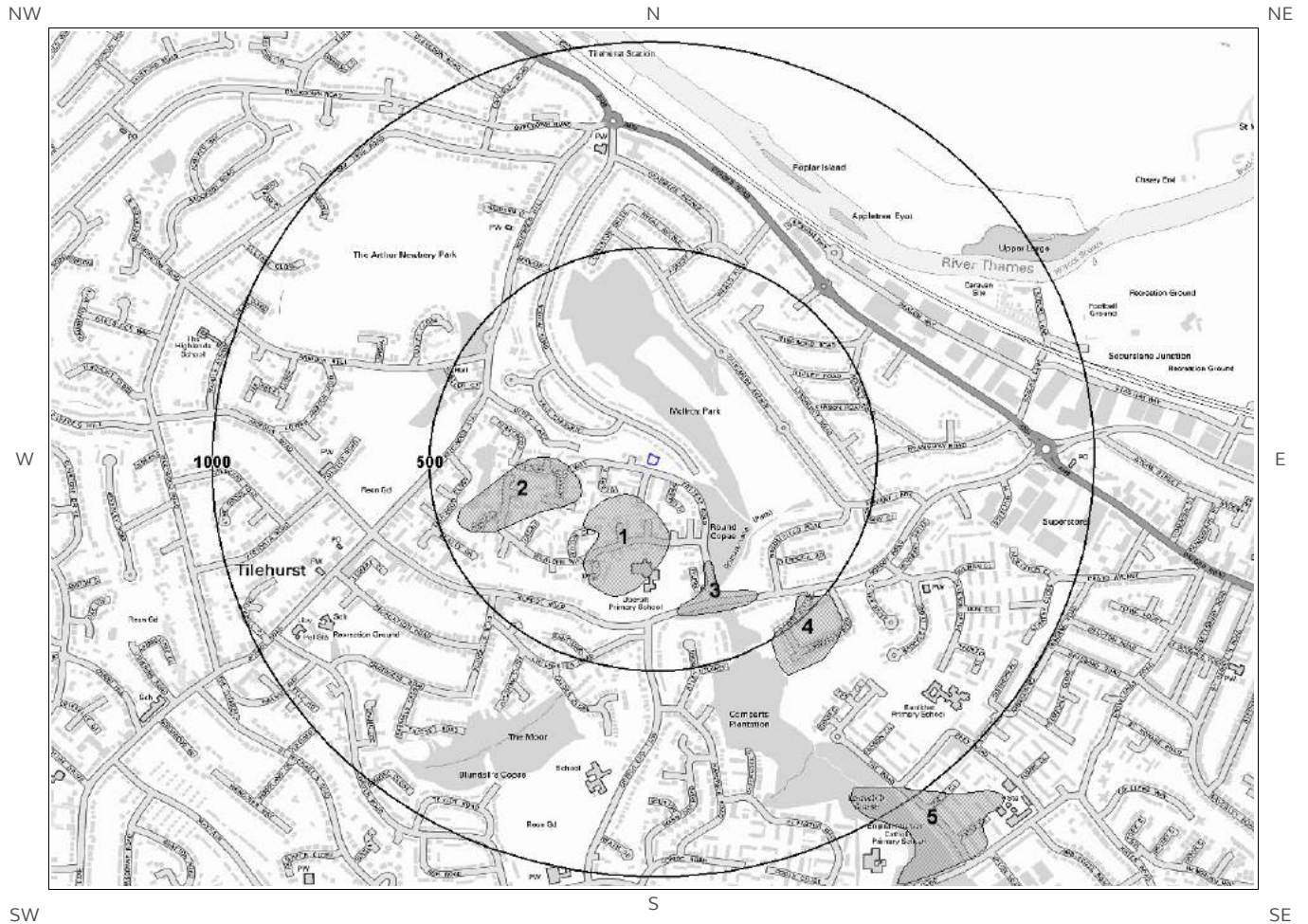
Database searched and no data found at this scale.

The geology map for the site and surrounding area are extracted from the BGS Digital Geological Map of great Britain at 1:10,000 scale.

This Geology shows the main components as discrete layers, these are: Bedrock/ Solid Geology and linear features such as Faults. These are all displayed with the BGS Lexicon code for the rock unit and BGS sheet number. Not all of the main geological components have nationwide coverage.

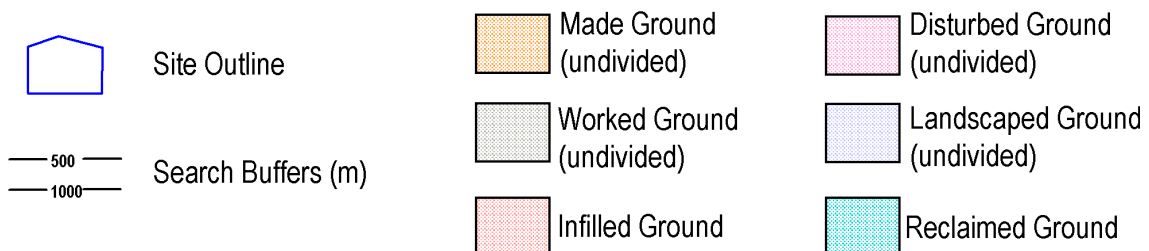
2 Geology 1:50,000 Scale

2.1 Artificial Ground Map



Ground Workings Legend

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2. Geology 1:50,000 scale

2.1 Artificial Ground

The following geological information represented on the mapping is derived from 1:50,000 scale BGS Geological mapping, Sheet No: 268

2.1.1 Artificial/ Made Ground

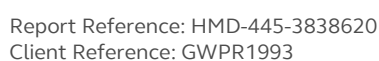
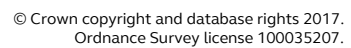
Are there any records of Artificial/ Made Ground within 500m of the study site boundary? Yes

ID	Distance (m)	Direction	LEX Code	Description	Rock Description
1	83.0	SW	WGR-VOID	WORKED GROUND (UNDIVIDED)	VOID
2	160.0	W	WGR-VOID	WORKED GROUND (UNDIVIDED)	VOID
3	262.0	SE	WGR-VOID	WORKED GROUND (UNDIVIDED)	VOID
4	456.0	SE	WGR-VOID	WORKED GROUND (UNDIVIDED)	VOID

2.1.2 Permeability of Artificial Ground

Are there any records relating to permeability of artificial ground within the study site boundary? No

Database searched and no data found.



2.2 Superficial Deposits and Landslips

2.2.1 Superficial Deposits/ Drift Geology

Are there any records of Superficial Deposits/ Drift Geology within 500m of the study site boundary? Yes

ID	Distance	Direction	LEX Code	Description	Rock Description
1	46.0	S	HEAD-XVSZC	HEAD	GRAVEL, SAND, SILT AND CLAY
2	128.0	NE	BPGR-XSV	BLACK PARK GRAVEL MEMBER	SAND AND GRAVEL
3	303.0	NE	HEAD-XVSZC	HEAD	GRAVEL, SAND, SILT AND CLAY
4	334.0	SW	WIHG-XSV	WINTER HILL GRAVEL	SAND AND GRAVEL
5	367.0	W	HEAD-XVSZC	HEAD	GRAVEL, SAND, SILT AND CLAY
6	400.0	S	HEAD-XVSZC	HEAD	GRAVEL, SAND, SILT AND CLAY
7	402.0	S	WIHG-XSV	WINTER HILL GRAVEL	SAND AND GRAVEL

2.2.2 Permeability of Superficial Ground

Are there any records relating to permeability of superficial ground within the study site boundary? Yes

Distance (m)	Direction	Flow Type	Maximum Permeability	Minimum Permeability
46.0	S	Intergranular	Very High	Low

2.2.3 Landslip

Are there any records of Landslip within 500m of the study site boundary? No

Database searched and no data found.

The geology map for the site and surrounding area are extracted from the BGS Digital Geological Map of Great Britain at 1:50,000 scale.

This Geology shows the main components as discrete layers, there are: Artificial/ Made Ground, Superficial/ Drift Geology and Landslips. These are all displayed with the BGS Lexicon code for the rock unit and BGS sheet number. Not all of the main geological components have nationwide coverage.

