TWEEDIE EVANS CONSULTING

Berkeley Homes (East Thames) Limited

Royal Arsenal Riverside Phases 18 -19

Preliminary Geoenvironmental and Geotechnical Assessment

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Royal Arsenal Riverside Phase 18 -19

Preliminary Geoenvironmental and Geotechnical Assessment

ISSUE RECORD					
Report Reference: 1508005.003.01					
Version	**Date**	**Amendments Record**	**Prepared by**	**Checked by**	**Authorised by**
-	May 2016		[redacted]		

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1 INTRODUCTION

1.1 Terms of Reference

1.1.1 Tweedie Evans Consulting Ltd (TEC) has been appointed by Berkeley Homes (East Thames) Limited to undertake a preliminary geoenvironmental and geotechnical assessment of Royal Arsenal Riverside − Phase 18-19. All works were undertaken in accordance with our proposal letter dated 11 February 2016 and referenced 1508005.003.bidlet.

1.2 Background

1.2.1 The site is situated off Warren Lane and Beresford Lane within the Royal Arsenal River development in Woolwich (Figure 1). The centre of the site is situated at approximate National Grid Reference 543640, 179130 and covers an area of approximately 1.5 hectares. The nearest postcode is SE18 6BJ.

1.2.2 The site currently comprises an irregular shaped parcel of land the southern section of which is currently utilised by sub-contractors for the ongoing works for the Royal Arsenal Riverside development for container storage. The central section of the site is currently utilised by Berkeley Homes as project offices and welfare facilities. Pedestrian access into the site is via a set of gates within this area. A brick building known as the Catholic Club is also present within this area.

1.2.3 The northern section of the site currently comprises an area used for car parking. In addition part of a proposed hotel structure is present along the north-west boundary of the site.

1.2.4 The proposed development is understood to comprise the construction of two structures up to twelve stories in height with associated hard infrastructure and communal soft landscaping.

1.2.5 The aim of these works is to provide information on geoenvironmental and engineering conditions and constraints associated with the site with regard to the proposed development.

1.3 Scope of Works

1.3.1 The scope of work undertaken as part of this report is presented below:

- Preliminary Risk Assessment. This phase of assessment involves development of an initial site conceptual model, based on desk study research and a site reconnaissance survey, in order to establish whether or not there are potentially unacceptable risks.

- Generic Quantitative Risk Assessment. This phase of assessment involves refinement of the site conceptual model developed as part of the Preliminary Risk Assessment based on the findings of an intrusive investigation. Generic assessment criteria and assumptions, if appropriate, are used to evaluate potentially unacceptable risks. Should unacceptable risks be identified, a feasible remediation options appraisal is provided and/or a Detailed Quantitative Risk Assessment is recommended. The purpose of the Detailed Quantitative Risk Assessment is to further refine the conceptual model and use more detailed site specific information and criteria to determine whether there are unacceptable risks.

- Preliminary Geotechnical Assessment. General recommendations regarding likely engineering abnormals are provided on the basis of the findings of an intrusive

investigation, together with preliminary foundation design recommendations for the proposed development.

1.3.2 The above scope of work has been undertaken in accordance with current guidance such as CLR 11 'Model Procedures for the Management of Land Contamination' (Environment Agency, 2004), BS10175+A1 (2013) and, where appropriate NHBC and Eurocode 7.

1.3.3 The report is presented in the following format.

- Preliminary Risk Assessment:
  Section 2 - Site Description
  Section 3 - Site History
  Section 4 - Environmental Setting
  Section 5 - Outline Conceptual Model

- Generic Quantitative Risk Assessment:
  Section 6 - Intrusive Investigation
  Section 7 - Encountered Ground Conditions
  Section 8 - Contamination Characterisation
  Section 9 - Refined Conceptual Model

- Preliminary Geotechnical Assessment:
  Section 10 - Ground Engineering

- Section 11 - Conclusions and Recommendations

2 SITE DESCRIPTION

2.1 Site Location

2.1.1 The site is located within a mixed residential and commercial area and is bounded by the following features (Table 2.1):

Table 2.1: Site Boundary Features

Direction from Site	Description
North	To the north of the site is an area of open soft landscaping.
East / North-east	The land to the east / north-east of the site are currently undergoing construction works associated with phases 3, 6 – 8 of the Royal Arsenal Riverside development.
South / south-west / West	The west, south and south-western boundary of the site is bounded by Beresford Street. Beyond this are a number of residential and commercial units.

2.2 Land Use and Site Condition

2.2.1 A site reconnaissance survey was undertaken on 02 March 2016. A summary of the observations is presented below. Photographs taken during the site reconnaissance survey are presented in Appendix A.

Current Site Use

2.2.2 The site currently comprises an irregular shaped parcel of land. The southern section of the site is currently utilised by sub-contractors for the ongoing works for the Royal Arsenal Riverside development for containerised storage. The central section of the site is currently utilised by Berkeley Homes as project offices and welfare facilities. Pedestrian access into the site is via a set of gates within this area. A brick building known as the Catholic Club is also present within this area.

2.2.3 The northern section of the site currently comprises an area used for car parking. In addition part of a proposed hotel structure is present along the north-west boundary of the site.

Site Topography

2.2.4 The site in general was noted to be relatively flat. Available Ordnance Survey mapping indicates the site is situated at an approximate elevation of 10m Above Ordnance Datum (AOD).

Hard and Soft Landscaping

2.2.5 The site is predominantly laid to hardstanding comprising a combination of existing building footprints, tarmacadam hardstanding, compacted hardcore and areas of gravel.

Fuel Storage

2.2.6 A fuel bowser was observed in the hotel area, within the northern section of the site, during the intrusive works. This is understood to be a temporary storage facility. No fuel spillage was observed onsite associated with this feature.

Hazardous Chemicals and Waste Materials Storage

2.2.7 No evidence of the storage of hazardous chemicals was observed onsite during the site reconnaissance. Notwithstanding this, internal areas of existing buildings and containers were not inspected during the site reconnaissance and therefore, the potential for localised chemical storage cannot be discounted.

2.2.8 Waste materials storage was identified in a number of areas across the site, particularly within the hotel area in the northern section of the site. Waste materials within this area were generally associated with the construction works.

2.2.9 Within the central welfare area of the site, a number of domestic sized waste bins were observed. A large refuse skip was observed within the contractor's village in the southern section of the site, although the contents of these bins was not verified during the site reconnaissance.

2.2.10 Along the southern boundary of the contractor's village, adjacent to Beresford Road, a number of waste materials were observed, presumably derived from the contraction works within proximity to this area. Waste materials included construction materials, plastic piping and vegetation.

Asbestos Containing Materials

2.2.11 No evidence of asbestos containing materials (ACM) was observed onsite during the site reconnaissance. Notwithstanding this, given the potential age of the existing onsite buildings and previous development history, the potential for ACM to be present cannot be discounted.

Site Drainage

2.2.12 Service clearance works undertaken onsite prior to the intrusive works recorded the presence of a number of drains associated with the welfare facilities and offices within the centre of the site. In addition, a number of redundant drains and manholes were recorded within the hotel area car park situated within the northern section of the site.

2.2.13 No areas of standing water were observed across the site during the site reconnaissance or intrusive works.

Evidence of Potential Contamination

2.2.14 No visual or olfactory evidence of gross contamination was encountered onsite during the site reconnaissance.

3 SITE HISTORY

3.1 Introduction

3.1.1 Details of the site history have been obtained through the review of historical Ordnance Survey (OS) mapping. The mapping reviewed is contained within Appendix B.

3.1.2 It is not the purpose of this section to provide a comprehensive account of development history, but only to detail those factors that are or could be relevant to the potentially contaminative history of the site and surrounds and the development of an outline site conceptual model.

3.2 Site History

3.2.1 The following represents a summary of potentially significant features recorded within the site area (Table 3.1).

Table 3.1: Site Features

Site Features	OS Dates
Earliest available mapping (1869) indicates the site contained a number of residential properties, separated into two sections by Rope Yard orientated in a general north-west/south-east direction. Trinity Church is depicted in the south-east corner of the site	1896 – 1940
While Rope Yard is still depicted on mapping, the area to the east of this road is noted to comprise a car park. Holy Trinity Church is noted in the south-east corner of the site as well as a number of other buildings along the boundary with Beresford Street.	1940 – 1958
Rope Yard is noted in the south-eastern section of the site. Buildings, including a garage, are noted in the north/north-western section of the site.	1970 – 1987
Rope Yard and Trinity Church are no longer depicted on mapping. The garage is noted to be present in the north-western section of the site, although many other buildings are no longer depicted.	1991 – 1996

3.3 Neighbouring History

3.3.1 Historic land uses within the immediate vicinity of the site have been considered. Based upon the reviewed map information the following potentially significant features have been identified (Table 3.2).

Table 3.2: Surrounding Features

Surrounding Features	OS Dates	Distance	Direction
Railway	1869 – 2015	~150m	South-west
Gas Works	1869	~150m	North-east
Workshops	1869	~200m	North-west
Tramway	1896 – 1916	Adjacent	South-west
Smithy	1896 – 1916	~100m	North-west

Surrounding Features	OS Dates	Distance	Direction
Timber Yard	1896	~250m	North-east
Coal Wharf	1916	~120m	North-east
Works; later Power Station	1957 – 1970	~150m	North-east
Tank	1957	~200m	West
Depot	1970 – 1996	~90m	West
Electrical Sub-Station	1970 - 1996 1988 – 1991	~75m ~150m	North West
Works	1970 – 1996 1970 – 1996 1970 – 1996 1970 – 1996 1970 – 1996	~10m ~10m ~25m ~25m ~50m	North North North North North
Builder's Yard	1970 1970	Adjacent ~50m	North North
Factory	1970 – 1996	~25m	North
Warehouse	1970 – 1996	~40m	North

3.3.2 Limited information regarding the area to the east of the site is depicted on available mapping. This is likely attributable to the military sensitivity of this area (particularly to the east of the site) in the past.

4 ENVIRONMENTAL SETTING

4.1 Information Sources

4.1.1 Environmental information for the site has been obtained through review of an Envirocheck® report for the site. This report provides extensive information, obtained from regulatory and commercial sources, regarding the environmental setting of the site. The Envirocheck® report has been included within Appendix C.

4.2 Geology and Hydrogeology

4.2.1 Published geological and hydrogeological information indicate the following geological sequence at the site:

Table 4.1: Geological and Hydrogeological Setting

Geological Unit	Thickness	Aquifer Status
Kempton Park Gravels	Unknown	Secondary (Undifferentiated)
Thanet Formation	0-30m	Secondary A Aquifer
White Chalk Subgroup	Variable	Principal Aquifer

Geology

4.2.2 The published geology for the site is shown on British Geological Survey (BGS) Sheet No. 271 (Dartford) Solid and Drift Edition as superficial deposits (Kempton Park Gravels), reportedly comprising essentially sand and gravel with localised lenses of silt, clay or peat and organic material. This is reported to be underlain by bedrock deposits comprising the Thanet Formation, which is described by the BGS as pale yellow-brown, fine grained sand that may be clayey and glauconitic. The White Chalk Subgroup is described by the BGS as chalk with flints and discrete marl seams.

4.2.3 Off site boreholes, associated with the adjacent Phase 3 development area to the north of the site, exhibited the following ground conditions:

Table 4.2: Generalised Ground Profile

Depth (mbgl)	Encountered Material
0 – 1.9	Made Ground: tarmac underlain by gravelly sand. Gravel was reported to include brick, concrete, ash, clinker and metal.
0.9 – 3.1	Kempton Park Gravels: medium dense gravelly fine to medium sand. Gravel reported to comprise fine to medium angular to sub-angular flint.
1.9 – 15.8	Thanet Formation: very dense brown to orangish brown silty fine to medium sand.
15.4 - >20.45	Chalk: recovered as cream/grey in colour with occasional flint.

Ground Gas Generation

4.2.4 In accordance with current guidance (Wilson, Card and Haines (2009) and BS8576: 2013) the ground gas generation potential of the natural strata reported to underlie the site (i.e. Head Deposits and Thanet Formation) may be classified as very low with

a very low level of risk for on site development and a negligible risk of lateral migration. Therefore, the natural ground reported to underlie the site is not considered a potential source of ground gas.

4.2.5 Notwithstanding this, made ground, where present, may provide a potential source of ground gas, subject to thickness and chemical composition.

4.2.6 The site is reported to be located within a lower probability Radon Affected Area as less than 1% of properties are above the Action Level. Therefore, it is reported that no radon protection measures are reported necessary in the construction of new dwelling or extensions.

Hydrogeology

4.2.7 Information provided on the Environment Agency website indicates the underlying superficial deposits have been classified as a Secondary (Undifferentiated) Aquifer, while the underlying bedrock (Thanet Formation and White Chalk Subgroup) have been classified as a Secondary A and Principal Aquifer, respectively. The Environment Agency defines these aquifer types as follows:

> Principal Aquifer: These are layers of rock or drift deposits that have high intergranular and/or fracture permeability - meaning they usually provide a high level of water storage. They may support water supply and/or river base flow on a strategic scale. In most cases, principal aquifers are aquifers previously designated as major aquifer;
>
> Secondary A Aquifer: permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers;
>
> Secondary (Undifferentiated) Aquifer: has been assigned in cases where it has not been possible to attribute either category A or B to a rock type. In most cases, this means that the layer in question has previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type;

4.2.8 The site is reportedly situated within an area considered to have limited potential for groundwater flooding to occur.

4.2.9 There are no reported groundwater abstraction licenses, licensed discharge consents or Source Protection Zones (SPZ) within proximity to the site.

4.2.10 Based upon the above information the geological and hydrogeological setting of the site is considered to be of Low to Moderate Sensitivity.

4.3 Hydrology

4.3.1 The site is situated approximately 250m south of the River Thames, although is not reported to be within an area classified by the Environment Agency as at risk from flooding.

4.3.2 There are no reported discharge consents to surface water within close proximity to the site. Furthermore, there are no reported surface water abstraction licenses or reported pollution incidents to controlled waters within 500m of the site.

4.3.3 Given the above information, the hydrology of the site is considered to be of Low to Moderate Sensitivity.

4.4 Environmental Data

4.4.1 Additional pertinent environmental data from the Envirocheck® report for the site is summarised in Table 4.3.

Table 4.3: Additional Pertinent Environmental Data Summary

Category	0-250m	250-500m	Details
Authorisations, Incidents and Registers			
Local Authority Pollution Prevention and Controls	1	2	~240m West – PG1/14 Petrol Filling Station; ~290m South – PG6/46 Dry Cleaning; and ~365m South – PG6/46 Dry Cleaning
Registered Radioactive Substances	0	3	~275m South – Authorisation for the disposal of radioactive waste – Greenwich University (3No. records).
Waste Management			
Landfills and/or other waste management sites	3	0	Licensed Waste Management Facilities: ~25m South – Household, Commercial and Industrial Transfer Station (Surrendered). Registered Waste Transfer Sites: ~35m south – small transfer station accepting <10,000-25,000tonnes (2No. records).

Category	0-250m	250-500m	Details
Current Land Uses			
Potentially contaminative land uses	39	50	Onsite: Printers (inactive); Precision Engineers (inactive); and Car Body Repairs (inactive). Within 250m (including) ~30m West – Commercial Cleaning Services (inactive); ~55m West – Freight Forwarders (inactive); ~80m South-west – Laundries (inactive); ~95m South – Photographic Processors (inactive); ~125m South-east Dry Cleaners (inactive); and ~135m South-east – Commercial Cleaning Services.
Petrol and fuel sites	1	0	~240m West – Shell Garage (obsolete).
Ecological Designated Areas			
Site of ecological value	1	0	The River Thames Estuary, to the north of the site, is a designated Marine Nature Reserve.