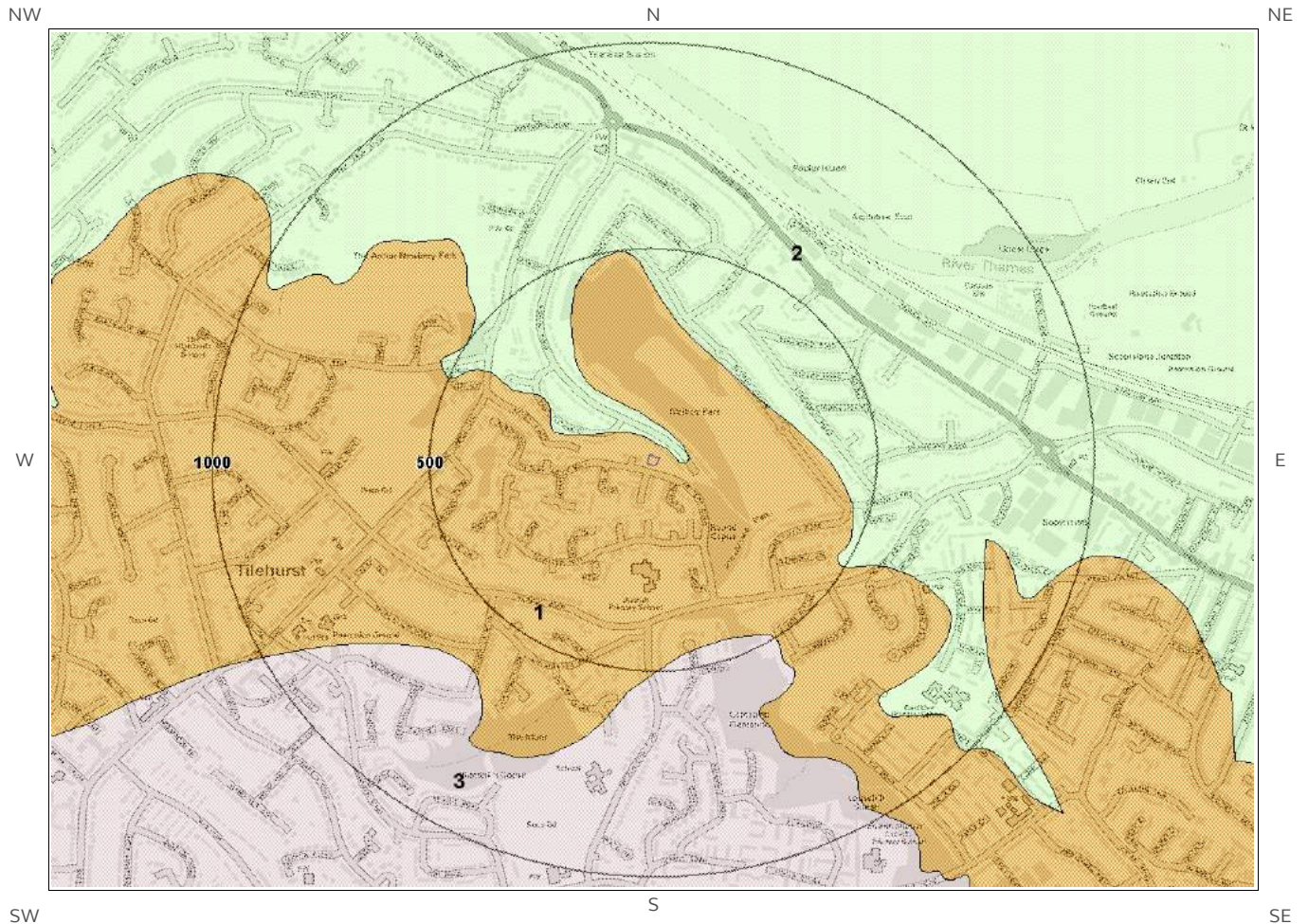
2.2.4 Landslip Permeability

Are there any records relating to permeability of landslips within the study site boundary?

No

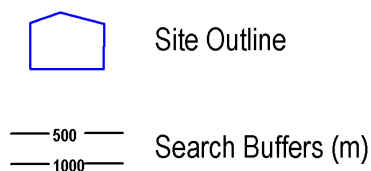
Database searched and no data found.

2.3 Bedrock and Faults Map (1:50,000 scale)



Ground Workings Legend

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2.3 Bedrock, Solid Geology & Faults

The following geological information represented on the mapping is derived from 1:50,000 scale BGS Geological mapping, Sheet No: 268

2.3.1 Bedrock/Solid Geology

Records of Bedrock/Solid Geology within 500m of the study site boundary:

ID	Distance	Direction	LEX Code	Rock Description	Rock Age
1	0.0	On Site	LMBE-XCZS	LAMBETH GROUP - CLAY, SILT AND SAND	THANETIAN
2	28.0	NE	SNCK-CHLK	SEAFORD CHALK FORMATION AND NEWHAVEN CHALK FORMATION (UNDIFFERENTIATED) - CHALK	CONIACIAN
3	451.0	S	LC-XCZS	LONDON CLAY FORMATION - CLAY, SILT AND SAND	YPRESIAN

2.3.2 Permeability of Bedrock Ground

Are there any records relating to permeability of bedrock ground within the study site boundary? Yes

Distance	Direction	Flow Type	Maximum Permeability	Minimum Permeability
0.0	On Site	Mixed	Moderate	Very Low
28.0	NE	Fracture	Very High	Very High

2.3.3 Faults

Are there any records of Faults within 500m of the study site boundary? No

Database searched and no data found.

The geology map for the site and surrounding area are extracted from the BGS Digital Geological Map of Great Britain at 1:50,000 scale.

This Geology shows the main components as discrete layers, these are: Bedrock/Solid Geology and linear features such as Faults. These are all displayed with the BGS Lexicon code for the rock unit and BGS sheet number. Not all of the main geological components have nation wide coverage.

3 Radon Data

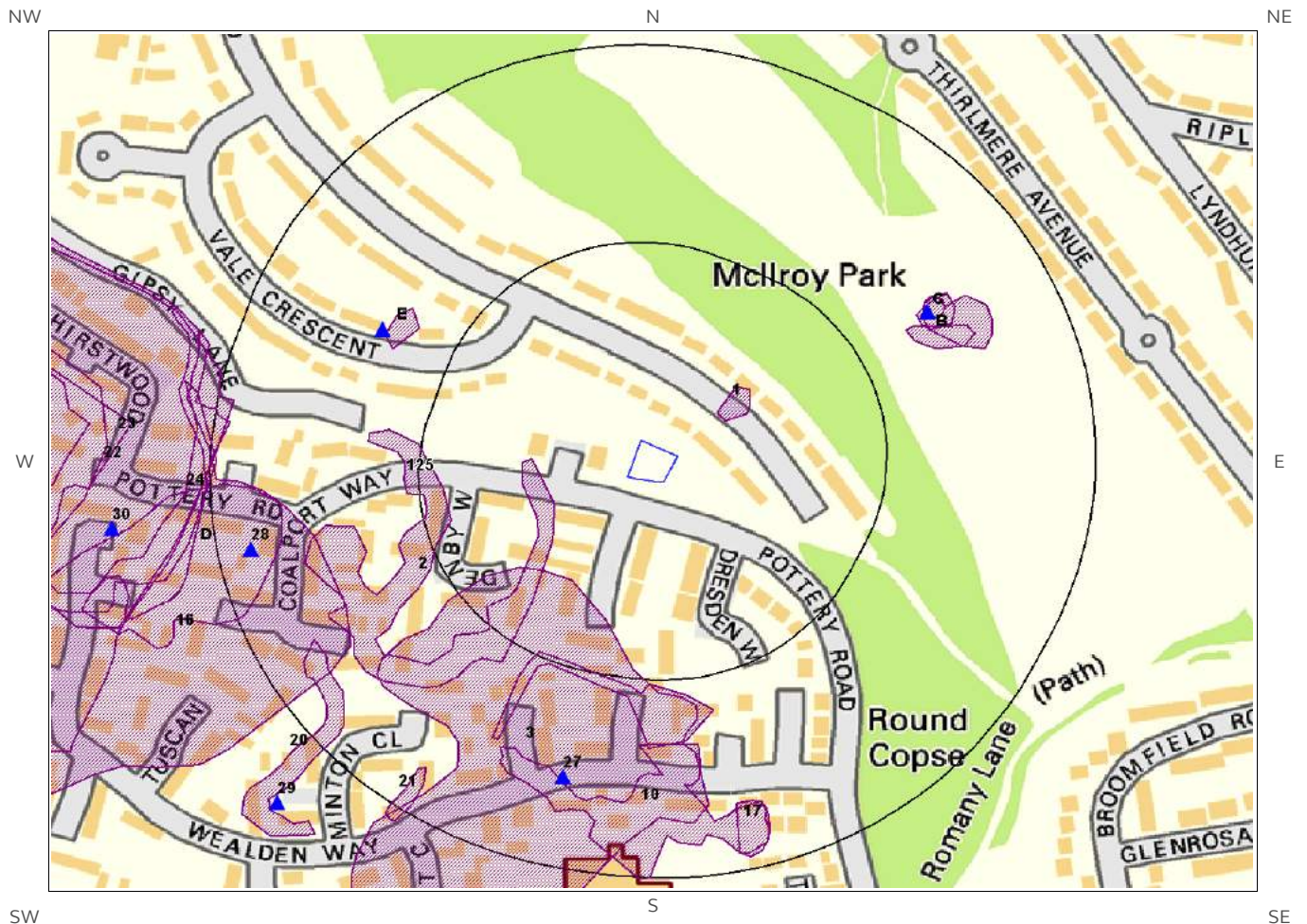
3.1 Radon Affected Areas

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 property is not in a Radon Affected Area, as less than 1% of properties are above the Action Level.

3.2 Radon Protection

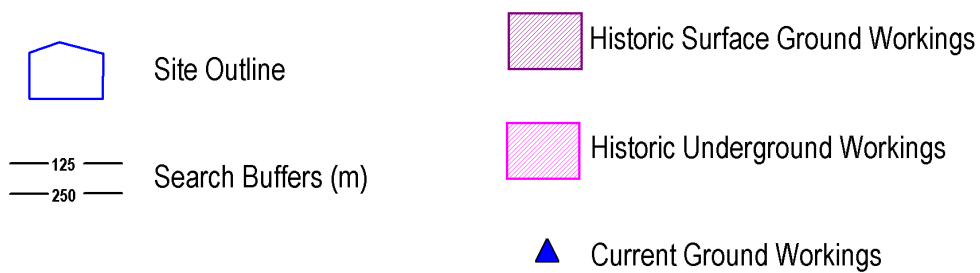
Is the property in an area where Radon Protection are required for new properties or extensions to existing ones as described in publication BR211 by the Building Research Establishment? No radon protective measures are necessary.

4 Ground Workings Map



Ground Workings Legend

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4 Ground Workings

4.1 Historical Surface Ground Working Features derived from Historical Mapping

This dataset is based on Groundsure's unique Historical Land Use Database derived from 1:10,560 and 1:10,000 scale historical mapping

Are there any Historical Surface Ground Working Features within 250m of the study site boundary? Yes

ID	Distance (m)	Direction	NGR	Use	Date
1	36.0	NE	467751 174215	Gravel Pit	1901
2	47.0	W	467569 174117	Unspecified Ground Workings	1901
3	74.0	SW	467630 173987	Clay Pit	1956
4A	122.0	S	467622 174029	Unspecified Ground Workings	1938
5A	122.0	S	467622 174029	Unspecified Ground Workings	1932
6E	150.0	NW	467553 174262	Old Gravel Pit	1897
7B	158.0	NE	467875 174257	Unspecified Pit	1982
8B	158.0	NE	467875 174257	Unspecified Pit	1974
9B	158.0	NE	467875 174257	Unspecified Pit	1991
10	166.0	S	467692 173957	Clay Pit	1938
11C	168.0	NE	467872 174274	Old Chalk Pit	1897
12C	170.0	NE	467885 174267	Sand Pit	1956
13C	173.0	NE	467871 174276	Unspecified Pit	1938
14C	173.0	NE	467871 174276	Unspecified Pit	1932
15C	173.0	NE	467871 174276	Unspecified Pit	1910
16	187.0	SW	467387 174064	Clay Pit	1956
17	208.0	S	467763 173948	Unspecified Pit	1956
18D	208.0	W	467438 174168	Unspecified Ground Workings	1932
19D	208.0	W	467438 174168	Unspecified Ground Workings	1938
20	213.0	SW	467505 174004	Unspecified Ground Workings	1901
21	220.0	SW	467555 173968	Pond	1901

ID	Distance (m)	Direction	NGR	Use	Date
22	240.0	W	467368 174169	Brick Tile and Pottery Works	1910
23	240.0	W	467419 174202	Brick and Tile Kilns	1878
24	247.0	W	467367 174166	Unspecified Ground Workings	1897

4.2 Historical Underground Working Features derived from Historical Mapping

This data is derived from the Groundsure unique Historical Land Use Database. It contains data derived from 1:10,000 and 1:10,560 historical Ordnance Survey Mapping and includes some natural topographical features (Shake Holes for example) as well as manmade features that may have implications for ground stability. Underground and mining features have been identified from surface features such as shafts. The distance that these extend underground is not shown.

Are there any Historical Underground Working Features within 1000m of the study site boundary? No

Database searched and no data found.

4.3 Current Ground Workings

This dataset is derived from the BGS BRITPITS database covering active; inactive mines; quarries; oil wells; gas wells and mineral wharves; and rail deposits throughout the British Isles.

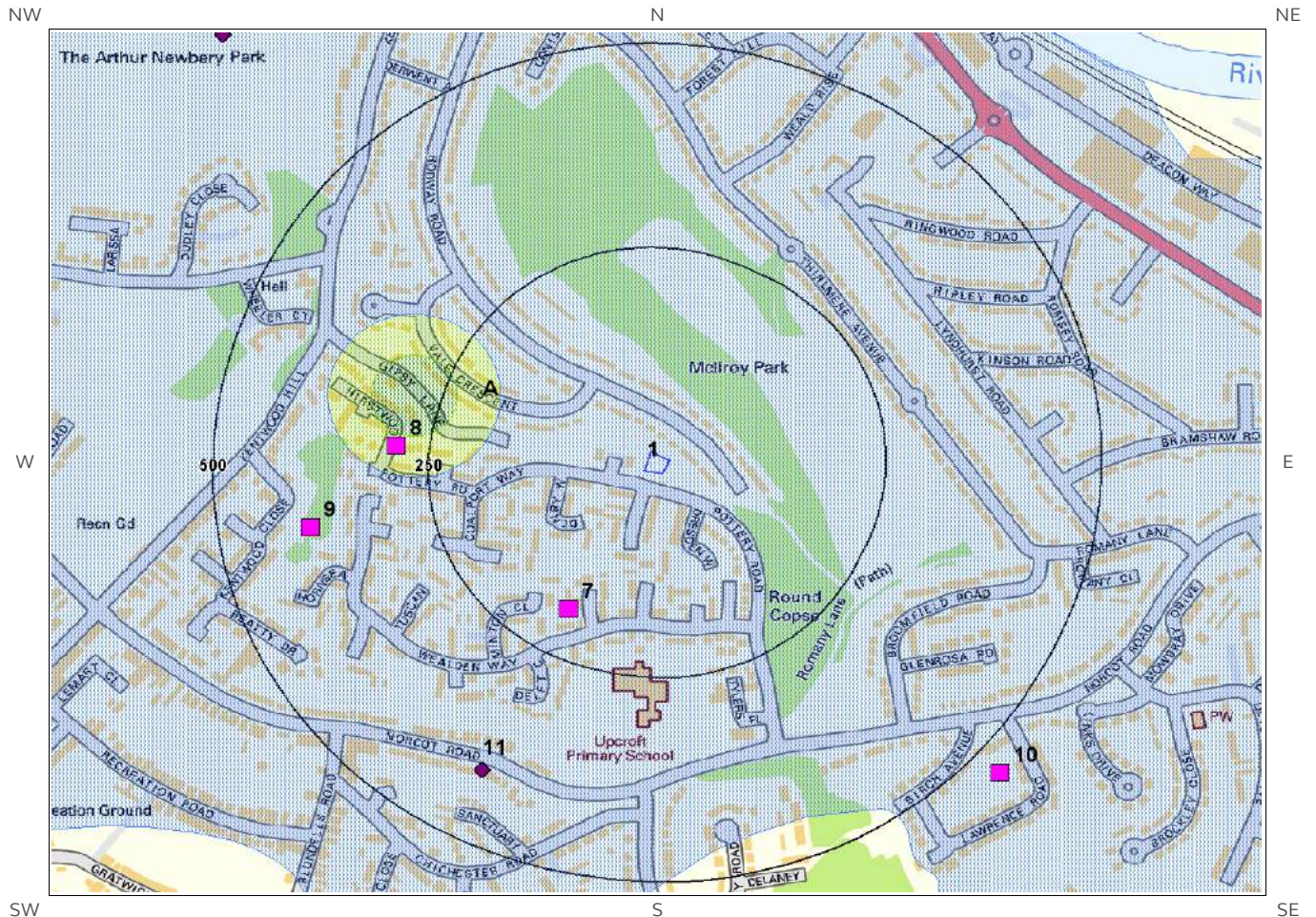
Are there any BGS Current Ground Workings within 1000m of the study site boundary? Yes

The following Current Ground Workings information is provided by British Geological Survey:

ID	Distance (m)	Direction	NGR	Commodity Produced	Pit Name	Type of working	Status
25E	170.0	NW	467541 174262	Chalk	Gipsy Lane Gravel Pit	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
26C	175.0	NE	467867 174273	Sand & Gravel	Beecham Hill Chalk Pit	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
27	194.0	S	467649 173979	Clay & Shale	Hill Top Quarry	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
28	230.0	W	467462 174123	Clay & Shale	Kew Kiln	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
29	294.0	SW	467478 173963	Clay & Shale	Tilehurst	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
30	310.0	W	467379 174136	Clay & Shale	Kew Kiln	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
Not shown	414.0	SW	467311 173997	Clay & Shale	Kew Kiln	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased

ID	Distance (m)	Direction	NGR	Commodity Produced	Pit Name	Type of working	Status
Not shown	448.0	SE	467934 173778	Clay & Shale	Norcot Kilns	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
Not shown	458.0	N	467626 174645	Chalk	Kentwood Farm Chalk Pit	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
Not shown	472.0	NW	467318 174475	Chalk	Armour Chalk Pit	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
Not shown	516.0	E	468199 173995	Sand & Gravel	Norcot Farm Gravel Pit	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
Not shown	538.0	SE	467965 173692	Clay & Shale	Norcot Kilns	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
Not shown	592.0	NW	467276 174610	Sand & Gravel	Armour Gravel Pits	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
Not shown	708.0	NW	467171 174667	Sand & Gravel	Armour Gravel Pits	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
Not shown	713.0	NW	467119 174611	Sand & Gravel	Armour Gravel Pits	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
Not shown	768.0	NW	467116 174696	Sand & Gravel	Armour Gravel Pits	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
Not shown	776.0	SW	467262 173520	Sand & Gravel	Blundell's Copse Gravel Pit	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
Not shown	868.0	SW	467156 173483	Sand & Gravel	Blundell's Copse Gravel Pit	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
Not shown	943.0	NW	466965 174788	Chalk	Lucas's Farm Chalk Pit	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
Not shown	947.0	SE	468524 173682	Sand & Gravel	Penham's Shaw Gravel Pit	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
Not shown	957.0	SE	468596 173802	Sand & Gravel	Penham's Shaw Gravel Pit	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
Not shown	968.0	SE	468508 173618	Sand & Gravel	Penham's Shaw Gravel Pit	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased

5 Mining, Extraction & Natural Cavities Map



Mining, Extraction and Natural Cavities Legend

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5 Mining, Extraction & Natural Cavities

5.1 Historical Mining

This dataset is derived from Groundsure unique Historical Land-use Database that are indicative of mining or extraction activities.

Are there any Historical Mining areas within 1000m of the study site boundary? No

Database searched and no data found.