4.5 Engineering Considerations

4.5.1 Engineering considerations identified from the Envirocheck® report for the site are summarised below:

Table 4.4: Engineering Considerations

Hazard	Hazard Potential					
	Rare	No Hazard	Very Low	Low	Moderate	High
Collapsible ground			X			
Compressible ground		X	X			
Ground dissolution		X				
Landslide			X			
Running sand			X			

Hazard	Hazard Potential					
	Rare	No Hazard	Very Low	Low	Moderate	High
Shrink/swell clays			X			
Coal mining	X					
Non-coal mining	X					

4.6 Regulatory Consultations

4.6.1 The following regulatory consultation has been undertaken with respect to possible environmental issues and ground conditions on-site and in the surrounding area.

Community Services – Contaminated Land and Pollution Control – Royal Borough of Greenwich

4.6.2 Contaminated Land and Pollution Control was contacted with regards to any potential contaminated land issues on site and within the surrounding area. The information provided is presented in Appendix D. A summary of the response is provided below.

- It has been reported by Contaminated Land that the Council hold no records relating to pre-licensed landfill sites, Part B APC authorisations, private water supplies, records of unexploded ordnance or potential issues regarding to naturally elevated contaminant concentrations within 500m of the site.

- While it is reported that there are no known pollution incidents or areas of contaminated land within 500m of the site, it is noted that the site is part of the Royal Arsenal Complex, which was military land occupied and used for munitions manufacture and testing along with associated industries. This is reported to have covered a large area of land from Woolwich to Thamesmead and as a result, statutory remediation was necessary in some areas.

- A former garage is understood to have been present within the northern section of the site. A verification report by Subadra (2012) has been provided by Royal Borough of Greenwich Council following the testing of ground materials at the base and sides of excavations following the removal of tanks formerly associated with this feature. 26No. samples were reportedly collected and elevated TPH concentrations were reported within 23No of the samples collected.

- In addition, ground gas monitoring data, gathered by MLM in 2012, has been provided. The monitoring relates to a ground investigation undertaken within the hotel area of the site. While methane concentrations were recorded as <0.1% across the three monitoring visits reportedly undertaken within this area, marginally elevated concentrations of carbon dioxide (max 1.1%v/v) was reported within the monitoring wells. Furthermore, the monitoring of volatile organic compounds (VOCs) as part of these works reportedly recorded VOCs within all monitoring wells across the monitoring visits, although these are noted to be generally low with a peak concentration of 8.5ppm recorded.

Building Control – Royal Borough of Greenwich Council

4.6.3 Building Control was contacted with regards to any potential foundation and ground condition issues on site and within the surrounding area. A summary of the response is provided below:

- The site is part of an old Ministry of Defence plot and as a result, there is little information regarding the area available. Notwithstanding this, it has been reported that the construction to the north (Phase 6) experienced some delays due to the presence of archaeological features including foundations of buildings, cobbled streets and layers of arsenic, which may impact upon the subject site.

4.7 Previous Site Report Summary

4.7.1 Parts of the general Royal Arsenal Riverside development have been extensively investigated in the past. The following reports have been used to obtain pertinent environmental and geotechnical information associated with the proposed development area. Reference should be made to the original documents for full details. It should be noted that it is assumed that the information contained within this report may be relied upon for the current assessment; however, Tweedie Evans Consulting Limited cannot be held responsible for the accuracy or validity of any third party information.

Phase II Geo-Environmental Site Investigation – Royal Arsenal Woolwich Phase III. Prepared for Berkeley Urban Renaissance Ltd by Resource & Environmental Consultants Ltd. Report No. 80114 dated December 2011

Introduction

4.7.2 The Phase 3 site area is situated to the north/north-east of the current Phase 18-19 site area. REM undertook intrusive works comprising 2No. cable percussive boreholes to a maximum depth of 20.45mbgl and 6No. window sample boreholes to a maximum depth of 4.45mbgl to aid in the development of this area.

Reported Ground Conditions

4.7.3 Made ground was reported across the site to a maximum observed depth of 1.9mbgl and was generally reported to comprise tarmacadam hardstanding underlain by gravelly sand. The gravel component was reported to include brick, concrete, clinker, ash and metal.

4.7.4 This in turn was reported to be underlain by superficial deposits of gravel at depths of between 0.9mbgl and 3.1mbgl. This material was reported to comprise medium dense gravelly fine to medium sand with fine to medium gravel of angular to sub-angular flint.

4.7.5 The Thanet Formation, was reported to comprise very dense brown to orangish brown silty dense fine to medium sand from encountered depths of between 1.9mbgl and 15.8mbgl with a thin (approximately 0.2m) band of Bull Head Deposits recorded as grey slightly gravelly fine to medium sand reported directly beneath the Thanet Formation.

4.7.6 Chalk was reportedly encountered on site in two locations at a depth of 16.0mbgl. While REC have described this material as Structureless (Dm) Grade chalk, the available SPT for these logs report SPT 'N' values of between 24 and 37, suggesting the material to be of a more competent nature than logged.

Groundwater

4.7.7 Groundwater strikes were reportedly encountered within the two cable percussive boreholes at depths of 10.0mbgl and 11.0mbgl. Subsequent monitoring of these boreholes reported the groundwater levels to rise to depths of between 6.3mbgl and 7.91mbgl.

Contamination

4.7.8 A number of exceedances of the screening criteria used by REC were reported for several determinants within the made ground when considering a residential site end use. These included the following:

- Arsenic (Max. 47mg/kg);
- Lead (Max. 2100mg/kg);
- Mercury (Max. 22mg/kg);
- Nickel (Max. 210mg/kg);
- Copper (Max. 24000mg/kg);
- Zinc (Max. 3800mg/kg);
- Benzo(a)anthracene (Max. 14mg/kg);
- Benzo(b/k)fluoranthene (Max. 19mg/kg);
- Benzo(a)pyrene (Max. 12mg/kg);
- Benzo(ghi)perylene (Max. 6.3mg/kg); and
- TPH C21-35 Aromatic (Max. 1500mg.kg).

4.7.9 In addition, based on TEC's review of the results, PCB concentrations above the limit of detection were also recorded.

Ground Gas

4.7.10 An addendum report produced in conjunction with the Geo-Environmental Report (Ref 80114) reported a low risk from ground gas due to the absence of landfills in proximity and made ground considered to have low generation rates.

Validation Sampling Report – Teardrop Site, Woolwich. Prepared for Wooldridge Ecotec Ltd by Subadra. Report No. IN07659CL011 dated December 2007

4.7.11 Subadra reportedly undertook sampling of soil recovered for the sides and bases of excavations associated with tanks from the former garage, understood to be located within the northern/north-western section of the site.

4.7.12 26No. samples were reportedly collected and scheduled for banded Total Petroleum Hydrocarbons (TPH) at a UKAS accredited laboratory.

4.7.13 Of the 26No samples scheduled, elevated TPH concentrations were recorded within 23No samples. A summary of which is presented below:

TPH	Maximum recorded concentration (mg/kg)	Minimum recorded concentration (mg/kg)	Current SSV for a residential site end use	No of Exceedances
C8 – C10	816	<1	27	3
>C10 – C12	177	<1	130	1
>C12 – C16	201	<1	1100	0

TPH	Maximum recorded concentration (mg/kg)	Minimum recorded concentration (mg/kg)	Current SSV for a residential site end use	No of Exceedances
>C16 – C21	154	<1	65000	0
>C21 – C35	118	<1	65000	0

4.7.14 It is noted that when comparing the reported concentrations with the current SSVs for a residential site end use without homegrown produce, a number of exceedances are reported for the lower banded TPH concentrations i.e. C8 – C12.

4.8 General Summary

4.8.1 Given the above Environmental Setting and the general land use for the area, discussed in Section 2, this site is considered to be of Low to Moderate Overall Environment Sensitivity.

5 OUTLINE CONCEPTUAL MODEL

5.1 Introduction

5.1.1 The assessment of potential risk associated with any identified contamination is based upon the identification and evaluation of Significant Pollutant Linkages.

5.1.2 A Significant Pollutant Linkage exists on a site only if three conditions are satisfied. These conditions are:

- The presence of substances (potential contaminants / pollutants) that may cause harm (a Source)
- The presence of a target which may be harmed e.g. site residents, groundwater (a Receptor)
- A linkage between the Source and the Receptor e.g. ingestion of soil, inhalation of vapour (a Pathway)

5.1.3 In each case, the existence of a pollutant linkage requires that not only does both a Source and a Receptor have to exist but that a demonstrable Pathway also exists. Therefore, the presence of measurable concentrations of contaminants within the ground or groundwater environment does not automatically imply that a contamination problem exists on site.

5.1.4 The nature and importance of both pathways and receptors, which are relevant to a particular site, will vary according to the actual or intended use of the site, its characteristics and its surroundings.

5.1.5 This process of the identification of Pollutant Linkages has been applied below to assess the potential risks associated with the site.

5.2 Hazard Identification

5.2.1 Potentially contaminative current and historic processes have been identified on and within the vicinity of the site and are presented in Table 5.1.

Table 5.1: Identified Potential Hazards

Potential Hazard/Source	Location	Details
Made Ground	Onsite	Based on site history and recorded information relating to the general site area, the presence of made ground, of unknown chemical composition, is considered likely. In addition, made ground (if present) may provide a potential source of ground gas generation, subject to thickness and composition.
Potentially contaminative current and historic processes	On site	A garage is depicted on available mapping from 1970 – 1996. While information provided by the Royal Borough of Greenwich Council reports tanks associated with historic land use have been removed, the potential for residual contamination cannot be discounted.

Potential Hazard/Source	Location	Details
Potentially contaminative current and historic processes	Off site	A number of potentially contaminative historic processes (including gas works and a power station) have been identified in proximity to the site, which may provide a potential source of contamination onsite.

5.3 Potential Receptors and Pathways

5.3.1 Potential receptors identified as part of this preliminary risk assessment are:

- Current/future site users;
- Construction workers; and
- Controlled waters (Principal / Secondary Aquifers and River Thames).

5.3.2 Potential contaminant pathways relating to the identified receptors and contaminants of concern include:

- Dermal contact – contact with soil, dust or water;
- Ingestion - ingestion of soil, dust or water;
- Inhalation – inhalation of soil, dust or vapours;
- Vertical migration – e.g. seepage of contaminants at the ground surface (i.e. leakage/spillage of hydrocarbons) through cracks in hardstanding and/or leaching of contaminants within the unsaturated zone resulting in vertical contaminant migration; and
- Horizontal migration – e.g. lateral migration of contaminants within the saturated zone and along preferential pathways such as drainage pipe bedding.

5.4 Hazard Assessment and Risk Estimation

5.4.1 Potential significant pollutant linkages identified as part of this preliminary risk assessment are summarised in the Outline Site Conceptual Model presented in Table 5.2. References to risk estimations are made in accordance with the methodology presented in CIRIA publication C552 (2001) titled 'Contaminated Land Risk Assessment: A Guide to Good Practice' and summarised in Appendix E.

Table 5.2: Outline Conceptual Model (Hazard Assessment and Risk Estimation)

Potential Hazard / Source	Potential Receptor	Potential Pathway to Receptors	Associated Hazard	Scale of Impact	Potential Consequence of Source-Receptor Linkage	Potential Likelihood for Significant Source-Receptor Linkage	Risk Classification
Made Ground – on site	Current and future site users and construction workers	Exposure to potential contaminants through ingestion, inhalation and dermal contact.	Risk of harm to human health	Local	Medium	Likely: Previous investigations undertaken on and in proximity to the site report the presence of made ground to depths of up to 2.0mbgl. In addition, a number of elevated contaminant concentrations were reported. Therefore, the risk to human health from made ground cannot be discounted at this stage.	Moderate Risk
	Future site end users and proposed development	Migration, ingress and inhalation of ground gasses.	Risk of harm to human health	Local	Medium to Severe	Low Likelihood: Made ground, if present, may provide a potential source of ground gas subject to thickness and composition.	Low to Moderate Risk
	Controlled waters	Migration of potential contaminants along vertical and horizontal pathways and infiltration of water through the unsaturated zone	Risk to controlled waters (Secondary and Principal Aquifer and River Thames)	Local to Regional	Medium	Low Likelihood to Likely: Given potential for made ground across the site and the reported presence of underlying Principal and Secondary Aquifers; as well as the presence of the River Thames to the north, the risk to controlled waters from potential leachable contaminants within the made ground cannot be discounted at this stage.	Low to Moderate Risk
Potentially contaminative current and historic processes – on site	Future site end users, construction and proposed development Controlled waters	Potential presence and migration of residual contamination Migration of potential contaminants along vertical and horizontal pathways and infiltration of water through the unsaturated zone	Risk of harm to human health and controlled waters Risk to controlled waters (Secondary and Principal Aquifer and River Thames)	Local to Regional	Medium	Low Likelihood to Likely: The northern part of the site is understood to have contained a garage in the past. While information provided by the Local Authority indicates that tanks associated with this former land use have been removed, the potential for localised contamination cannot be fully discounted at this stage.	Low to Moderate Risk

Potential Hazard / Source	Potential Receptor	Potential Pathway to Receptors	Associated Hazard	Scale of Impact	Potential Consequence of Source-Receptor Linkage	Potential Likelihood for Significant Source-Receptor Linkage	Risk Classification
Potentially contaminative current and historic processes – off site	Current and future site users	Exposure to potential contaminants through ingestion, inhalation and dermal contact.	Risk of harm to human health	Local	Medium	Low Likelihood to Likely: Potentially contaminative current and historic processes have been recorded in proximity to the site (e.g. former gas works and power station). Therefore, potential on site migration of contaminants / ground gas from these potential off site sources cannot be fully discounted at this stage.	Low to Moderate Risk
	Controlled waters	Migration of potential contaminants along vertical and horizontal pathways and infiltration of water through the unsaturated zone	Risk to controlled waters (Secondary and Principal Aquifer and River Thames)	Local to Regional	Medium	Low Likelihood: Given the granular nature of the underlying Thanet Formation, the potential for onsite migration of contaminants from offsite sources cannot be discounted.	Low to Moderate Risk

6 INTRUSIVE INVESTIGATION

6.1 Background

6.1.1 The ground investigation undertaken was designed to provide specific information regarding site conditions in support of the proposed site development.

6.1.2 In particular, the investigation was designed to provide further information on:

- Ground conditions to aid with the design of the development; and
- The potential significant pollutant linkages identified as part of the Preliminary Risk Assessment.

6.1.3 All site works were undertaken in accordance with BS5930:2015, BS10175+A1 (2013) and, where appropriate, Eurocode 7. Works were supervised by a suitably experienced geoenvironmental consultant from TEC.

6.2 Methodology

6.2.1 Intrusive works were undertaken between 03 March and 09 March 2016 and comprised the advancement of a single cable percussive borehole to a depth of 21.5mbgl to allow for the characterisation and description of underlying ground conditions and for the collection of near surface and deeper materials for geo-chemical and geotechnical analysis.

6.2.2 In addition, 9No. dynamic sample boreholes were advanced to a maximum depth of 5.0mbgl to allow for the characterisation of underlying ground materials, to confirm the thickness of made ground across the site and for the collection of near surface and shallow ground materials for geo-chemical testing and geotechnical testing. Combined ground gas and groundwater monitoring wells were installed in a number of excavated boreholes to allow for a preliminary assessment of potential ground gas and groundwater issues at the site.

6.2.3 Exploratory hole locations were limited in areas of the site due to the presence of existing buildings, high voltage cables and access restrictions due to construction works being undertaken on the site and the time of the investigation. The presence of the hotel structure prevented further investigation within the area assumed to relate to the garage reported by Subadra.

6.2.4 In addition, due to the presence of Crossrail tunnels beneath and in proximity to the site, intrusive works within the northern section of the site were restricted to a maximum depth of 5.0mbgl.