5.2 Coal Mining

This dataset provides information as to whether the study site lies within a known coal mining affected area as defined by the coal authority.

Are there any Coal Mining areas within 1000m of the study site boundary? No

Database searched and no data found.

5.3 Johnson Poole and Bloomer

This dataset provides information as to whether the study site lies within an area where JPB hold information relating to mining.

Are there any JPB Mining areas within 1000m of the study site boundary? No

The following information provided by JPB is not represented on mapping: Database searched and no data found.

5.4 Non-Coal Mining

This dataset provides information as to whether the study site lies within an area which may have been subject to non-coal historic mining.

Are there any Non-Coal Mining areas within 1000m of the study site boundary? Yes

The following non-coal mining information is provided by the BGS:

ID	Distance (m)	Direction	Name	Commodity	Assessment of likelihood
1	0.0	On Site	Not available	Chalk	Localised small scale underground mining may have occurred. Potential for difficult ground conditions are unlikely or localised and are at a level where they need not be considered
2A	182.0	W	Not available	Chalk	Underground mining is known or considered likely to have occurred within or close to the area. Potential for difficult ground conditions are at a level where they should be considered

ID	Distance (m)	Direction	Name	Commodity	Assessment of likelihood
3A	232.0	W	Not available	Chalk	Underground mining is known to have occurred within or very close to the area. Potential for difficult ground conditions should be investigated. Potential for localised subsidence is at a level where it should be considered
Not shown	808.0	N	Not available	Chalk	Localised small scale underground mining may have occurred. Potential for difficult ground conditions are unlikely or localised and are at a level where they need not be considered
Not shown	835.0	N	Not available	Chalk	Localised small scale underground mining may have occurred. Potential for difficult ground conditions are unlikely or localised and are at a level where they need not be considered
Not shown	996.0	N	Not available	Chalk	Sporadic underground mining of restricted extent may have occurred. Potential for difficult ground conditions are unlikely and localised and are at a level where they need not be considered

5.5 Non-Coal Mining Cavities

This dataset provides information from the Peter Brett Associates (PBA) mining cavities database (compiled for the national study entitled “Review of mining instability in Great Britain, 1990” PBA has also continued adding to this database) on mineral extraction by mining.

Are there any Non-Coal Mining cavities within 1000m of the study site boundary? Yes

The following Non-Coal Mining Cavities information provided by Peter Brett Associates:

ID	Distance (m)	Direction	NGR	Address	Superficial Deposits	Bedrock Deposits	Extracted Mineral
7	190.0	SW	467600 174000	'Grovelands'- Excavations (3), Tilehurst, Berkshire	Worked Ground	Lambeth Group, Upper Chalk Formation	Chalk
8	289.0	W	467400 174200	'Kentwood Kiln', Tilehurst, Berkshire	Worked Ground	Lambeth Group, Upper Chalk Formation	Chalk
9	394.0	W	467300 174100	'Kew Kiln/Tilehurst Potteries', Tilehurst, Berkshire	Worked Ground, Head Gravel Winter Hill Gravel	Lambeth Group, Upper Chalk Formation	Chalk
10	535.0	SE	468100 173800	'Norcot Kiln', Tilehurst, Berkshire	Worked Ground	Lambeth Group, Upper Chalk Formation	Chalk

5.6 Natural Cavities

This dataset provides information based on Peter Brett Associates natural cavities database.

Are there any Natural Cavities within 1000m of the study site boundary? Yes

The following Natural Cavities information provided by Peter Brett Associates:

ID	Distance (m)	Direction	NGR	Superficial Deposits	Bedrock Deposits	Cavity Type and Number
11	414.0	SW	467500 173800	Head Gravels, Winter Hill Gravel	Chalk Group, Lambeth Group	Solution Pipe x 1

ID	Distance (m)	Direction	NGR	Superficial Deposits	Bedrock Deposits	Cavity Type and Number
12	710.0	NW	467200 174700	-	Chalk Group, Lambeth Group	Solution Pipe x 3

5.7 Brine Extraction

This data provides information from the Coal Authority issued on behalf of the Cheshire Brine Subsidence Compensation Board.

Are there any Brine Extraction areas within 1000m of the study site boundary? No

Database searched and no data found.

5.8 Gypsum Extraction

This dataset provides information on Gypsum extraction from British Gypsum records.

Are there any Gypsum Extraction areas within 1000m of the study site boundary? No

Database searched and no data found.

5.9 Tin Mining

This dataset provides information on tin mining areas and is derived from tin mining records. This search is based upon postcode information to a sector level..

Are there any Tin Mining areas within 1000m of the study site boundary? No

Database searched and no data found.

5.10 Clay Mining

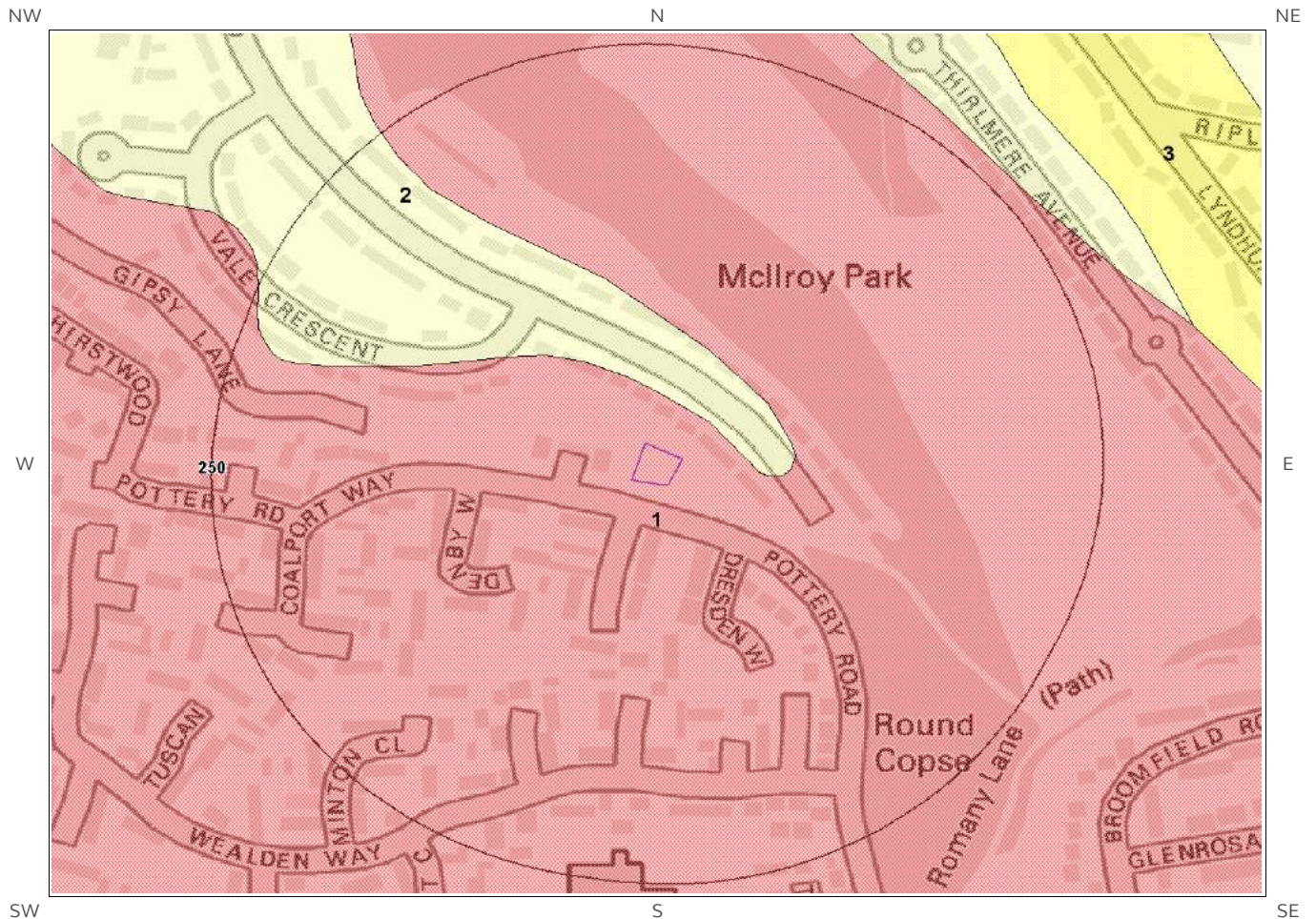
This dataset provides information on Kaolin and Ball Clay mining from relevant mining records.

Are there any Clay Mining areas within 1000m of the study site boundary? No

Database searched and no data found.

6 Natural Ground Subsidence

6.1 Shrink-Swell Clay Map

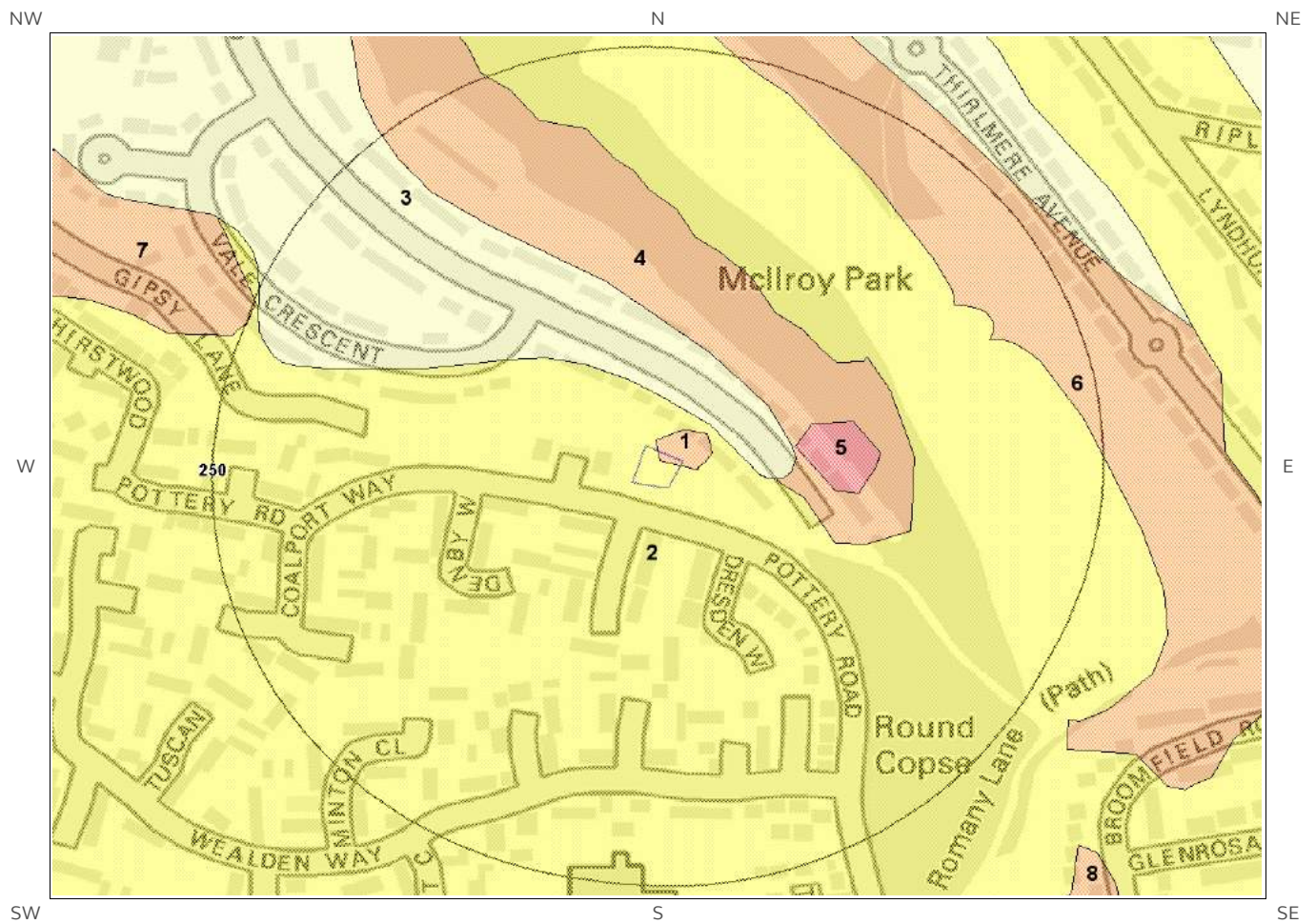


Shrink Swell Clay Legend

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6.2 Landslides Map

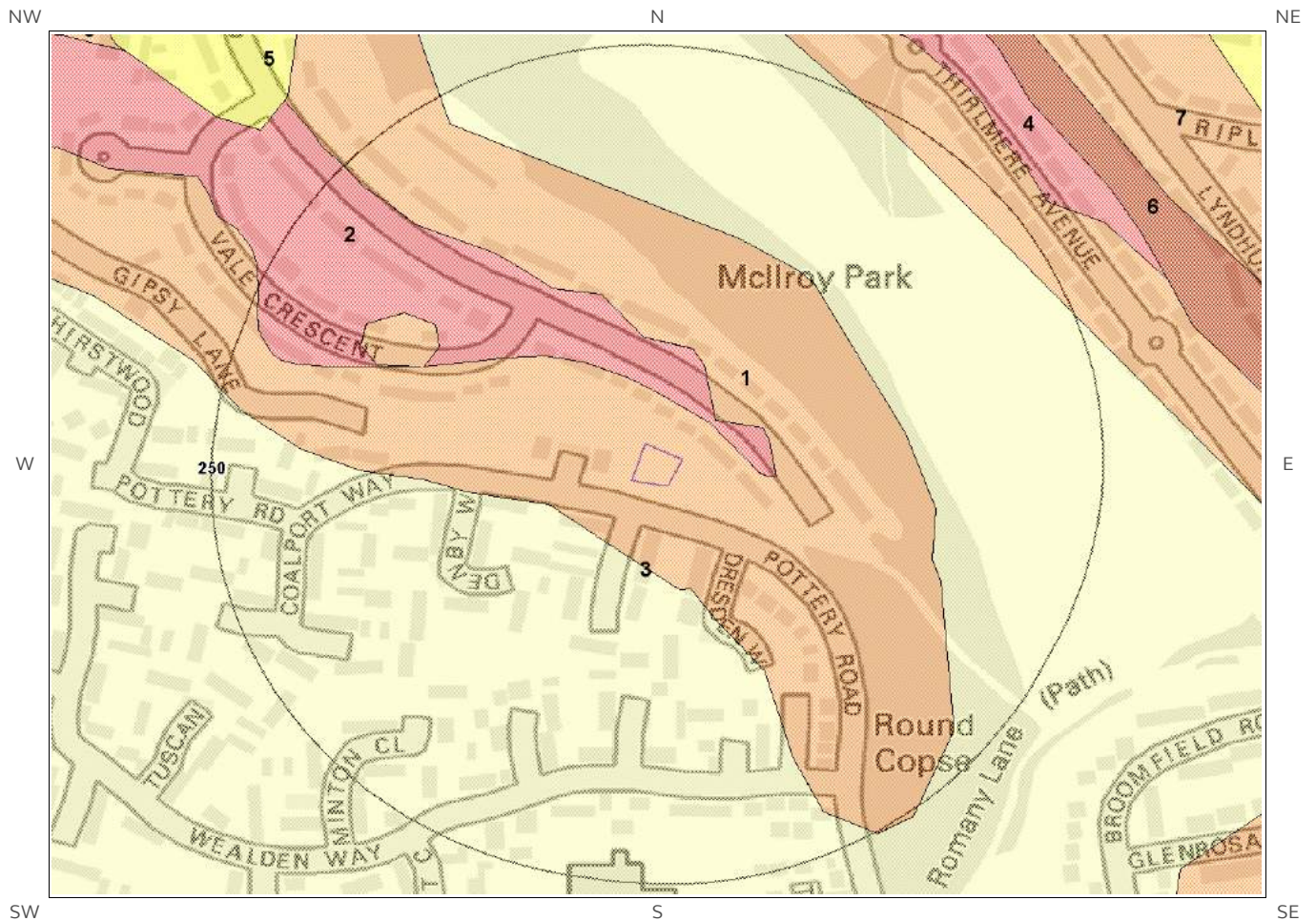


Landslides Legend

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6.3 Ground Dissolution of Soluble Rocks Map