6.2.5 Exploratory hole locations are presented in Figure 2 and a detailed description of encountered ground conditions are shown on exploratory hole logs presented in Appendix F.

6.3 Field Testing

6.3.1 A MiniRAE Lite (10.6eV UV lamp) photo-ionisation detected (PID) was used on site to screen soil samples for the presence of total volatile organic compounds (VOC's), prior to laboratory testing. The corresponding results are presented on the exploratory hole logs in Appendix F.

6.3.2 Standard Penetration Tests (SPTs) were undertaken at regular intervals between 1.0mbgl and 21.5mbgl within the cable percussive boreholes to gain an indicative strength profile of the underlying materials.

6.3.3 Ground gas monitoring and the gauging of groundwater levels has been undertaken within installed boreholes (BH01 and WS03, WS05 and WS06) on three occasions. In addition, groundwater samples were collected from the deeper monitoring well (BH01) to allow for a preliminary assessment of the potential risk to controlled waters.

6.4 General Sampling

6.4.1 Soil samples were collected directly into pre-labelled sample containers. During the course of the sampling care was taken to minimise head space of the sample containers. Once filled sample containers were placed within cool boxes containing ice packs to maintain as cool a temperature as possible, nominally 4^{o}C.

6.4.2 Samples were collected by courier for delivery to the selected laboratories. All samples were accompanied by detailed chain of custody sheets.

6.5 Chemical Testing

6.5.1 Laboratory testing was scheduled on the basis of the findings of previous investigation works and field observations.

6.5.2 Representative soil samples were collected and chemically tested at i2 Analytical Ltd, a UKAS/MCERTS accredited laboratory, for a selection of the following parameters:

Soils (Totals and Leachate)

- Heavy metals (arsenic, chromium, cadmium, copper, lead, selenium, zinc, barium, mercury, nickel, beryllium, vanadium and water soluble boron);
- Phenol (monohydric), cyanide (total, free and complex), water soluble sulphate, sulphide, total organic carbon, pH;
- Speciated Polycyclic Aromatic Hydrocarbons (PAHs);
- Total Petroleum Hydrocarbons (TPH);
- Volatile Organic Compounds (VOC's) and Semi Volatile Organic Compounds (SVOC's); and
- Asbestos Fibre Screen.

Waters

- Heavy metals (arsenic, chromium, cadmium, copper, lead, selenium, zinc, barium, mercury, nickel, beryllium, vanadium and water soluble boron);
- Phenol (monohydric), cyanide (total), water soluble sulphate, sulphide, total organic carbon, pH;
- Speciated Polycyclic Aromatic Hydrocarbons (PAHs); and
- Total Petroleum Hydrocarbons (TPH);

6.5.3 Geochemical certificates of analysis are presented Appendix G.

6.6 Geotechnical Testing

6.6.1 Selected soil samples were submitted for geotechnical analysis at K4 Soils Laboratory. Laboratory testing was scheduled upon the basis of field observations for a selection

of the following:

- Particle Size Distribution;
- Shear Strength (direct shear); and
- Sulphate / pH tests.

6.6.2 Soil geotechnical certificates of analysis are presented in Appendix H.

7 ENCOUNTERED GROUND CONDITIONS

7.1 Introduction

7.1.1 A summary of encountered ground conditions for the site is provided below.

7.1.2 Detailed descriptions of encountered ground conditions are shown on exploratory hole logs presented in Appendix F.

Made Ground

7.1.3 Made ground was encountered across the site to a maximum observed depth of 2.8mbgl (WS07) and was generally observed to comprise tarmacadam hardstanding / slightly silty gravelly sandy clay underlain by slightly silty slightly clayey gravelly sand / sandy gravel. Gravel was observed to include red brick, concrete, black carbonaceous material, chert, sandstone, ceramic and glass.

Natural Ground

7.1.4 The natural ground was encountered from a depth of 1.5mbgl and was generally observed to comprise loose to medium dense light brown to orangish brown gravelly fine to medium sand to a maximum observed depth of 3.6mbgl (BH01). The gravel was observed to comprise sub-angular to sub-rounded chert. This in turn was observed to be underlain by medium dense to very dense pale brown, locally orange, slightly silty fine to medium glauconitic sand associated with the Thanet Formation.

7.1.5 A band of light brown sandy gravel of rounded chert was recorded at the base of the Thanet, considered to be associated with the Bullhead Beds at a depth of 15.0-16.2mbgl within the cable percussive borehole. This was noted to be underlain by weak, low to medium density chalk with moderate gravel and cobbles of flint to the base of the BH01a (21.5mbgl).

7.2 Generalised Ground Profile

7.2.1 The general ground profile encountered at the site is summarised in Table 7.1 below.

Table 7.1: Generalised Ground Profile

Depth (mbgl)	Encountered Material
0 – 2.8	Made Ground: Tarmacadam / Gravel underlain by slightly silty, slightly clayey gravelly sand / sandy gravel.
1.5 – 3.6	Kempton Park Gravel: Medium dense to very dense gravelly sand / sandy gravel of chert.
2.7 – 15.0	Thanet Sand Formation: Medium dense to very dense fine grained glauconitic sand.
15.0 – 16.2	Bullhead Bed: Sandy gravel of chert.
16.2 - >21.5	White Chalk Subgroup: Weak low to medium density chalk with gravel ad cobbles of flint.

7.3 Groundwater and Perched Water

7.3.1 Water strikes encountered during the site works are shown on the exploratory hole logs in Appendix F and summarised in Table 7.2 below.

Table 7.2: Groundwater Strikes

Location	Date	Groundwater Strike (mbgl)	Strata
BH01	08/03/2016	10.4	Thanet Sand

7.3.2 Following completion of the site works, groundwater monitoring and sampling was undertaken as part of the ground gas monitoring. The results of the monitoring are presented in Appendix I and Table 7.3.

Table 7.3: Groundwater Levels

Location	Date	Groundwater Levels (mbgl)	Strata
BH01	31/03/2016	10.29	Thanet Sand
	15/04/2016	10.32	
	20/04/2016	10.15	
WS03	31/03/2016	Dry	Kempton Park Gravel
	15/04/2016	Dry	
	20/04/2016	Dry	
WS05	31/03/2016	Dry	Kempton Park Gravel
	15/04/2016	Dry	
	20/04/2016	Dry	
WS06	31/03/2016	Dry	Kempton Park Gravel
	15/04/2016	Dry	

7.3.3 Groundwater level gauging undertaken within installed monitoring wells reported the shallow wells, installed within the Kempton Park Gravel to be dry on all occasions. Monitoring undertaken within the deeper well installed within the Thanet Sand, recorded groundwater levels of between 10.15mbgl and 10.32mbgl.

7.4 Contamination Summary

7.4.1 Olfactory evidence of hydrocarbon contamination was recorded within WS04, noted to be in proximity of the former garage within the northern section of the site, from a depth of 0.8mbgl. Field screening of total Volatile Organic Compounds (VOC's) using a photo-ionisation detector (PID) recorded concentrations of up to 68.2ppm within this material. Notwithstanding this, laboratory analysis of this material reported the lower banded TPH concentrations considered to be associated with petroleum (i.e. C5 – C10) as below laboratory limit of detection, while elevated concentrations of heavier ended TPH (i.e. C12 – C35) were all reported below the current screening values considered appropriate for the proposed site end use.

7.4.2 No further significant visual or olfactory evidence of contamination was recorded during the intrusive investigation. All further field screening of total VOCs using the PID recorded concentrations of 0.0ppm within screened soil samples, i.e. below the limit of detection of the instrument.

8 CONTAMINATION CHARACTERISATION

8.1 Legislation

8.1.1 Contaminated Land is defined in Part IIA of the Environmental Protection Act (1990) as:

8.1.2 "Any land which appears to the Local Authority in whose area it is situated to be in such a condition, by reasons of substances in, on or under the land that:

- Significant harm is being caused or there is a significant possibility of such harm being caused;

or

- *significant pollution of controlled waters is being caused or there is a significant possibility of such pollution being caused."

*Section 86 of the Water Act 2003 amends section 78A of Environmental Protection Act 1990 for Controlled Waters.

8.2 Generic Quantitative Risk Assessment

Human Health Screening

8.2.1 Current legislation and guidance on the assessment of contaminated land promotes a tiered risk approach (CLR 11). The generic quantitative risk assessment comprises a screening of identified contaminants against generic guideline values that are appropriate to the site setting and the receptors concerned. For risks to human health the basis for these generic guideline values are the methodologies set out by the Environment Agency's Contaminated Land Exposure Assessment (CLEA) guidelines.

8.2.2 The following regulatory and industry guidance has been utilised for the selection of Generic Assessment Criteria utilised as part of the GQRA. The order of the guidance listed is in terms of hierarchy for selection of GACs (where the land uses and parameters are considered most applicable).

1. Category 4 Screen Levels (C4SLs) – DEFRA (2014)
2. Soil Guidance Values (SGVs) – Environment Agency (2009)
3. Suitable For Use Levels (S4ULs) – LQM/CIEH (2015)
4. EIC/AGS/CL:AIRE GAC (2009)

8.2.3 The C4SLs for arsenic, cadmium, chromium (VI) and lead have been utilised as part of the GQRA. Benzene and benzo(a)pyrene C4SLs have not been utilised as part of the Tier 1 screening as they are based upon 6% soil organic matter (SOM) as opposed to 1% SOM utilised by LQM/CIEH (2015).

8.2.4 SGVs have been utilised, where appropriate, for dioxins, furans and dioxin-like PCBs; nickel; inorganic mercury and selenium (residential SGV used for proposed residential end use). SGVs for organic compounds are not utilised as they are derived using a 6% soil organic matter as opposed to 1% SOM utilised by LQM/CIEH (2015).

8.2.5 In the absence of a published UK derived GAC for cyanide, the GQRA for total cyanide is based upon comparison of recorded values against the Dutch Intervention Value for free cyanide (VROM 2000).

8.2.6 S4ULs and EIC/AGS/CL:AIRE GACs are adopted for the remaining potential contaminants using the hierarchy noted above.

8.2.7 The purpose of the site investigation was to provide information to establish the suitability of the site for a residential development. Therefore, the standard land use for the site, for use in the generic assessment, has been defined as "Residential without homegrown produce" in accordance with current guidance.

Controlled Waters Screening

8.2.8 Risks to controlled waters have been assessed following current Environment Agency guidance such as "Remedial Targets Methodology – Hydrogeological Risk Assessment for Land Contamination". This guidance describes a tiered approach to the assessment and, if necessary, derivation of clean up targets for soils and groundwater with the emphasis on the protection of controlled waters.

8.2.9 In accordance with Environment Agency guidance, a Level 1 soil (leachability) and Level 2 groundwater generic screening assessment has been undertaken, based on the findings of the sampling undertaken as part of this phase of works, to identify the contaminants of concern that may pose a risk to controlled waters. This assessment has been undertaken by the comparison of soil leachate and groundwater contaminant concentrations with criteria applicable to the long term protection of water quality.

8.2.10 Based on our conceptual understanding, the nearest significant controlled water receptor is considered to be the underlying aquifers and nearby River Thames. Therefore, analytical results have been assessed against River Basin Districts Typology, Standards and Groundwater Threshold Values (Water Framework Directive) (England and Wales) Direction 2010, where available. Where such standards are not available, analytical results have been assessed against The Water Supply (Water Quality) Regulations 2010.

Ground Gas Screening

8.2.11 An initial qualitative risk screening assessment based upon the methodology for characterising gassing sites detailed within the following documents has been undertaken:

- CIRIA Report C665 (2007) 'Assessing risks posed by hazardous ground gases to buildings (revised)';
- NHBC (March 2007) 'Guidance on evaluation of development proposals on sites where methane and carbon dioxide are present';
- BS8485:2015 'Code of Practice for the characterisation and remediation from ground gas in affected developments';
- BS8576:2013 'Guidance on investigations for ground gas – Permanent gases and Volatile Organic Compounds (VOCs)'; and
- Wilson S., Card C. and Haines S. (2009) 'Ground Gas Handbook'.

8.2.12 The objectives of the screening assessment are to provide a general characterisation of the ground materials within the site based on the investigation works undertaken to-date. This information is used to provide a preliminary assessment of gassing potential for the materials encountered at the site. This, together with ground gas data collected as part of the monitoring undertaken to date, is used to provide a qualitative conceptual model of identified risk in relation to the proposed development.

8.3 Soil Analysis - Human Health

8.3.1 Soil samples were collected and analysed from made ground materials. Certificates of analysis for samples are contained within Appendix G.

8.3.2 Current regulatory guidance for the statistical assessment of environmental data within a contaminated land context is detailed within the CIEH and CL:AIRE joint publication titled 'Guidance on Comparing Soil Concentration Data with a Critical Concentration' (2008). However, as judgemental sampling has been undertaken, statistical assessment as detailed in CL:AIRE (2008) has not been carried out as part of this assessment. Therefore, to identify Contaminants of Potential Concern (COPC) as part of this preliminary assessment, the analytical results for the ground materials sampled have been assessed by the screening of individual analyses against the relevant Tier 1 Site Screening Values (SSVs) adopted.

8.3.3 For generic assessment purposes, SSVs have been conservatively selected, where appropriate, based upon a sandy soil and Soil Organic Matter (SOM) of 1%.

Made Ground

8.3.4 8No. samples of made ground were scheduled for analysis from the site. The results obtained from made ground are summarised in Table 8.1 below:

Table 8.1: Soil Analysis Summary

Contaminant	Max (mg/kg)	Min (mg/kg)	SSV[1] (mg/kg)	No. of Tests	No. of Exceedances
Arsenic	29	4.6	40(1)	8	0
Boron	1.7	>0.2	11000(3)	8	0
Cadmium	<0.2	<0.2	150(1)	8	0
Chromium	<1.2	<1.2	910(3)	8	0
Copper	120	20	7100(3)	8	0
Lead	300	66	310(1)	8	0
Mercury	0.6	<0.3	170(2,6)	8	0
Nickel	44	8.3	130(2,6)	8	0
Selenium	<1.0	<1.0	350(2,6)	8	0
Zinc	150	17	40000(3)	8	0
Beryllium	1.3	0.3	1.7(3)	8	0
Vanadium	69	18	1200(3)	8	0
Barium	220	27	1300(4)	8	0
Cyanide (Total)	<1	<1	20(5)	8	0
Total Phenol (Monohydric)	<1.0	<1.0	440(3)	8	0
Water Soluble Sulphate (SO_4) – g/l	1.2	0.042	-	8	0
Sulphide	130	<1.0	-	8	0
pH	10.1	5.9	-	8	0
Naphthalene	<0.05	<0.05	2.3(3)	8	0
Acenaphthylene	0.19	<0.10	2900(3)	8	0
Acenaphthene	0.44	<0.10	3000(3)	8	0
Fluorene	0.34	<0.10	2800(3)	8	0
Phenanthrene	3.8	<0.10	1300(3)	8	0
Anthracene	1.4	<0.10	31000(3)	8	0
Fluoranthene	7.9	<0.10	1500(3)	8	0
Pyrene	7.2	<0.10	3700(3)	8	0