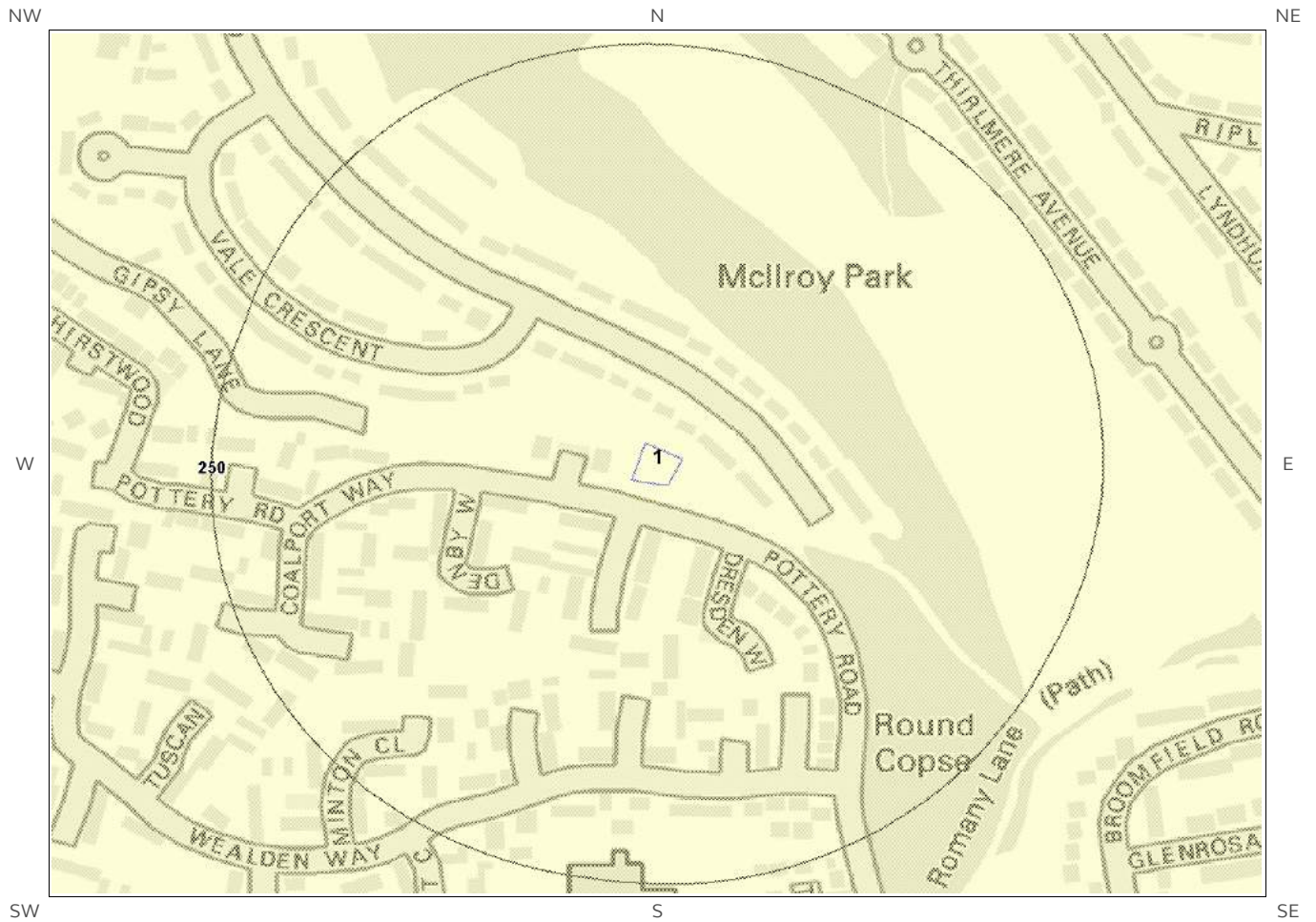


Ground Dissolution
Soluble Rocks Legend

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6.4 Compressible Deposits Map

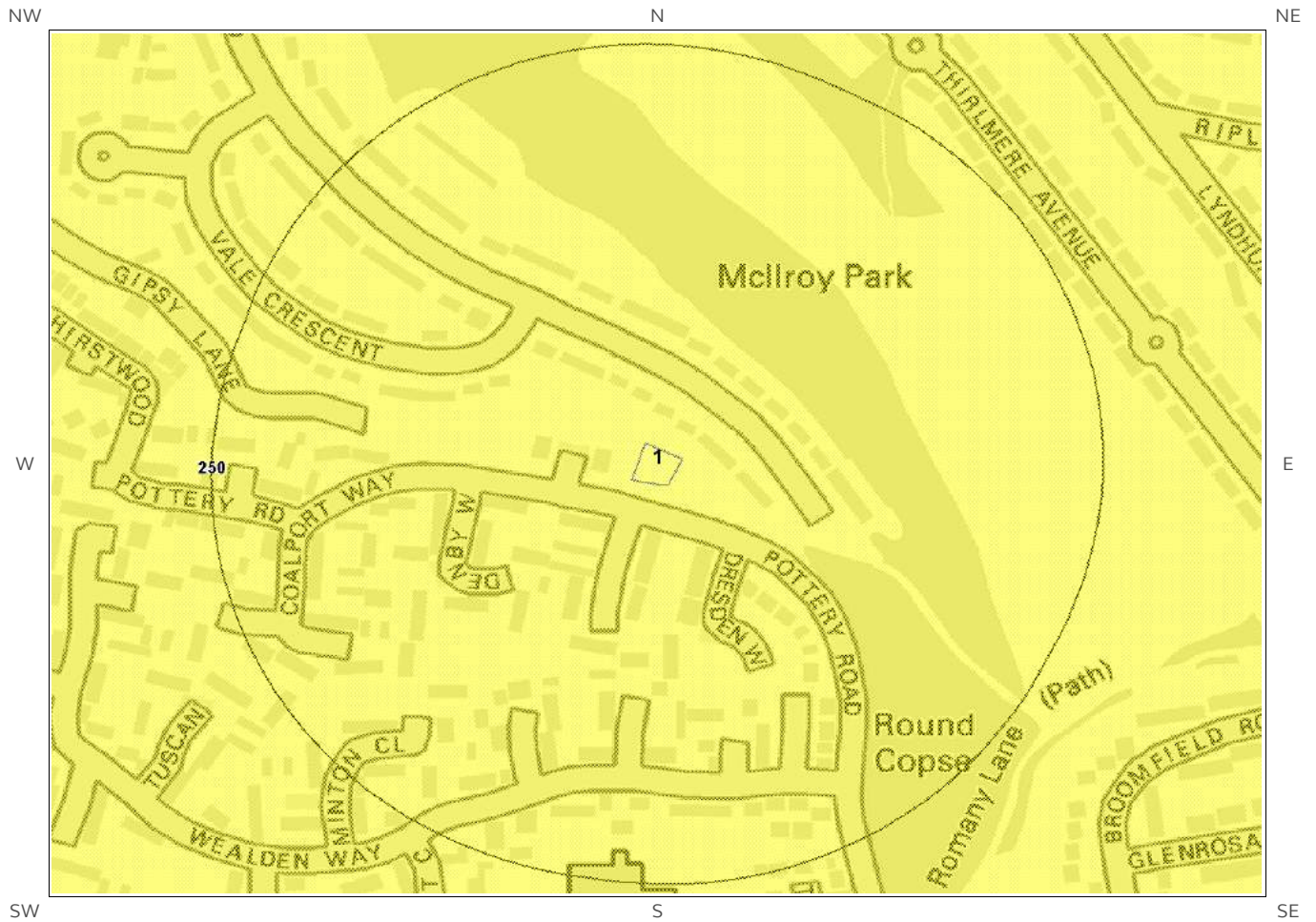


Compressible Deposits Legend

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6.5 Collapsible Deposits Map

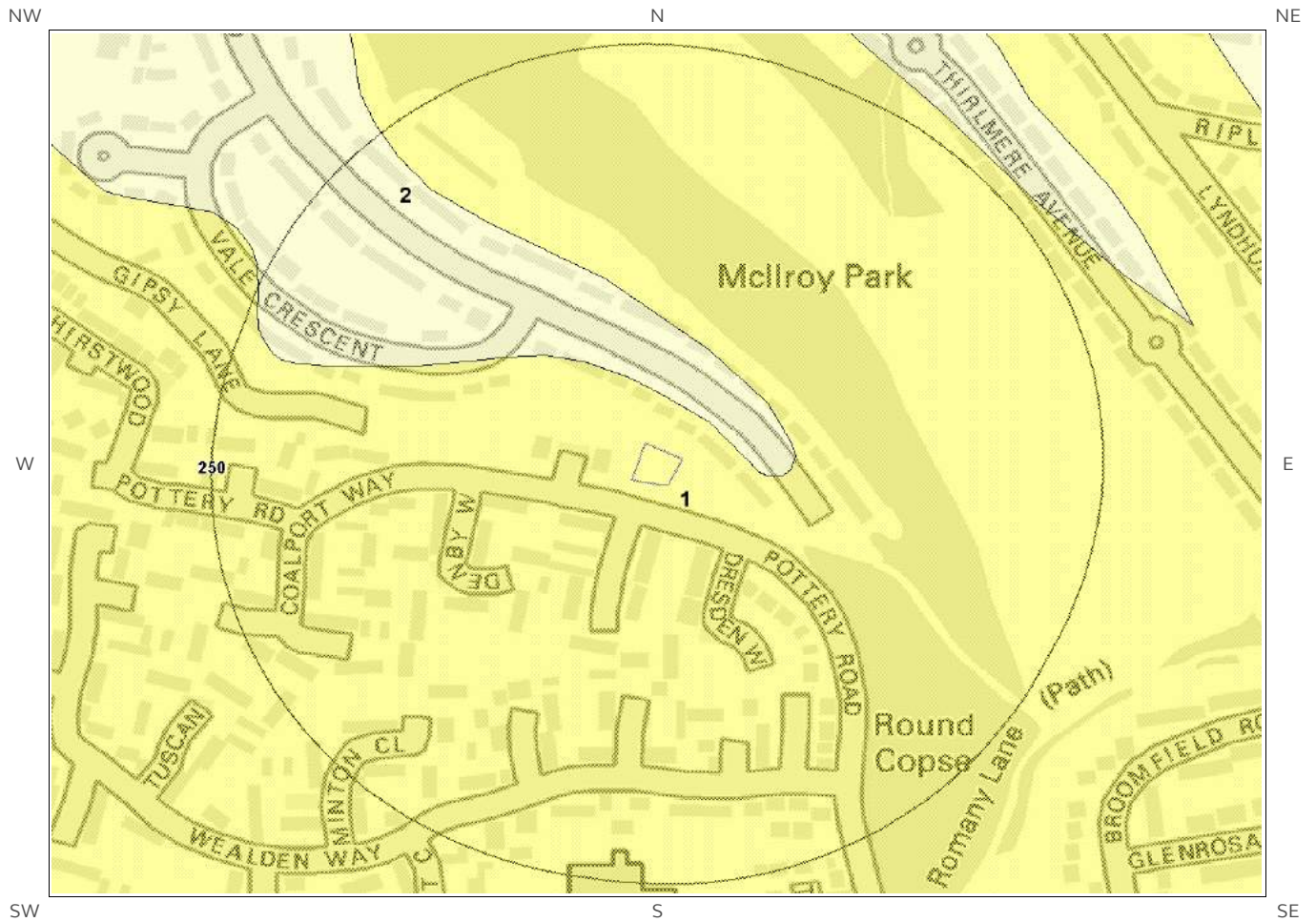


Collapsible Deposits Legend

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6.6 Running Sand Map



Running Sand Legend

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6 Natural Ground Subsidence

The National Ground Subsidence rating is obtained through the 6 natural ground stability hazard datasets, which are supplied by the British Geological Survey (BGS).

The following GeoSure data represented on the mapping is derived from the BGS Digital Geological map of Great Britain at 1:50,000 scale.

What is the maximum hazard rating of natural subsidence within the study site* boundary? Moderate

6.1 Shrink-Swell Clays

The following Shrink Swell information provided by the British Geological Survey:

ID	Distance (m)	Direction	Hazard Rating	Details
1	0.0	On Site	Moderate	Ground conditions predominantly high plasticity. Do not plant or remove trees or shrubs near to buildings without expert advice about their effect and management. For new build, consideration should be given to advice published by the National House Building Council (NHBC) and the Building Research Establishment (BRE). There is a probable increase in construction cost to reduce potential shrink-swell problems. For existing property, there is a probable increase in insurance risk during droughts or where vegetation with high moisture demands is present.
2	28.0	NE	Negligible	Ground conditions predominantly non-plastic. No special actions required to avoid problems due to shrink-swell clays. No special ground investigation required, and increased construction costs or increased financial risk are unlikely likely due to potential problems with shrink-swell clays.

6.2 Landslides

The following Landslides information provided by the British Geological Survey:

ID	Distance (m)	Direction	Hazard Rating	Details
1	0.0	On Site	Low	Possibility of slope instability problems after major changes in ground conditions. Consideration should be given to stability if changes to drainage or excavations take place. Possible increase in construction cost to reduce potential slope stability problems. Existing property - no significant increase in insurance risk due to natural slope instability problems.

* This includes an automatically generated 50m buffer zone around the site

ID	Distance (m)	Direction	Hazard Rating	Details
2	0.0	On Site	Very Low	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.
3	28.0	NE	Negligible	No indicators for slope instability identified. 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.

6.3 Ground Dissolution of Soluble Rocks

The following Ground Dissolution information provided by the British Geological Survey:

ID	Distance (m)	Direction	Hazard Rating	Details
1	0.0	On Site	Low	Significant soluble rocks are present. Low possibility of subsidence occurring naturally, but may be possible in adverse conditions such as high surface or subsurface water flow. Consider implications for stability when changes to drainage or new construction are planned. For new build - site investigation should consider potential for dissolution problems on the site and its surroundings. Care should be taken with local drainage into the bedrock. Some possibility groundwater pollution. For existing property - possible increase in insurance risk due to soluble rocks.
2	28.0	NE	Moderate	Very significant soluble rocks are present, with a moderate possibility of local natural subsidence due to high surface or subsurface water flow. Do not load the land or undertake building work before obtaining specialist advice. Do not dispose of drainage to the ground. Some possibility groundwater pollution. Maintain drainage infrastructure. For new build - specialist site investigation and stability assessment may be necessary before construction. Construction work may cause subsidence. Increased construction costs are likely. For existing property - probable increase in insurance risk due to soluble rocks.
3	41.0	SW	Negligible	Soluble rocks are present, but unlikely to cause problems except under exceptional conditions. No special actions required to avoid problems due to soluble rocks. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with soluble rocks.

6.4 Compressible Deposits

The following Compressible Deposits information provided by the British Geological Survey:

ID	Distance (m)	Direction	Hazard Rating	Details
1	0.0	On Site	Negligible	No indicators for compressible deposits identified. No special actions required to avoid problems due to compressible deposits. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with compressible deposits.

6.5 Collapsible Deposits

The following Collapsible Rocks information provided by the British Geological Survey:

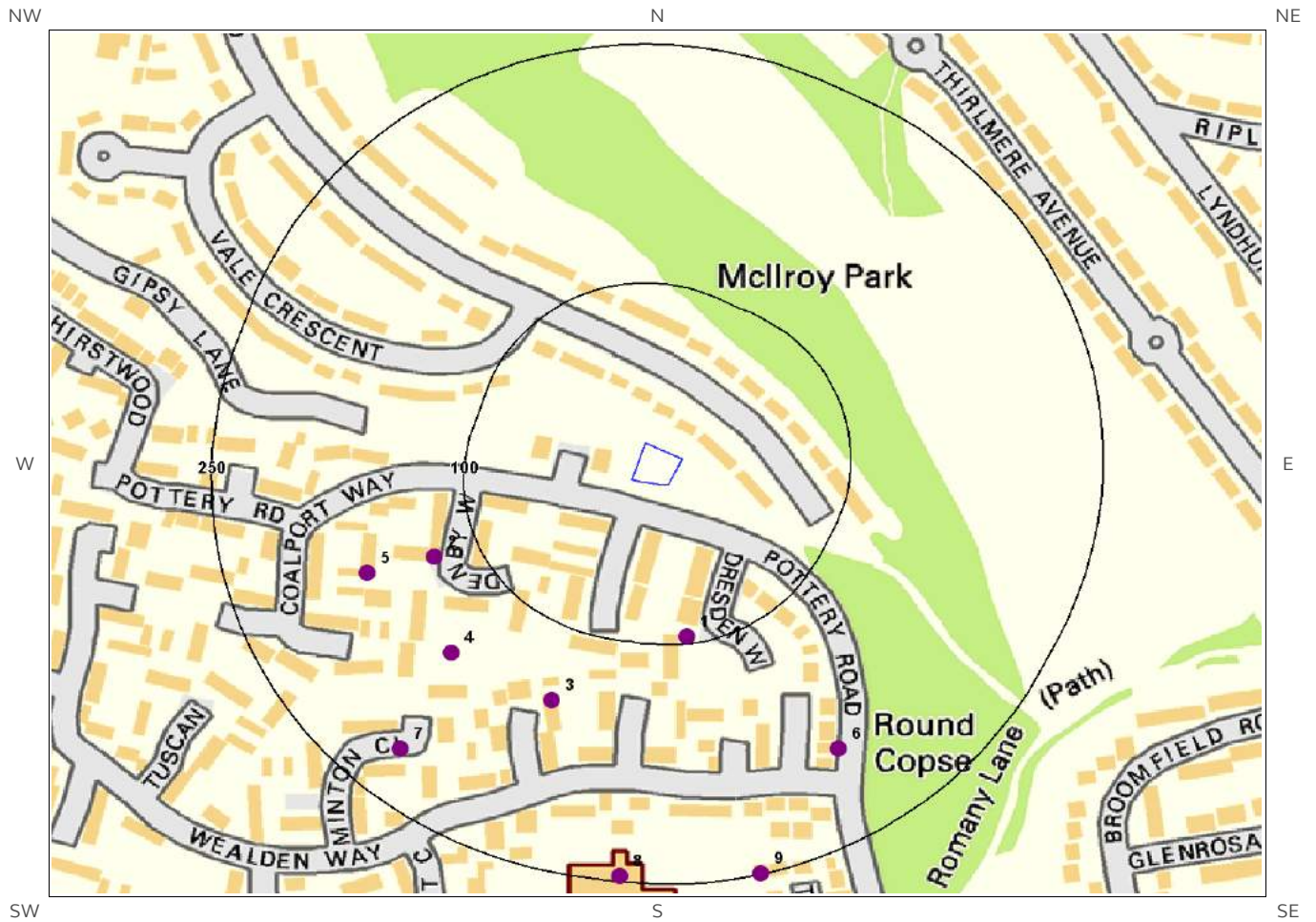
ID	Distance (m)	Direction	Hazard Rating	Details
1	0.0	On Site	Very Low	Deposits with potential to collapse when loaded and saturated are unlikely to be present. No special ground investigation required or increased construction costs or increased financial risk due to potential problems with collapsible deposits.

6.6 Running Sands

The following Running Sands information provided by the British Geological Survey:

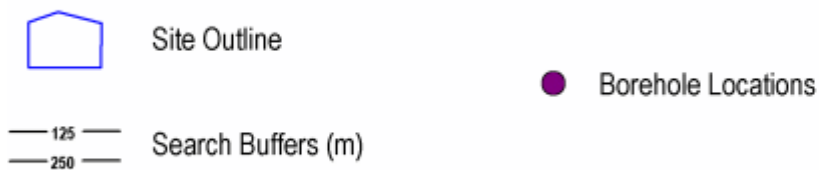
ID	Distance (m)	Direction	Hazard Rating	Details
1	0.0	On Site	Very Low	Very low potential for running sand problems if water table rises or if sandy strata are exposed to water. No special actions required, to avoid problems due to running sand. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with running sand.
2	28.0	NE	Negligible	No indicators for running sand identified. No special actions required to avoid problems due to running sand. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with running sand.

7 Borehole Records Map



Borehole Records Legend

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7 Borehole Records

The systematic analysis of data extracted from the BGS Borehole Records database provides the following information.

Records of boreholes within 250m of the study site boundary:

9

ID	Distance (m)	Direction	NGR	BGS Reference	Drilled Length	Borehole Name
1	96.0	S	467720 174070	SU67SE701	9.14	KENTWOOD HILL TILEHURST 10
2	127.0	W	467570 174120	SU67SE700	7.62	KENTWOOD HILL TILEHURST 9
3	147.0	S	467640 174030	SU67SE698	9.14	KENTWOOD HILL TILEHURST 7
4	153.0	SW	467580 174060	SU67SE707	0.91	KENTWOOD HILL TILEHURST TP3
5	168.0	W	467530 174110	SU67SE703	7.62	KENTWOOD HILL TILEHURST 12
6	194.0	SE	467810 174000	SU67SE699	6.55	KENTWOOD HILL TILEHURST 8
7	218.0	SW	467550 174000	SU67SE706	0.91	KENTWOOD HILL TILEHURST TP2
8	247.0	S	467680 173920	SU67SE695	9.14	KENTWOOD HILL TILEHURST 3
9	249.0	S	467764 173922	SU67SE680	10.0	THE POTTERIES TILEHURST 1

The borehole records are available using the hyperlinks below: Please note that if the donor of the borehole record has requested the information be held as commercial-in-confidence, the additional data will be held separately by the BGS and a formal request must be made for its release.