Contaminant	Max (mg/kg)	Min (mg/kg)	SSV[1] (mg/kg)	No. of Tests	No. of Exceedances
Benzo(a)anthracene	3.4	<0.10	11[(3)]	8	0
Chrysene	3.6	<0.05	30[(3)]	8	0
Benzo(b)fluoranthene	3.0	<0.10	3.9[(3)]	8	0
Benzo(k)fluoranthene	2.2	<0.10	110[(3)]	8	0
Benzo(a)pyrene	3.0	<0.10	3.2[(3)]	8	0
Indeno(1,2,3-cd)pyrene	1.5	<0.10	45[(3)]	8	0
Dibenz(a,h)anthracene	0.27	<0.10	0.31[(3)]	8	0
Benzo(g,h,i)perylene	1.8	<0.05	360[(3)]	8	0
Total PAH	40.0	<1.6	-	8	0
Benzene	<1.0	<1.0	0.38[(3)]	8	0
Toluene	<1.0	<1.0	880[(3)]	8	0
Ethylbenzene	<1.0	<1.0	83[(3)]	8	0
p & m-xylene	<1.0	<1.0	79[(3)]	8	0
o-xylene	<1.0	<1.0	88[(3)]	8	0
MTBE	<1.0	<1.0	73[(4)]	8	0
TPH Aliphatic C5-C6	<0.1	<0.1	42[(3)]	8	0
TPH Aliphatic C6-C8	<0.1	<0.1	100[(3)]	8	0
TPH Aliphatic C8-C10	<0.1	<0.1	27[(3)]	8	0
TPH Aliphatic C10-C12	12	<1.0	130[(3)]	8	0
TPH Aliphatic C12-C16	26	<2.0	1100[(3)]	8	0
TPH Aliphatic C16-C21	45	<8.0	65000[(3)]	8	0
TPH Aliphatic C21-C35	310	<10		8	0
TPH Aromatic C5-C7	<0.1	<0.1	370[(3)]	8	0
TPH Aromatic C7-C8	<0.1	<0.1	860[(3)]	8	0
TPH Aromatic C8-C10	<0.1	<0.1	47[(3)]	8	0
TPH Aromatic C10-C12	2.3	<1.0	250[(3)]	8	0
TPH Aromatic C12-C16	10	<2.0	1800[(3)]	8	0
TPH Aromatic C16-C21	45	<10	1900[(3)]	8	0
TPH Aromatic C21-C35	120	<10	1900[(3)]	8	0
TPH (C10-C40)	730	<10	-	8	0

Notes:

1 DEFRA C4SLs (2014) based on "Residential without homegrown produce" end use
2 Environment Agency SGVs (2009) based on "Residential" end use
3 LQM/CIEH S4ULs (2015) based on "Residential without homegrown produce" end use
4 CL:AIRE, AGS & EIS (2009) based on "Residential" end use
5 Dutch Intervention Value for free cyanide (VROM 2000)
6 Reported as Laboratory Limit of Detection (LOD)

8.3.5 No exceedances of the Tier 1 SSVs for a residential site end use without homegrown produce has been recorded within sampled made ground materials. In addition, PCBs were reported as below laboratory limit of detection within all sampled materials. In addition, while elevated Total Volatile Organic Carbons (VOCs) were reported within WS04 (max. 68.2ppm), laboratory analysis of this material reported no exceedances of the Tier 1 SSVs for a residential site end use.

8.3.6 Notwithstanding this, an asbestos screen undertaken on all sampled made ground materials reported the presence of Chrysotile and Amosite fibres in 3No. Samples.

8.4 Soil Analysis - Controlled Waters (Leachability)

8.4.1 3No. samples obtained from the made ground were scheduled for leachability analysis. The certificate of analysis is shown in Appendix G with a comparison of results with Tier 1 SSVs shown below in Table 8.2.

Table 8.2: Made Ground Leachability Analysis

Contaminant	Max (µg/l)	Min (µg/l)	SSV[1] (µg/l)	No. of Exceedances
Arsenic	12	1.7	50	0
Boron	48	<10	2000	0
Cadmium	<0.08	<0.08	0.15[5]	0
Chromium	3.0	<0.4	3.4	0
Copper	28	3.3	10	1
Lead	19	4.0	7.2	2
Mercury	<0.05	<0.05	0.05	0
Nickel	8.8	<0.3	20	0
Selenium	<4.0	<4.0	10[3]	0
Zinc	<0.4	<0.4	75[5]	0
Beryllium	<0.2	<0.2	-	0
Vanadium	34	<1.7	20	1
Barium	170	16	-	-
Cyanide (Total)	<10	<10	1	0
Total Phenol (Monohydric)	<10	<10	7.7	0
Sulphate as SO_4	62100	7890	400000	0
Sulphide	<5.0	<5.0	-	-
pH	8.9	7.7	-	-
Naphthalene	<0.01[4]	<0.01[4]	2.4	0
Acenaphthylene	<0.01[4]	<0.01[4]	-	-
Acenaphthene	<0.01[4]	<0.01[4]	-	-
Fluorene	<0.01[4]	<0.01[4]	-	-
Phenanthrene	<0.01[4]	<0.01[4]	-	-
Anthracene	<0.01[4]	<0.01[4]	0.1	0
Fluoranthene	<0.01[4]	<0.01[4]	0.1	0
Pyrene	<0.01[4]	<0.01[4]	-	-
Benzo(a)anthracene	<0.01[4]	<0.01[4]	-	-
Chrysene	<0.01[4]	<0.01[4]	-	-
Benzo(b)fluoranthene	<0.01[4]	<0.01[4]	0.03	0
Benzo(k)fluoranthene	<0.01[4]	<0.01[4]		0
Benzo(a)pyrene	<0.01[4]	<0.01[4]	0.05	0
Indeno(1,2,3-cd)pyrene	<0.01[4]	<0.01[4]	0.002	0
Benzo(g,h,i)perylene	<0.01[4]	<0.01[4]		0
Dibenz(a,h)anthracene	<0.01[4]	<0.01[4]	-	-
Total PAH	<0.2[4]	<0.2[4]	-	-

Notes:

1 SSV based upon Environment Agency EQS for Surface Waters (H1 Annex D1: Assessment of Hazardous Pollutants within Surface Water Discharges V2.0 (October 2014)), unless otherwise stated
2 Groundwater Threshold Values from The Water Framework Directive (England and Wales) Directions (2010)
3 The Water Supply (Water Quality) Regulations 2010
4 Laboratory Limit of Detection
5 Based upon a water hardness of between 100 to 250mg $CaCO_3$/l

8.4.2 While all analysed materials reported concentrations of leachable PAH and TPH below laboratory limit of detection, a number of elevated leachable concentrations of heavy metals have been recorded within samples of the made ground, in relation to the current SSV for the site. These are detailed below:

- Copper – WS08 at 0.4-0.5mbgl (28µg/l);
- Lead – WS08 at 0.4-0.5mbgl (15µg/l) and WS06 at 0.8-1.0mbgl (19µg/l); and
- Vanadium - WS08 at 0.4-0.5mbgl (34µg/l).

8.5 Controlled Waters - Groundwater Analysis

8.5.1 Groundwater samples were taken from a single location. Certificates of analysis are contained in Appendix G with results being summarised below in Table 8.3.

Table 8.3: Groundwater Analysis Summary

Contaminant	BH01a (µg/l)	SSV (µg/l)(1)	No. of Exceedances
Arsenic	9.97	199	0
Boron	160	750	0
Cadmium	<0.02	1.1	0
Chromium (III)	<5.0	27.6	0
Chromium (VI)	<0.2	-	-
Copper	<0.5	57.8	0
Lead	0.2	39.8	0
Mercury	0.17	0.75	0
Nickel	9.9	116	0
Selenium	0.9	10(2)	0
Zinc	2.2	414	0
Beryllium	0.1	-	-
Vanadium	0.2	-	-
Barium	43	-	-
Cyanide (Total)	<10	50(2)	0
Total Phenol (Monohydric)	<10	82.8	0
Sulphate (as SO4)	444000	500000(4)	0
Sulphide	<5.0	-	-
pH	7.2	-	-
Naphthalene	<0.01	13.2	0
Acenaphthylene	<0.01	-	-
Acenaphthene	<0.01	-	-
Fluorene	<0.01	-	-
Phenanthrene	<0.01	-	-
Anthracene	<0.01	0.55	0
Fluoranthene	<0.01	0.6	0
Pyrene	<0.01	-	-
Benzo(a)anthracene	<0.01	-	-
Chrysene	<0.01	-	-
Benzo(b)fluoranthene	<0.01	-	-
Benzo(k)fluoranthene	<0.01	-	-
Benzo(a)pyrene	<0.01	0.075	0
Indeno(1,2,3-cd)pyrene	<0.01	-	-
Dibenz(a,h)anthracene	<0.01	-	-

Contaminant	BH01a (µg/l)	SSV (µg/l)(1)	No. of Exceedances
Benzo(g,h,i)perylene	<0.01	-	-
Benzene	<1.0	55.2	0
Toluene	<1.0	276	0
Ethylbenzene	<1.0	300(3)	0
p & m-xylene	<1.0	166	0
o-xylene	<1.0	-	-
MTBE	<1.0	-	-
TPH Aliphatic C5-C6	<10	15000(3)	0
TPH Aliphatic C6-C8	<10	15000(3)	0
TPH Aliphatic C8-C10	<10	300(3)	0
TPH Aliphatic C10-C12	<10	300(3)	0
TPH Aliphatic C12-C16	<10	300(3)	0
TPH Aliphatic C16-C21	<10	-	-
TPH Aliphatic C21-C35	<10	-	-
TPH Aromatic C5-C7	<10	50(3)	0
TPH Aromatic C7-C8	<10	276(3)	0
TPH Aromatic C8-C10	<10	-	-
TPH Aromatic C10-C12	<10	100(3)	0
TPH Aromatic C12-C16	<10	100(3)	0
TPH Aromatic C16-C21	<10	90(3)	0
TPH Aromatic C21-C35	<10	90(3)	0

Notes:

1 SSV based upon Groundwater Threshold Values from The Water Framework Directive (England and Wales) Directions (2010), unless otherwise stated.
2 The Water Supply (Water Quality) Regulations 2010
3 WHO Guideline Values for petroleum products in drinking water
4 WHO Guideline Values for sulphate in drinking water − based on the value at which an increasing likelihood of complaints reportedly arise from a noticeable taste
5 Laboratory Limit of Detection

8.5.2 No exceedances of the relevant screening values have been recorded within the groundwater sampled from the site. Furthermore, all concentrations of PAH and TPH have been recorded as below laboratory limit of detection (<LOD).

8.6 Ground Gas

8.6.1 3No rounds of ground gas monitoring have been undertaken to date.

8.6.2 All gas monitoring was undertaken using a calibrated GFM 430 infra-red gas analyser fitted with an internal flow pod. The monitoring results are presented in Appendix I and summarised in Table 8.4 below.

Table 8.4: Summary of Ground Gas Monitoring Data

BH01a	Natural	None	3	0	2.4	18.7	1.2	10.15 – 10.32	994 – 1027
WS03	Natural	None	3	0	4.2	15.2	0.3 (0.0)[1]	Dry	994 – 1027

WS05	Natural	None	3	0	2.5	18.3	0.0	Dry	994 – 1027
WS06	Natural	None	2	0	1.1	19.9	0.1 (0.0)[1]	Dry	994 – 1027

8.6.3 Atmospheric pressures ranged between 994mb and 1027mb during the course of the monitoring visits. The maximum positive and stable flow rate recorded was 1.2l/hr within BH01a.

8.6.4 No measurable concentrations of methane were recorded during the monitoring (i.e. below the limit of detection of the instrument (0.0%v/v)). The methane concentrations recorded are below the screening levels presented in current guidance for a high sensitivity end use (i.e. 1% methane for housing).

8.6.5 Elevated concentrations of carbon dioxide were recorded within all monitoring wells with a maximum concentration of 4.2%v/v recorded within WS03. The carbon dioxide concentrations recorded are below the screening levels presented in current guidance for a high sensitivity end use (i.e. 5% carbon dioxide for housing).

8.6.6 No elevated concentrations of hydrogen sulphide, carbon monoxide or Lower Explosive Limit (%LEL) were recorded during the monitoring visits.

8.6.7 Based on the gas monitoring undertaken to date, the proposed development would be characterised, in accordance with current guidance (CIRIA C665) as having a maximum Gas Screening Value of 0.0l/hr for methane and 0.0504l/hr for carbon dioxide (based on maximum flow rates of 1.2/hr, 0.0%v/v methane and 4.2%v/v carbon dioxide), irrespective of location.

8.6.8 Total Organic Carbon (TOC) content derived from laboratory data of the encountered made ground materials on ranged from <0.1% to 1.1%. This would be considered to represent a very low generation potential in accordance with BS8576:2013.

8.6.9 In accordance with current guidance (Wilson, Card and Haines (2009) and BS8576: 2013), the natural ground (Thanet Sand Formation) recorded to underlie the site may be classified as being low with a very low reported level of risk for on site development and a negligible reported risk of lateral migration.

8.6.10 Therefore, based on the assessment undertaken to date and in relation to the made ground and natural ground encountered, the site may be classified as Characteristic Situation 1 in accordance with current guidance and gas protection measures are not required to be incorporated within proposed development structures.

8.6.11 Notwithstanding this, given the TPH concentrations reported by Subadra (2007), the risk to proposed structures from possible vapours, cannot be discounted.

8.6.12 Also, the ground gas generation potential of the made ground encountered on site is considered to be very low based on its recorded composition and generally limited thickness.

8.6.13 The site is not reported to be located within a radon affected area, as less than 1% of homes are reported to be above the Action Level. Consequently, no radon protective

measures are reported as necessary within the construction of new dwellings or extensions.

9 REFINED CONCEPTUAL MODEL

9.1 Introduction

9.1.1 The Preliminary Risk Assessment undertaken as part of this report identified the presence of potential significant pollutant linkages associated with the site and surrounds. Therefore, in accordance with the approach recommended in CLR11, additional information was collected about the site and its surroundings as part of a Generic Quantitative Risk Assessment. Based upon this additional information and the proposed development layout, the site conceptual model has been refined and pollutant linkages confirmed for evaluation where considered necessary.

9.2 Hazard Identification

9.2.1 Potential sources of contamination have been identified on and within the vicinity of the site and are presented in Table 9.1.

Table 9.1: Identified Hazards

Identified Hazard/Source	Location	Details
Made Ground	On site	Made ground was encountered across the site to a maximum observed depth of 2.8mbgl. No exceedances of the Tier 1 SSVs for a residential site end use without homegrown produce were recorded within sampled made ground materials. Notwithstanding this, loose Amosite and Chrysotile fibres were detected in a number of locations. Elevated leachable contaminants were recorded within made ground samples sampled from site including a number of heavy metals. Notwithstanding this, groundwater monitoring undertaken as part of these works recorded no exceedances of the relevant screening criteria. The made ground encountered on site is not considered to be a potential significant source of ground gas based on its observed composition (i.e. low degradable organic content) and generally limited thickness.
Former Garage Site	On site	Visual or olfactory evidence of potential contamination associated with the former garage onsite was restricted to a hydrocarbon odour and marginally elevated TVOC concentrations in a single location (WS04). Notwithstanding this, further contamination, as detailed within the Subadra (2007) report cannot be discounted.

Identified Hazard/Source	Location	Details
Potentially contaminative current and historic processes	On and Off site	Potentially contaminative current and historic land uses have been identified on and within proximity of the site. Notwithstanding this, no evidence of significant contamination has been encountered aside from noted above.

9.3 Identified Potential Receptors and Pathways

9.3.1 Potential receptors identified as part of the generic risk assessment are:

- Current/future site users;
- Construction workers; and
- Controlled waters (Principal / Secondary Aquifer and River Thames)

9.3.2 Potential contaminant pathways identified as part of the generic risk assessment include:

- Dermal contact – contact with soil, dust or water;
- Ingestion - ingestion of soil, dust or water;
- Inhalation – inhalation of soil, dust or vapours;
- Vertical migration – seepage of contaminants at the ground surface (i.e. leakage/spillage of hydrocarbons) through cracks in hardstanding and/or leaching of contaminants within the unsaturated zone resulting in vertical contaminant migration; and
- Horizontal migration – lateral migration of contaminants within the saturated zone and along preferential pathways such as drainage pipe bedding.