#1: scans.bgs.ac.uk/sobi_scans/boreholes/15936514
 #2: scans.bgs.ac.uk/sobi_scans/boreholes/15936513
 #3: scans.bgs.ac.uk/sobi_scans/boreholes/15936511
 #4: scans.bgs.ac.uk/sobi_scans/boreholes/15936521
 #5: scans.bgs.ac.uk/sobi_scans/boreholes/15936516
 #6: scans.bgs.ac.uk/sobi_scans/boreholes/15936512
 #7: scans.bgs.ac.uk/sobi_scans/boreholes/15936520
 #8: scans.bgs.ac.uk/sobi_scans/boreholes/15936508
 #9: scans.bgs.ac.uk/sobi_scans/boreholes/15640712

8 Estimated Background Soil Chemistry

Records of background estimated soil chemistry within 250m of the study site boundary:

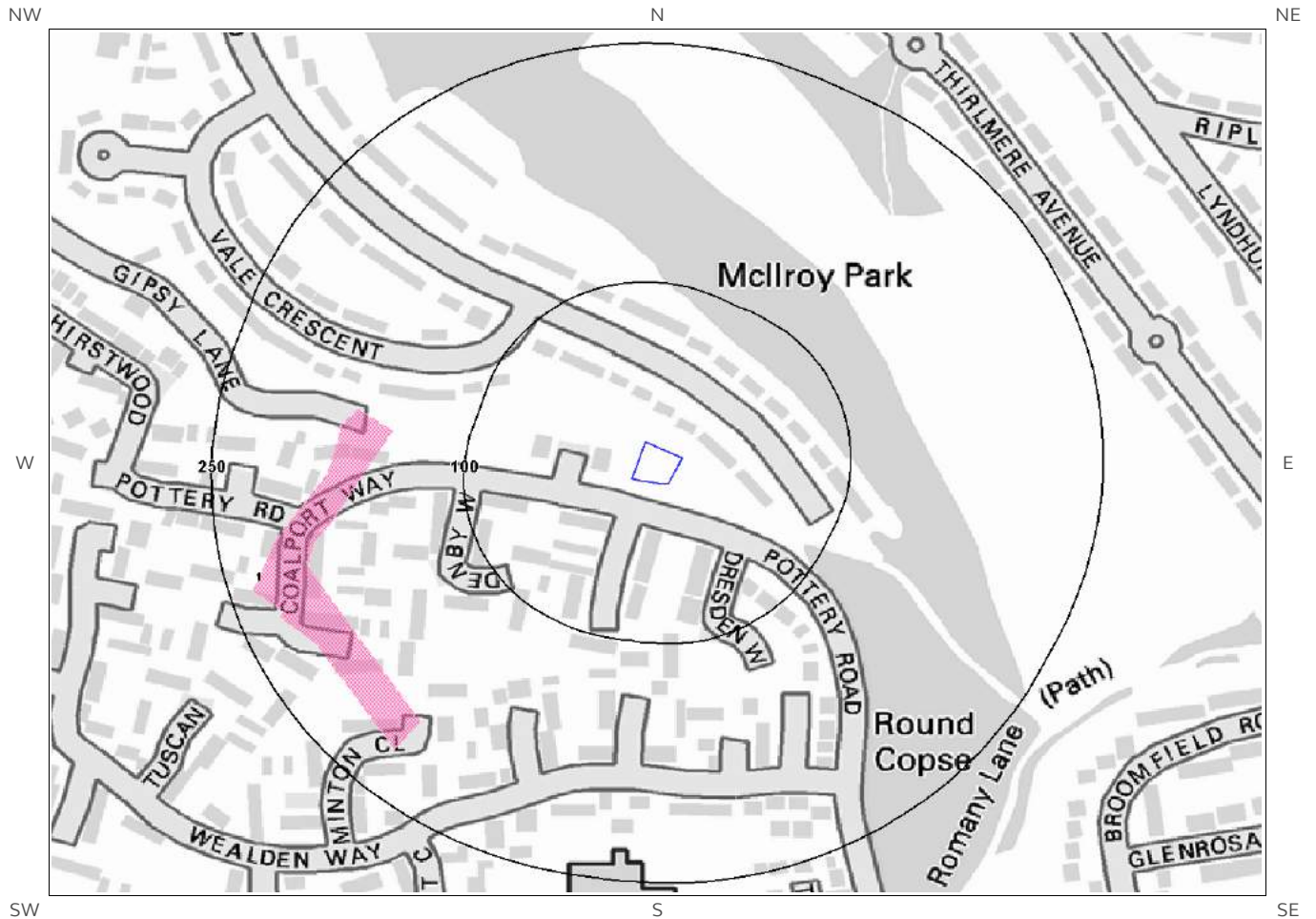
3

For further information on how this data is calculated and limitations upon its use, please see the Groundsure Geo Insight User Guide, available on request.

Distance (m)	Direction	Sample Type	Arsenic (As)	Cadmium (Cd)	Chromium (Cr)	Nickel (Ni)	Lead (Pb)
0.0	On Site	Sediment	<15 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<100 mg/kg
28.0	NE	Sediment	<15 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<100 mg/kg
46.0	S	Sediment	<15 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<100 mg/kg

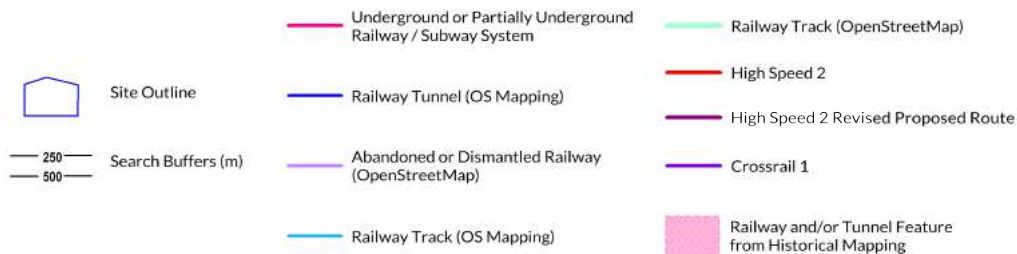
*As this data is based upon underlying 1:50,000 scale geological information, a 50m buffer has been added to the search radius.

9 Railways and Tunnels Map



Railways and Tunnels Legend

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9 Railways and Tunnels

9.1 Tunnels

This data is derived from OpenStreetMap and provides information on the possible locations of underground railway systems in the UK - the London Underground, the Tyne & Wear Metro and the Glasgow Subway.

Have any underground railway lines been identified within the study site boundary? No

Have any underground railway lines been identified within 250m of the study site boundary? No

Database searched and no data found.

Any records that have been identified are represented on the Railways and Tunnels Map.

This data is derived from Ordnance Survey mapping and provides information on the possible locations of railway tunnels forming part of the UK overground railway network.

Have any other railway tunnels been identified within the site boundary? No

Have any other railway tunnels been identified within 250m of the site boundary? No

Database searched and no data found.

Any records that have been identified are represented on the Railways and Tunnels Map.

9.2 Historical Railway and Tunnel Features

This data is derived from Groundsure's unique Historical Land-use Database and contains features relating to tunnels, railway tracks or associated works that have been identified from historical Ordnance Survey mapping.

Have any historical railway or tunnel features been identified within the study site boundary? No

Have any historical railway or tunnel features been identified within 250m of the study site boundary? Yes

ID	Distance (m)	Direction	NGR	Details	Date
1	146	W	467483 174106	Railway Sidings	1901

Any records that have been identified are represented on the Railways and Tunnels Map.

9.3 Historical Railways

This data is derived from OpenStreetMap and provides information on the possible alignments of abandoned or dismantled railway lines in proximity to the study site.

Have any historical railway lines been identified within the study site boundary? No

Have any historical railway lines been identified within 250m of the study site boundary? No

Database searched and no data found.

Multiple sections of the same track may be listed in the detail above
Any records that have been identified are represented on the Railways and Tunnels Map.

9.4 Active Railways

These datasets are derived from Ordnance Survey mapping and OpenStreetMap and provide information on the possible locations of active railway lines in proximity to the study site.

Have any active railway lines been identified within the study site boundary? No

Have any active railway lines been identified within 250m of the study site boundary? No

Database searched and no data found.

Multiple sections of the same track may be listed in the detail above
Any records that have been identified are represented on the Railways and Tunnels Map.

9.5 Railway Projects

These datasets provide information on the location of large scale railway projects High Speed 2 and Crossrail 1 .

Is the study site within 5km of the route of the High Speed 2 rail project? No

Is the study site within 500m of the route of the Crossrail 1 rail project? No

Further information on proximity to these routes, the project construction status and associated works can be obtained through the purchase of a Groundsure HS2 and Crossrail 1 Report.

The route data has been digitised from publicly available maps by Groundsure. The route as provided relates to the Crossrail 1 project only, and does not include any details of the Crossrail 2 project, as final details of the route for Crossrail 2 are still under consultation.

Please note that this assessment takes account of both the original Phase 2b proposed route and the amended route proposed in 2016. As the Phase 2b route is still under consultation, Groundsure are providing information on both options until the final route is formally confirmed. Practitioners should take account of this uncertainty when advising clients.

Contact Details

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