9.4 Hazard Assessment and Risk Estimation

9.4.1 Potential significant pollutant linkages identified following completion of the intrusive works are summarised in the Refined Site Conceptual Model presented in Table 9.2.

Table 9.2: Refined Conceptual Model (Hazard Assessment and Risk Estimation)

Identified Hazard / Source	Identified Receptor	Potential Pathway to Receptors	Associated Hazard	Scale of Impact	Potential Consequence of Source-Receptor Linkage	Potential Likelihood for Significant Source-Receptor Linkage	Risk Classification
Made Ground	Future site end users and construction workers	Exposure to potential contaminants through ingestion, inhalation and dermal contact	Risk of harm to human health	Local	Medium	Likely: No exceedances of the Tier 1 SSVs for a residential site end use have been recorded within analysed made ground although three samples did record the presence of asbestos. Therefore, where made ground remains in proposed soft landscaped areas, after finished site levels have been achieved, exposure to potential contaminants cannot be discounted.	Low to Moderate Risk
	Controlled Waters	Infiltration of water through the unsaturated zone resulting in leaching of contaminants and potential vertical and horizontal migration along preferential pathways	Risk to Principal and Secondary Aquifer and River Thames	Local to regional	Medium	Unlikely: Whilst marginally elevated leachable contaminant concentrations of a number of heavy metals have been recorded on site groundwater monitoring has indicated no significant impact upon groundwater.	Low Risk
	Future site end users and proposed development	Migration, ingress and inhalation of ground gasses.	Risk of harm to human health	Local	Medium to Severe	Unlikely: Based upon the observed thickness and composition, the made ground encountered on site would not be considered a potential source of significant ground gas generation.	Low Risk
Former Garage Site	Future site end users and construction workers	Exposure to potential contaminants through ingestion, inhalation and dermal contact	Risk of harm to human health	Local	Medium	Low Likelihood: Given the absence of gross contamination within the shallow made ground materials in proximity to the former garage onsite, the risk to human health is considered low.	Low Risk
	Controlled Waters	Infiltration of water through the unsaturated zone resulting in leaching of contaminants and potential vertical and horizontal migration along preferential pathways	Risk to Principal and Secondary Aquifer and River Thames	Local to regional	Medium	Low Likelihood to Likely: Given the elevated concentrations of TPH recorded in proximity to the site during the validation works undertaken by Subadra (2007), the risk to controlled waters cannot be discounted at this stage.	Low to Moderate Risk
	Future site end users and proposed development	Migration, ingress and inhalation of ground gasses.	Risk of harm to human health	Local	Medium to Severe	Low Likelihood to Likely: Given the elevated concentrations, of volatile organic compounds recorded within the vicinity of the former garage on site, albeit at relatively low concentrations, the risk to human health and proposed structures onsite from potential vapours cannot be discounted at this stage.	Low to Moderate Risk

Identified Hazard / Source	Identified Receptor	Potential Pathway to Receptors	Associated Hazard	Scale of Impact	Potential Consequence of Source-Receptor Linkage	Potential Likelihood for Significant Source-Receptor Linkage	Risk Classification
Potentially Contaminative Land Uses – On and Offsite	Future site end users, construction workers and controlled waters	Potential on-site contaminant migration from potential off-site sources	Risk of harm to human health and controlled waters	Local	Medium	Unlikely: Potentially contaminative current and historic land uses have been identified in proximity to the development site. Notwithstanding this, laboratory test results, field test data and visual/ olfactory observations during the intrusive investigation suggest no potential on-site contaminant migration.	Low Risk

10 GROUND ENGINEERING

10.1 Proposed Development

10.1.1 The proposed development is understood to comprise the construction of two structures up to twelve stories in height with basement, associated hard infrastructure and communal soft landscaping

10.1.2 It is understood that the proposed structures are to be supported on piled foundations extending into the underlying Thanet Sand and Chalk deposits.

Site Preparation

10.1.3 The development area of K1 and K2 is currently occupied by a number of cabins utilised by sub-contractors for storage and office space in the south and Berkeley Homes project offices and welfare facilities in the north. The ground within this area is primarily covered by tarmacadam hardstanding. Removal of this hardstanding and the temporary buildings will be required prior to the development works.

10.1.4 A number of obstructions were encountered suggesting that substructure from historic developments still exist on site.

10.1.5 In addition, a number of services, including high voltage cables are present within the development area. Consideration to the removal / re-routing of these utilities will be required prior to the development works.

10.2 Ground Conditions

10.2.1 Made ground was encountered across the site to a maximum observed depth of 2.8mbgl. Superficial natural deposits were encountered from a depth of 1.5mbgl and was generally observed to comprise loose to medium dense light brown to orangish brown gravelly fine to medium sand to a maximum observed depth of 3.6mbgl (BH01). The gravel was observed to comprise sub-angular to sub-rounded chert. These superficial deposits were, in turn, observed to be underlain by medium dense to very dense pale brown, locally orange, slightly silty fine to medium glauconitic sands associated with the Thanet Formation.

10.2.2 A band of light brown sandy gravel of rounded chert, recorded at the base of the Thanet Formation, was considered to be associated with the Bullhead Beds at a depth of 15.0-16.2mbgl within BH01a. This was noted to be underlain by weak, low to medium density chalk with moderate gravel and cobbles of flint to the base of the borehole (21.5mbgl).

10.2.3 While no evidence of possible dissolution features was encountered during the current phase of works, it is noted that works undertaken by TEC in a previous phase of work (Phase 8), did report the presence of a possible dissolution feature, approximately 1.0m in thickness, at a depth of approximately 12.0mbgl at the boundary of the Thanet Sand and Chalk.

10.2.4 The general ground profile encountered at the site is summarised Table 10.1 below.

Table 10.1: Generalised Ground Profile

Depth (mbgl)	Encountered Material
0 – 2.8	Made Ground: Tarmacadam / Gravel underlain by slightly silty, slightly clayey gravelly sand / sandy gravel.
1.5 – 3.6	Kempton Park Gravel: Medium dense to very dense gravelly sand / sandy gravel of chert.
2.7 – 15.0	Thanet Sand Formation: Medium dense to very dense fine grained glauconitic sand.
15.0 – 16.2	Bullhead Bed: Sandy gravel of chert.
16.2 - >21.5	White Chalk Subgroup: Weak low to medium density chalk with gravel ad cobbles of flint.

Made Ground

10.2.5 No geotechnical testing was undertaken on samples of the made ground. However, as a part of the geochemical testing undertaken for the site, pH and sulphate testing was undertaken on samples of encountered made ground. The test data indicated sulphate concentrations in the range of 0.042g/l to 1.2g/l and pH values of 5.9 to 10.1.

Natural Strata

10.2.6 Geotechnical test results are discussed below. Geotechnical laboratory test certificates are provided in Appendix H with in-situ tests being presented on the exploratory hole logs in Appendix F of this report.

10.2.7 Laboratory analysis was conducted on 11No. samples of the underlying granular natural strata. The results of these analyses are presented in Table 10.2 below.

Table 10.2: Summary of Laboratory Test Results - Natural Strata

Test		Number of Tests	Range of Results
Particle Size Distribution	Kempton Gravel	1	See Below
	Thanet Sand	3	See Below
pH Value	Natural	5	7.22 – 7.42
SO_4 (g/l in soil)	Natural	5	0.21 – 0.57
Shear Strength φ′ (degrees) c′ (kN/m^2)	Thanet Formation	2	35 – 37 5.3 – 12
SPT ' N' Value	Made Ground	10	1 - >50
	Kempton Park Gravel	7	2 - >50
	Thanet Formation	16	2 - >50 (generally >50)
	Chalk	4	16 - >50

10.2.8 Particle Size Distribution (PSD) tests was undertaken on a single sample of the underlying Kempton Park Gravel. The results indicate the encountered material to

generally comprise slightly silty slightly clayey sandy gravel with a fines component of 1.4%, a sand component of 16.5% and gravel component of 82.1% being recorded.

10.2.9 PSD testing undertaken on three samples of the underlying Thanet Sand Formation report the encountered material to generally comprise slightly gravelly, slightly silty, sand with a gravel component ranging between 0% and 0.8%, a silt component ranging between 5.5% and 11.3% and a sand component ranging between 88.7% and 93.7% being recorded.

10.2.10 The Standard Penetration Test (SPT) 'N' results undertaken on the made ground ranged between 1 and >50.

10.2.11 SPT 'N' values recorded for the Kempton Park Gravel ranged between 2 and >50. It is noted that generally SPT 'N' values recorded for the Thanet Sand Formation, were >50 with an isolated area of lower values recorded within WS05 at a depth of approximately 2.95mbgl and 4.4mbgl. SPT 'N' results obtained for the underlying chalk ranged between 16 and >50.

10.2.12 Two direct shear strength tests were undertaken on samples of the granular natural ground recovered from the Thanet Formation and recorded shear strength parameters of $\varphi' = 35°$ and 37° and $c' = 5.3$kPa and 12kN/m^2. Further, based on correlations between Standard Penetration Test (SPT) results proposed by Schmertmann (1975) for cohesionless soils, a lower bound internal friction angle, φ', of >45° may be derived.

10.2.13 As a result of the drilling method utilised, it was not possible to recover samples suitable to determine the intact dry density/saturated moisture content of the chalk encountered at the site. However, Ground Engineering report the chalk to be of low density (Phase 5 and 6) and this has been assumed here.

10.2.14 The geochemical testing on the natural ground included the analysis for water soluble sulphate and pH testing within the natural ground. The results indicate sulphate concentrations of between 0.21g/l to 0.57g/l and pH values of between 7.22 and 7.42. Additional geochemical testing undertaken on samples of the made ground reported sulphate concentrations of between 0.042g/l to 1.2g/l and pH values of between 5.9 and 10.1.

10.3 Preliminary Foundation Design Recommendations - Building K1

10.3.1 On the basis of field observation, ground conditions encountered onsite and the potential loads associated with the proposed Building K1 (in the south-east section of the site, it is considered that a piled foundation would be the most appropriate solution due to the potentially high loads imposed by the proposed structures, founding within the underlying Thanet Sand Formation.

10.3.2 In addition, the proximity of adjacent structures and the environmental sensitivity of the site will need to be carefully considered when choosing the most appropriate pile type and it is suggested that a specialist piling contractor should be consulted regarding the piling options and detailed design of most appropriate option. Further, given the presence of the underlying Principal Aquifer, a Foundation Works Risk Assessment may be required following guidance provided by the Environment Agency.

Pile Design

10.3.3 The Thanet Formation materials were recorded as being granular in nature with Standard Penetration Tests (SPTs) of between 2 and >50 (generally >50) being recorded, which suggests a friction values (φ′) in excess of 45° (Schmertmann, 1975). However, shear box tests undertaken on recompacted material gave lower values on the range of φ′ = 35° and 37°. Previous investigations undertaken by TEC for Phase 8 recommended that a Characteristic friction value (φ′) of 37.5° would be appropriate for design while previous reports provided by Ground Engineering for Phases 5 and 6 indicate characteristic values of around 38° being recommended for pile design purposes. Based on the available site data, including that of previous investigations, it is recommended that a Characteristic friction value (φ′) of 37.5° would be appropriate for design.

10.3.4 CIRIA C574 recommends that for Upper Chalk, as encountered at the site, friction values (φ′) of between 33° and 40° with a cohesion intercept of 20kN/m^2 are typical. Consequently, it is suggested that moderately conservative design parameters of c′ = 20kN/m^2 and φ′ = 39° and worst credible parameters of c′ = 0 and φ′ = 34° would be appropriate here.

10.3.5 CIRIA Report C574 recommends that the following empirical relationship should be adopted for estimating the ultimate average shaft resistance, T_{sf}, of bored piles in medium density chalk.

$$Tsf = 0.8 \times \sigma_v'$$

where σ_v' is the average effective stress resulting from the overlying chalk.

10.3.6 Further, for CFA piles the CIRIA report recommends the ultimate average shaft resistance should be estimated from

$$Tsf = 0.45 \times \sigma_v'$$

where σ_v' is the average effective stress resulting from the overlying chalk.

10.3.7 However, the CIRIA report indicates this relationship to be proven where the ultimate average shaft resistance, T_{sf}, is below 110kN/m^2 and the average effective stress, σ_v', is below 200kN/m^2.

10.3.8 CIRIA Report C574 recognises that SPT 'N' value is an imprecise method of measuring the strength of chalk at the base of a pile. However, it also indicates that until a better, more economical method has been found, it is likely to persist. The report recommends that, subject to the limitation of the crushing strength of concrete, the following ultimate base stresses be adopted:

Bored piles - ultimate base stress, qu = 200 x 'N' kN/m^2

CFA piles - ultimate base stress, qu = 200 x 'N' kN/m^2

10.4 Ground Floor Slabs – Building K1

10.4.1 As a result of the structure being piled, the use of suspended floors are considered appropriate. Given the non plastic nature of the Kempton Park Gravel it is suggested that a minimum void of 50mm should be utilised where suspended in situ concrete flooring is incorporated into the design. Where pre-cast concrete suspended floors are used a minimum void space of 200mm should be utilised to allow for 150mm of ventilation.

10.5 Building K2 (Central section of the site)

10.5.1 Should the ground conditions within the development area of K2 be similar to those encountered during the investigative works undertaken for K1 it is considered likely that a piled foundation solution may be the most appropriate foundation solution given the potentially high loads imposed by the proposed 12 storey structure, founding within competent chalk deposits.

10.5.2 However, an intrusive investigation is recommended within the proposed development area to fully confirm underlying ground conditions and any potential engineering constraints that may be associated with the proposed development.

10.6 Excavations

10.6.1 Excavation of the materials immediately beneath the site should be achievable using conventional excavation plant.

10.6.2 It is understood that previous works (REC) for the adjacent Phase 3 site have established that the groundwater levels are tidally influenced. Based on the monitoring data to-date, groundwater levels for the general site area have been recorded at approximate depths of between 6.5mbgl and 7.0mbgl. However, groundwater monitoring undertaken as part of the current investigation on site recorded groundwater levels between 10.15mbgl and 10.54mbgl.

10.6.3 Based on the observations made during the recent intrusive works, groundwater ingress is unlikely to be a significant issue during excavation works, therefore, significant dewatering works are unlikely to be required during excavation and formation works.

10.6.4 Consideration should be given to the utilisation of appropriate temporary works during any excavation works within the made ground recorded at the site.

10.7 Protection of Buried Concrete

10.7.1 In accordance with BRE Special Digest 1, the made ground sampled yielded an Aggressive Chemical Environment Class (ACEC) of AC-2. The results of the water soluble sulphate content and pH testing carried out on the samples of the made ground showed the materials to fall into Class DS-2.

10.7.2 In addition, the results of the water soluble sulphate content and pH testing carried out on the samples of the natural ground yield an Aggressive Chemical Environment Class (ACEC) of AC-2 requiring Design Sulphate Class DS-2.

10.7.3 Consequently, following the recommendations of BRE SD1:2005, it is recommended that a Design Sulphate Class of DS-2 is utilised.

11 CONCLUSIONS & RECOMMENDATIONS

11.1 Conclusions

11.1.1 Tweedie Evans Consulting Ltd (TEC) has been appointed by Berkeley Homes (East Thames) Limited to undertake a preliminary geoenvironmental and geotechnical assessment of Royal Arsenal Riverside − Phase 18-19. All works were undertaken in accordance with our proposal letter dated 11 February 2016 and referenced 1508005.003.bidlet.

11.1.2 The site is situated off Warren Lane and Beresford Lane within the Royal Arsenal River development in Woolwich. The centre of the site is situated at approximate National Grid Reference 543640, 179130 and covers an area of approximately 1.5 hectares. The nearest postcode is SE18 6BJ.

11.1.3 The site currently comprises an irregular shaped parcel of land. The southern section of the site is currently utilised by sub-contractors for the ongoing works for the Royal Arsenal Riverside development. The central section of the site is currently utilised by Berkeley Homes as project offices and welfare facilities. Pedestrian access into the site is via a set of gates within this area. A brick building known as the Catholic Club is also present within this area.

11.1.4 The northern section of the site currently comprises an area used for car parking. In addition part of a proposed hotel structure is present along the north-west boundary of the site.

11.1.5 The proposed development is understood to comprise the construction of two residential structures up to twelve stories in height with associated hard infrastructure and communal soft landscaping.

11.1.6 The site is reportedly underlain by superficial Head deposits, which have been classified by the Environment Agency as a Secondary (undifferentiated) Aquifer. This is turn is reportedly underlain by the Thanet Sand Formation and Upper Chalk, which have been classified as a Secondary A Aquifer and Principal Aquifer respectively, by the Environment Agency.

11.1.7 The environmental sensitivity of the site is considered to be low to moderate, due primarily to the presence of the underlying Secondary and Principal Aquifers and the close proximity of the River Thames.

11.1.8 Intrusive works undertaken on the site recorded made ground to a maximum observed depth of 2.8mbgl. However, although no exceedances of the Tier 1 SSVs for a residential site end use were recorded within representative made ground samples from site,, works undertaken by Subadra (2007) reported elevated concentrations of TPH within samples collected from the sides and base of excavations following the removal of these tanks. Comparison of these recorded concentrations with the current SSVs considered appropriate for the site reported a number of exceedances for the lower banded TPH (i.e. C8 − C12). Furthermore, asbestos fibre have been reported during the current works.

11.1.9 Ground Gas Monitoring undertaken as part of the current investigation recorded a maximum Gas Screening Value of 0.0504l/hr, indicating the site is likely to be characterised as Characteristic Situation 1.

11.1.10 Potential contaminant sources have been identified on site, these include:

- Made ground materials – asbestos fibres were recorded within made ground materials.

- Made ground materials – elevated TPH concentrations were recorded within samples recovered from former tanks assumed to be associated with the former garage within the northern section the site

11.1.11 Based upon our current conceptual understanding of the site and the proposed end use, the main potential Significant Pollutant Linkages identified are considered to be:

- Human health (including construction workers and future site end users) – exposure to asbestos fibres through the inhalation pathway

- Controlled Waters – potential leaching of TPH recorded within samples collected by Subadra (2007) associated with the former garage onsite.

- Human Health and Proposed Structures – exposure to potential vapours associated with recorded TPH concentrations by Subadra (2007) associated with the former garage within the northern section of the site.

11.2 Geoenvironmental Risk Management Recommendations

Identification of Feasible Remediation Options

11.2.1 Significant risks identified within the conceptual model can be mitigated through the breaking of the significant pollution linkage by the removal of at least the source, receptor or pathway. Within reference to the site's conceptual models the following preliminary remediation approach has been prepared. This preliminary remediation approach may need to be presented in more detail within a Remediation Strategy, the content of which may require agreement in writing of the Regulatory Authorities prior to commencing any remediation on site.

Human Health

11.2.2 Where soft landscaping is proposed and where made ground remains after finished site levels have been achieved, exposure to potential contaminants cannot be discounted. Given the recorded presence of asbestos fibres within the made ground at the site, a suitable engineered cover system would be required in such areas where made ground remains after any site clearance works are completed.

11.2.3 The presence of hardstanding associated with the remaining site areas (i.e. building footprint, parking, access roads etc.) would also mitigate against the potential risks to site end users from the identified contamination within the made ground materials on site.

11.2.4 Given the presence of asbestos across the site, good brownfield practises should be adopted by construction workers to mitigate against the identified potential risks.

11.2.5 Should water supply pipes be placed within the made ground encountered at the site, due consideration would need to be given to the UK Water Industry Research Ltd (UKWIR) guidance.

11.2.6 At present, the former garage area situated within the northern section of the site has not been fully investigated due to the presence of existing structures, high voltage cables and construction works being undertaken within that area at the time of the investigation. As a result, further investigation of this area is recommended.

11.2.7 With regards to the southern section of the site, based on our conceptual understanding of the site to-date, it would be anticipated that similar ground conditions to those encountered as part of this assessment exist across the site area. However, should significant thicknesses of made ground be encountered, or visual or olfactory evidence of potentially significant contamination be identified during the development works, further investigation and assessment may be required, particularly within the areas of the site, which at present have not been investigated.

Controlled Waters

11.2.8 Given the absence of gross contamination within the shallow made ground and the limited groundwater encountered, the risk to controlled waters is considered to be low.

11.2.9 Notwithstanding this, given the elevated TPH concentrations recorded by Subadra (2007) within the northern section of the site associated with the former garage, the potential risk to controlled waters cannot be discounted and therefore, additional assessment is recommended.

Additional Assessment

11.2.10 At present, it cannot be discounted that residual contamination associated with previous industrial processes located on and in proximity of the site within the areas not currently investigated due to access restrictions may exist. Therefore, additional testing and assessment may be required to confirm the presence or absence of contaminants within these locations.

Gas

11.2.11 Based on the encountered ground conditions and the monitoring undertaken to date, a CS1 characterisation is considered appropriate for the site in accordance with current guidance.

11.2.12 The site is not reported to be located within a radon affected area as less than 1% of homes are reported to be above the Action Level. Therefore, no radon protection measures are required during the construction of new dwellings.

11.3 Ground Engineering

K1 Development

11.3.1 On the basis of field observation, ground conditions encountered onsite and the potential loads associated with the proposed K1 building, it is considered that a piled foundation would be the most appropriate solution due to the potentially high loads imposed by the proposed structures, founding within the underlying Thanet Sand Formation.

Pile Design

11.3.2 Based on the available site data, including that of previous investigations, it is recommended that a Characteristic friction value (φ′) of 37.5° would be appropriate for design within the Thanet Formation.

11.3.3 It is suggested that moderately conservative design parameters of $c' = 20kN/m^2$ and φ′ = 39° and worst credible parameters of c′ = 0 and φ′ = 34° would be appropriate in the Chalk.

11.3.4 CIRIA Report C574 recommends that the following empirical relationship should be adopted for estimating the ultimate average shaft resistance, T_{sf}, of bored piles in medium density chalk.

$$Tsf = 0.8 \times \sigma_v'$$

where σ_v' is the average effective stress resulting from the overlying chalk.

11.3.5 Further, for CFA piles the CIRIA report recommends the ultimate average shaft resistance should be estimated from

$$Tsf = 0.45 \times \sigma_v'$$

where σ_v' is the average effective stress resulting from the overlying chalk.

11.3.6 However, the CIRIA report indicates this relationship to be proven where the ultimate average shaft resistance, T_{sf}, is below 110kN/m^2 and the average effective stress, σ_v', is below 200kN/m^2.

11.3.7 CIRIA Report C574 recognises that SPT 'N' value is an imprecise method of measuring the strength of chalk at the base of a pile. However, it also indicates that until a better, more economical method has been found, it is likely to persist. The report recommends that, subject to the limitation of the crushing strength of concrete, the following ultimate base stresses be adopted:

Bored piles - ultimate base stress, qu = 200 x 'N' kN/m^2

CFA piles - ultimate base stress, qu = 200 x 'N' kN/m^2

Ground Floor Slabs

11.3.8 As a result of the structure being piled, the use of suspended floors are considered appropriate with Building K1. Given the non plastic nature of the Kempton Park Gravel it is suggested that a minimum void of 50mm should be utilised where suspended in situ concrete flooring is incorporated into the design. Where pre-cast concrete suspended floors are used a minimum void space of 200mm should be utilised to allow for 150mm of ventilation.

Excavations

11.3.9 Excavation of the materials immediately beneath the site should be achievable using conventional excavation plant.

11.3.10 It is understood that previous works (REC) for the adjacent Phase 3 site have established that the groundwater levels are tidally influenced. Based on the monitoring data to-date, groundwater levels for the general site area have been recorded at approximate depths of between 6.5mbgl and 7.0mbgl. However, groundwater monitoring undertaken as part of the current investigation on site recorded groundwater levels between 10.15mbgl and 10.54mbgl.

11.3.11 Based on the observations made during the recent intrusive works, groundwater ingress is unlikely to be a significant issue during excavation works, therefore, significant dewatering works are unlikely to be required during excavation and formation works.

11.3.12 Consideration should be given to the utilisation of appropriate temporary works during any excavation works within the made ground recorded at the site.

Protection of Buried Concrete

11.3.13 In accordance with BRE Special Digest 1, the made ground sampled yielded an Aggressive Chemical Environment Class (ACEC) of AC-2. The results of the water soluble sulphate content and pH testing carried out on the samples of the made ground showed the materials to fall into Class DS-2.

11.3.14 In addition, the results of the water soluble sulphate content and pH testing carried out on the samples of the natural ground yield an Aggressive Chemical Environment Class (ACEC) of AC-2 requiring Design Sulphate Class DS-2.

11.3.15 Consequently, following the recommendations of BRE SD1:2005, it is recommended that a Design Sulphate Class of DS-2 is utilised.

Building K2 (Central section of the site)

11.3.16 Should the ground conditions within the development area of K2 be similar to those encountered during the investigative works undertaken for K1 it is considered likely that a piled foundation solution may be the most appropriate foundation solution given the potentially high loads imposed by the proposed 12 storey structure, founding within competent chalk deposits.

11.3.17 However, an intrusive investigation is recommended within the proposed development area to fully confirm underlying ground conditions and any potential engineering constraints that may be associated with the proposed development.

TWEEDIE EVANS CONSULTING LIMITED

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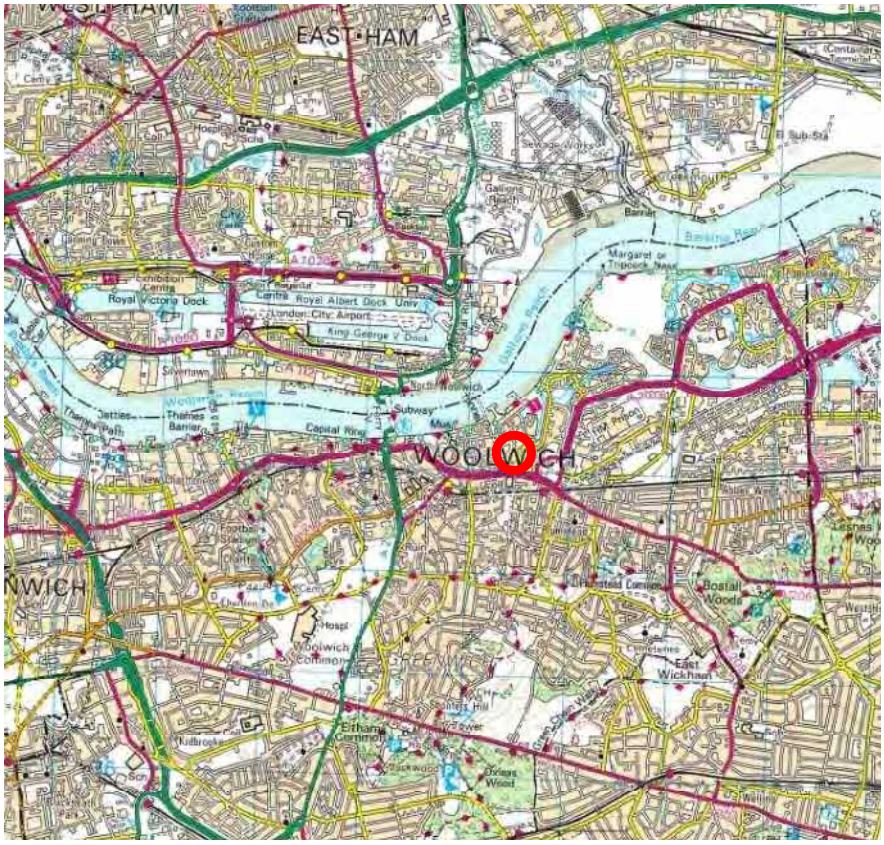
FIGURES



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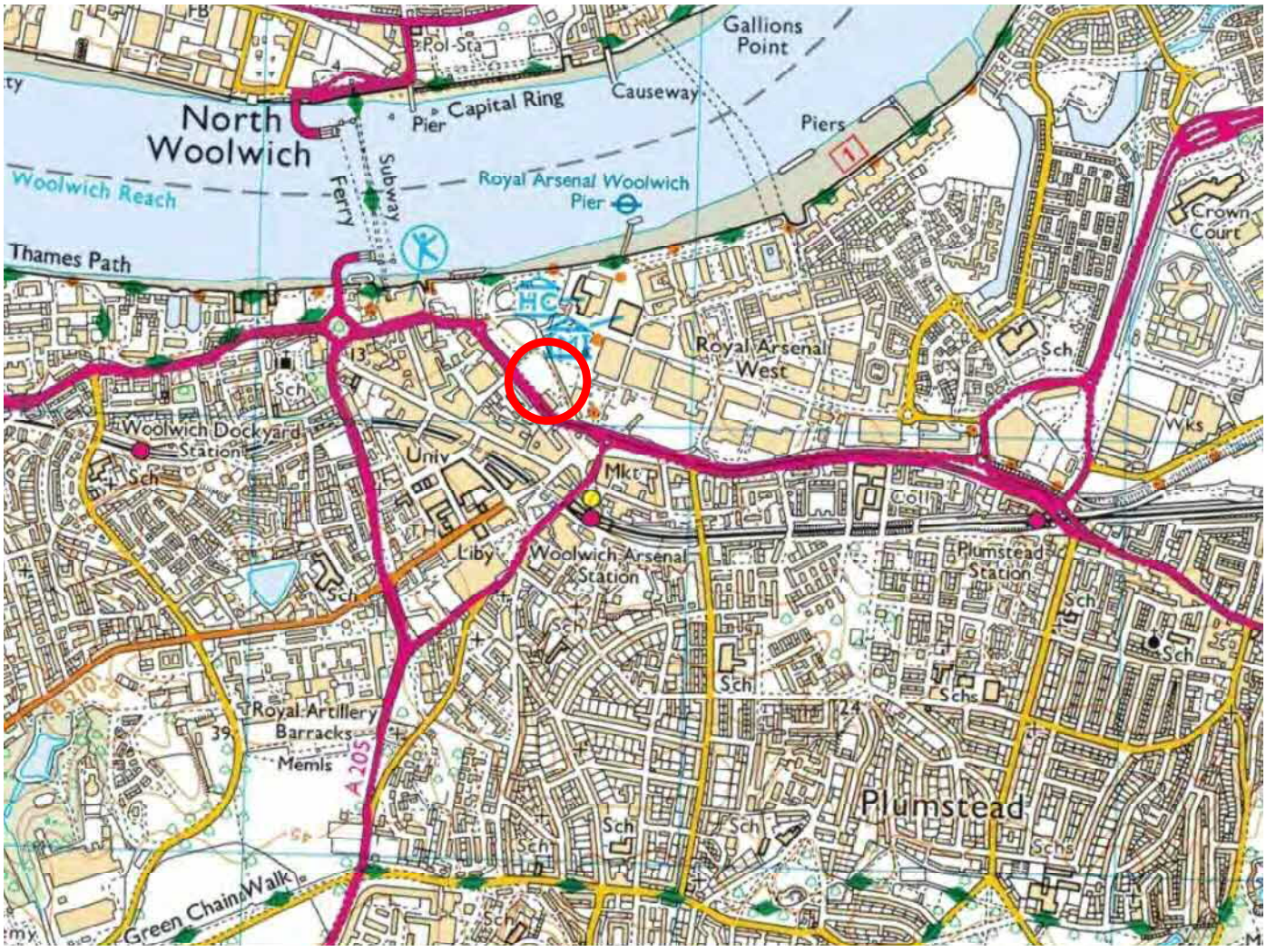

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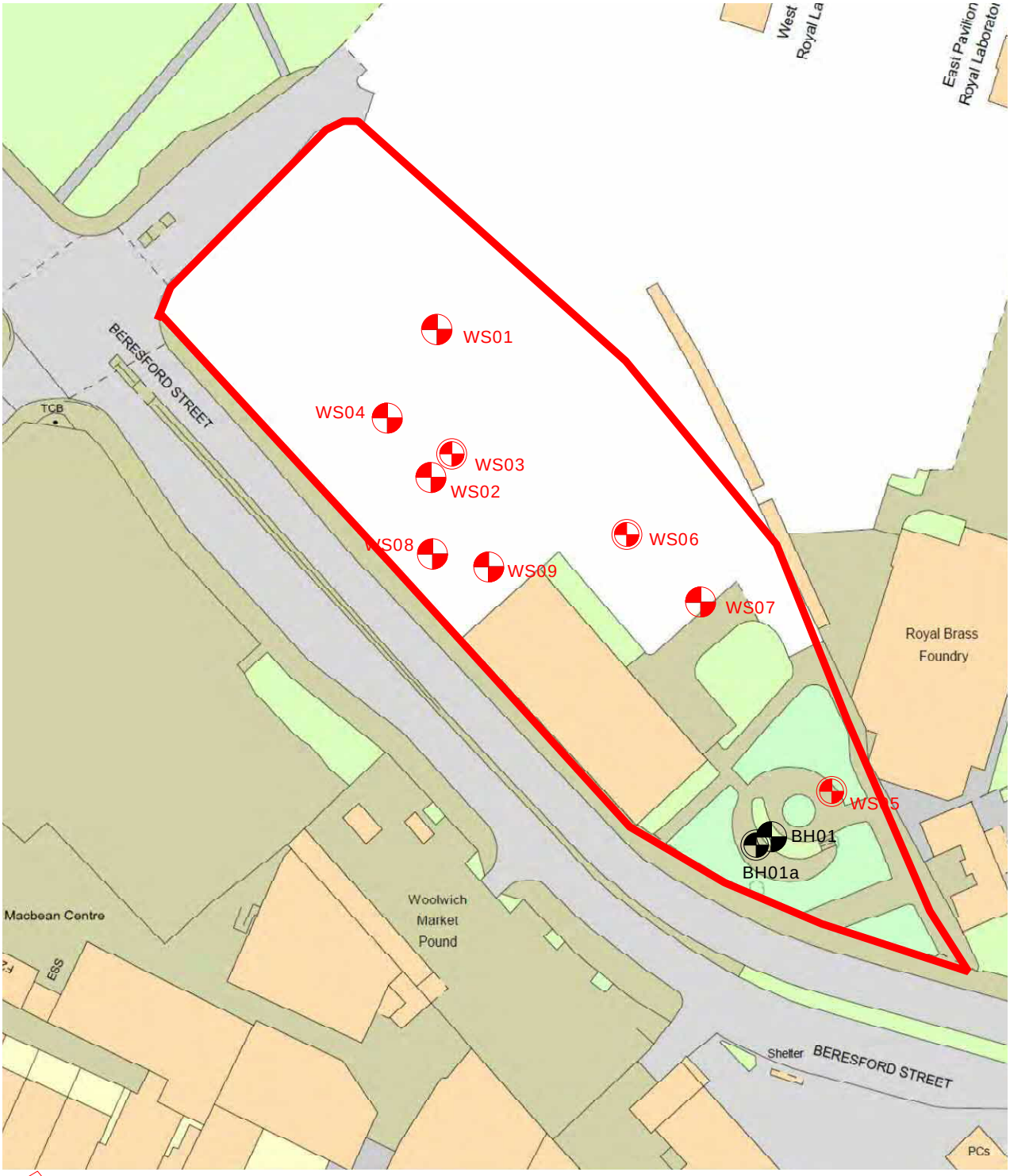
Drawing Name:		Berkeley Homes (East Thames) Limitec	Project No: 1508005.003	Date: May 2016 / Figure No:



Locations are approximate only.

: Approximate Site Boundary

: TEC Dynamic Sample Borehole Location

: TEC Cable Percussive Borehole Location:

: TEC Dynamic Sample Borehole with Installation Location:

: TEC Cable Percussive Borehole with Installation Location:

TEC TWEEDIE EVANS CONSULTING	Consulting … Somerset BA5 …	Email: info@tecon.co.uk www.tecon.co.uk	Site Name: Royal Arsenal Riverside Phases 18 - 19	Scale: NTS
Drawing Name: Exploratory Hole Location Plan	… Berkeley Homes (East Thames) Limited		Project No: 1508005.003	Date: May 2016	Figure No: …

APPENDIX A

Site Photographs

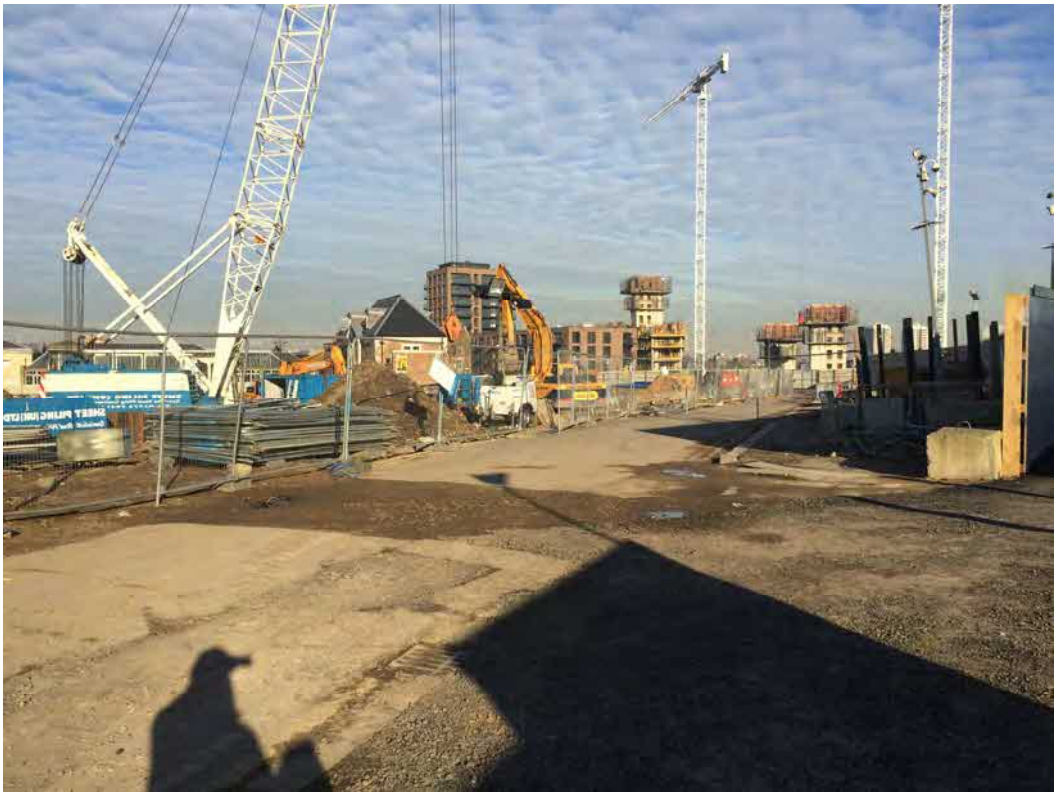
Photograph 1: View of south-eastern corner of the site within the contractors village. Facing south-east.

Photograph 2: View of far south-eastern section of the site.

Photograph 3: View of central section of the site facing south-east.

Photograph 4: View of central section of the site and Berkeley Project offices and welfare facilities. Facing north-west.

Photograph 5: View of northern boundary of the site and adjacent phase 3 site facing south-east.



Photograph 6: View of northern section of the site facing east.

Photograph 7: View of hotel section of the site facing north.

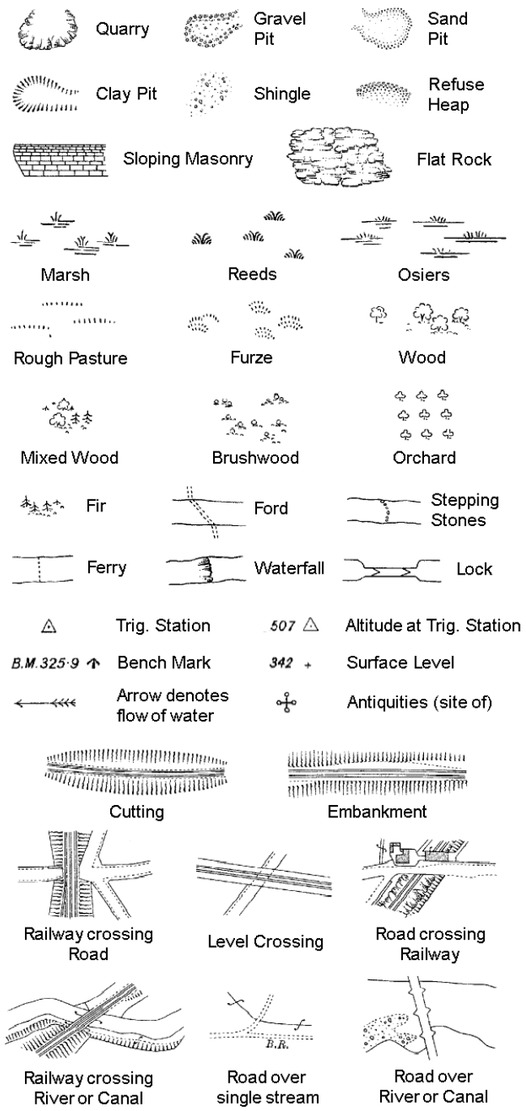
Photograph 8: View of hotel section of the site and site entrance facing north-west.

APPENDIX B

Historical Maps

Historical Mapping Legends

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



County Boundary (Geographical)

County & Civil Parish Boundary

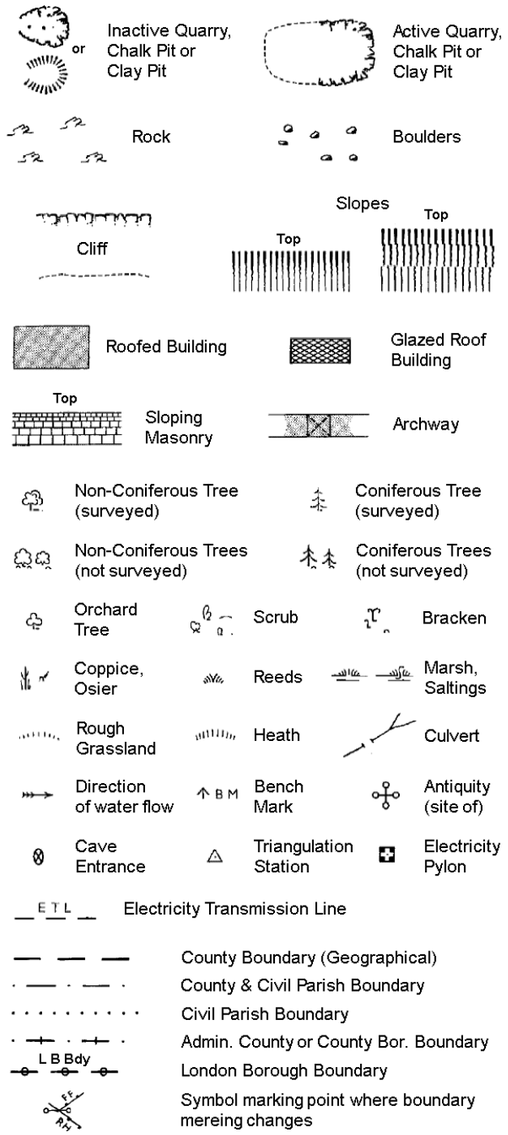
Administrative County & Civil Parish Boundary

Co. Boro. Bdy. County Borough Boundary (England)

Co. Burgh Bdy. County Burgh Boundary (Scotland)

B P B S	Boundary Post or Stone	P.C.B	Police Call Box
B.R.	Bridle Road	P	Pump
E.P	Electricity Pylon	S.P	Signal Post
F.B.	Foot Bridge	Sl.	Sluice
F.P.	Foot Path	Sp.	Spring
G.P	Guide Post or Board	T.C.B	Telephone Call Box
M.S	Mile Stone	Tr.	Trough
M.P M.R	Mooring Post or Ring	W	Well

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



County Boundary (Geographical)

County & Civil Parish Boundary

Civil Parish Boundary

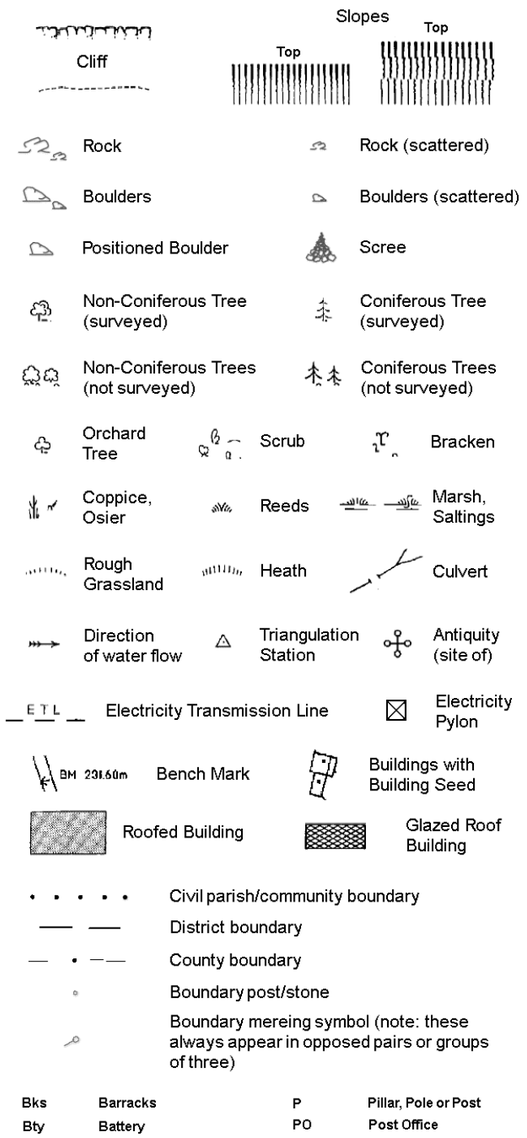
Admin. County or County Bor. Boundary

L B Bdy London Borough Boundary

Symbol marking point where boundary mereing changes

BH	Beer House	P	Pillar, Pole or Post
BP, BS	Boundary Post or Stone	PO	Post Office
Cn, C	Capstan, Crane	PC	Public Convenience
Chy	Chimney	PH	Public House
D Fn	Drinking Fountain	Pp	Pump
El P	Electricity Pillar or Post	SB, S Br	Signal Box or Bridge
FAP	Fire Alarm Pillar	SP, SL	Signal Post or Light
FB	Foot Bridge	Spr	Spring
GP	Guide Post	Tk	Tank or Track
H	Hydrant or Hydraulic	TCB	Telephone Call Box
LC	Level Crossing	TCP	Telephone Call Post
MH	Manhole	Tr	Trough
MP	Mile Post or Mooring Post	Wr Pt, Wr T	Water Point, Water Tap
MS	Mile Stone	W	Well
NTL	Normal Tidal Limit	Wd Pp	Wind Pump

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



Civil parish/community boundary

District boundary

County boundary

Boundary post/stone

Boundary mereing symbol (note: these always appear in opposed pairs or groups of three)

Bks	Barracks	P	Pillar, Pole or Post
Bty	Battery	PO	Post Office
Cemy	Cemetery	PC	Public Convenience
Chy	Chimney	Pp	Pump
Cis	Cistern	Ppg Sta	Pumping Station
Dismtd Rly	Dismantled Railway	PW	Place of Worship
El Gen Sta	Electricity Generating Station	Sewage Ppg Sta	Sewage Pumping Station
El P	Electricity Pole, Pillar	SB, S Br	Signal Box or Bridge
El Sub Sta	Electricity Sub Station	SP, SL	Signal Post or Light
FB	Filter Bed	Spr	Spring
Fn / D Fn	Fountain / Drinking Ftn.	Tk	Tank or Track
Gas Gov	Gas Valve Compound	Tr	Trough
GVC	Gas Governer	Wd Pp	Wind Pump
GP	Guide Post	Wr Pt, Wr T	Water Point, Water Tap
MH	Manhole	Wks	Works (building or area)
MP, MS	Mile Post or Mile Stone	W	Well

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Historical Mapping & Photography included:

Mapping Type	Scale	Date	Pg
Essex	1:2,500	1864	2
London	1:2,500	1869	3
Kent	1:2,500	1895	4
London	1:2,500	1896	5
London	1:2,500	1916	6
Essex	1:2,500	1916	7
Ordnance Survey Plan	1:1,250	1957	8
Additional SIMs	1:1,250	1957 - 1988	9
Ordnance Survey Plan	1:2,500	1958	10
Ordnance Survey Plan	1:1,250	1970 - 1971	11
Additional SIMs	1:1,250	1977 - 1987	12
Additional SIMs	1:1,250	1986 - 1987	13
Ordnance Survey Plan	1:1,250	1988	14
Large-Scale National Grid Data	1:1,250	1991	15
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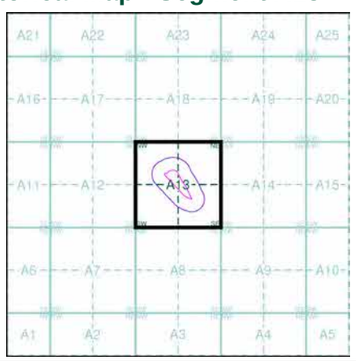
Large-Scale National Grid Data	1:1,250	1996	17

Historical Map - Segment A13



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Search Buffer (m):	100

Site Details

Phase 18-19, Warren Lane, LONDON

Landmark Information Group

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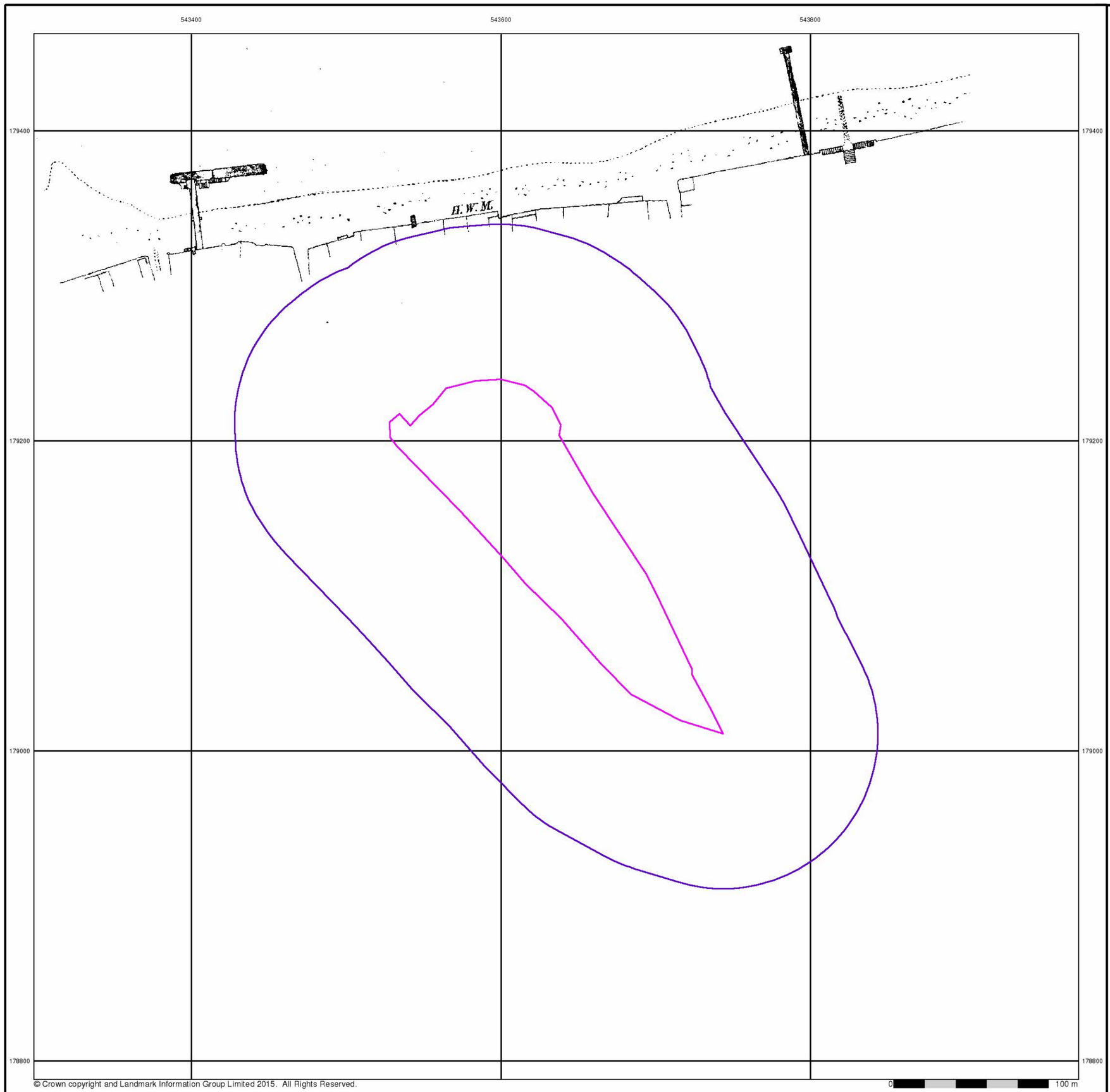
Web: www.envirocheck.co.uk



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Essex

Published 1864

Source map scale - 1:2,500

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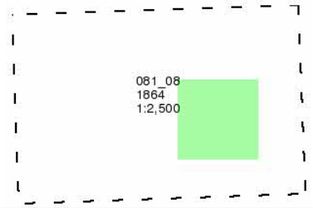

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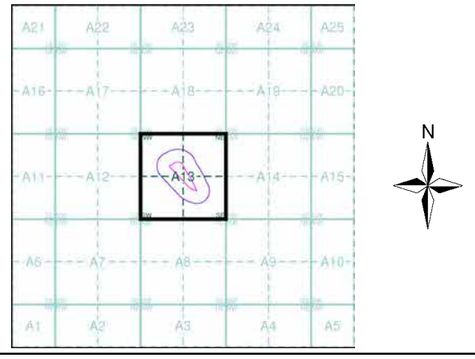

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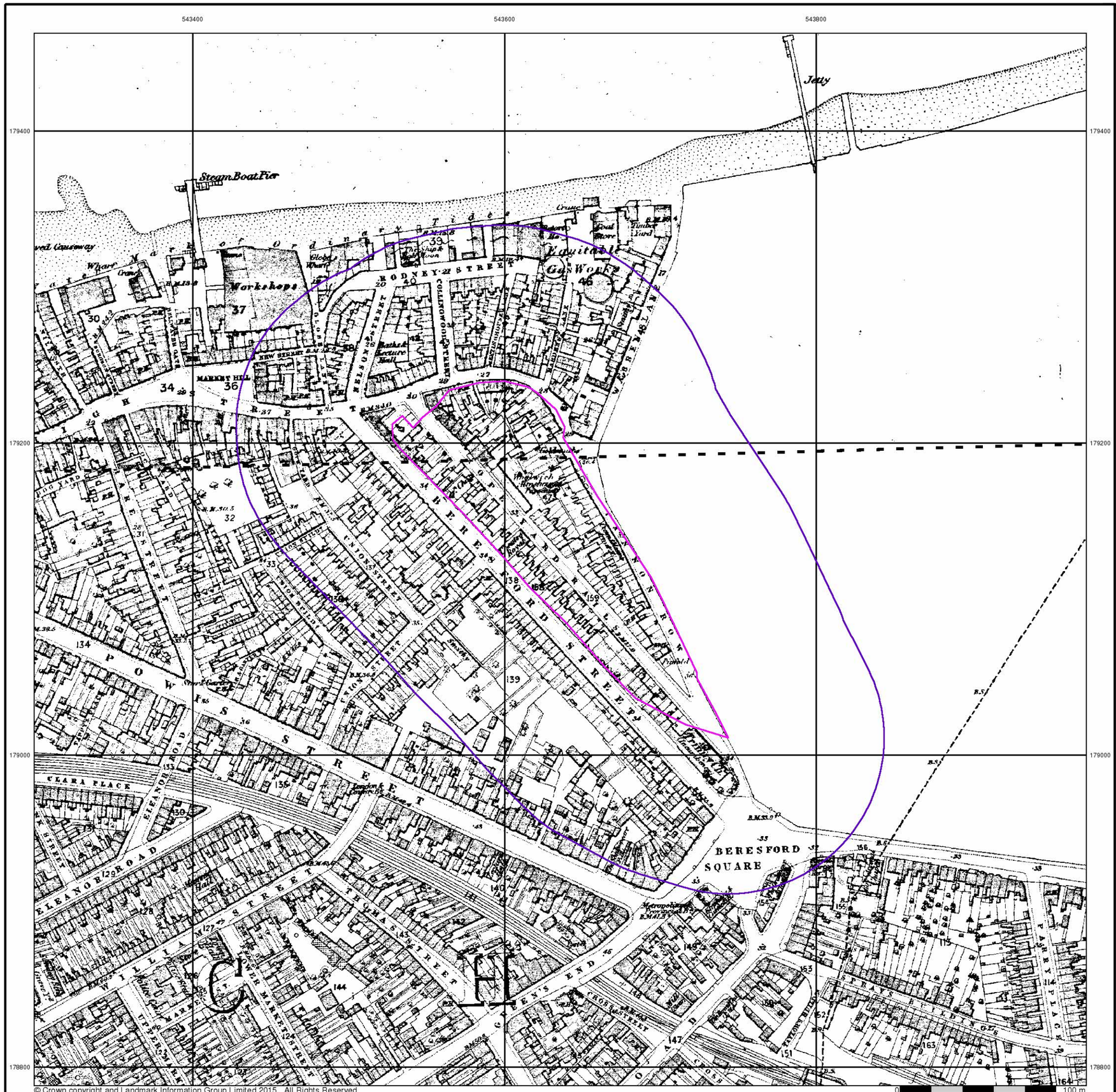

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London

Published 1869

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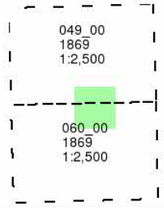

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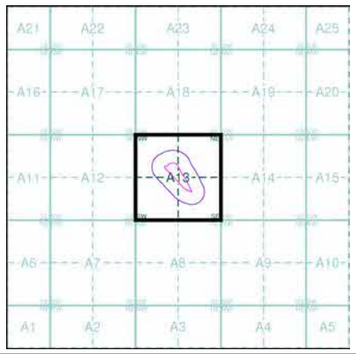

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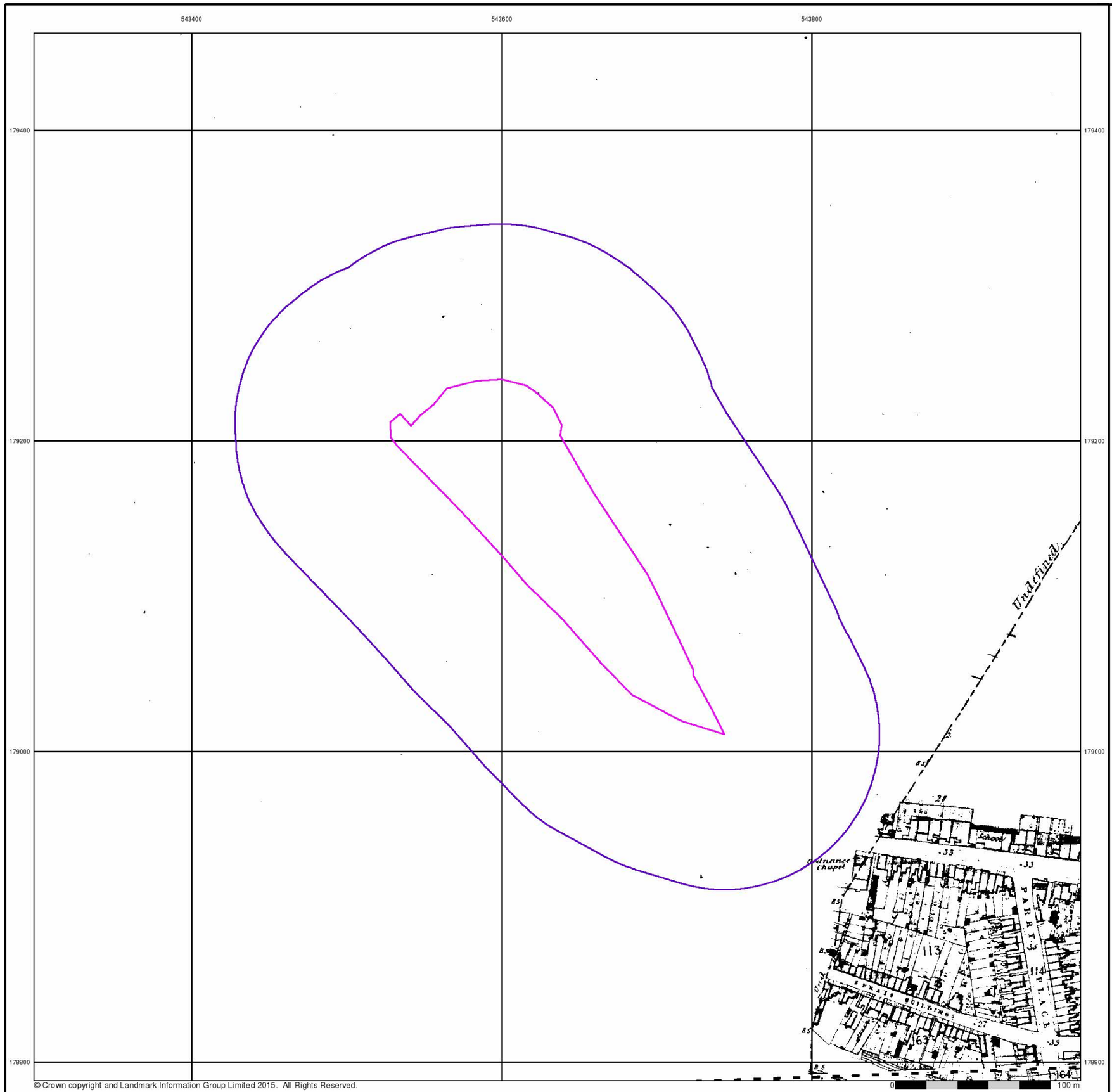

TWEEDIE EVANS CONSULTING

Kent

Published 1895

Source map scale - 1:2,500

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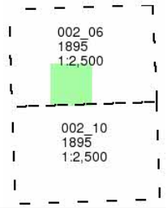

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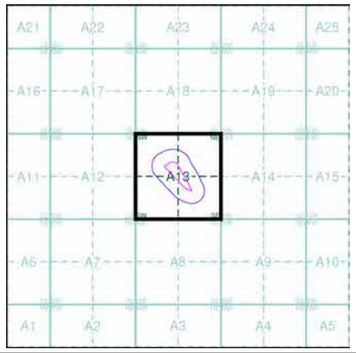

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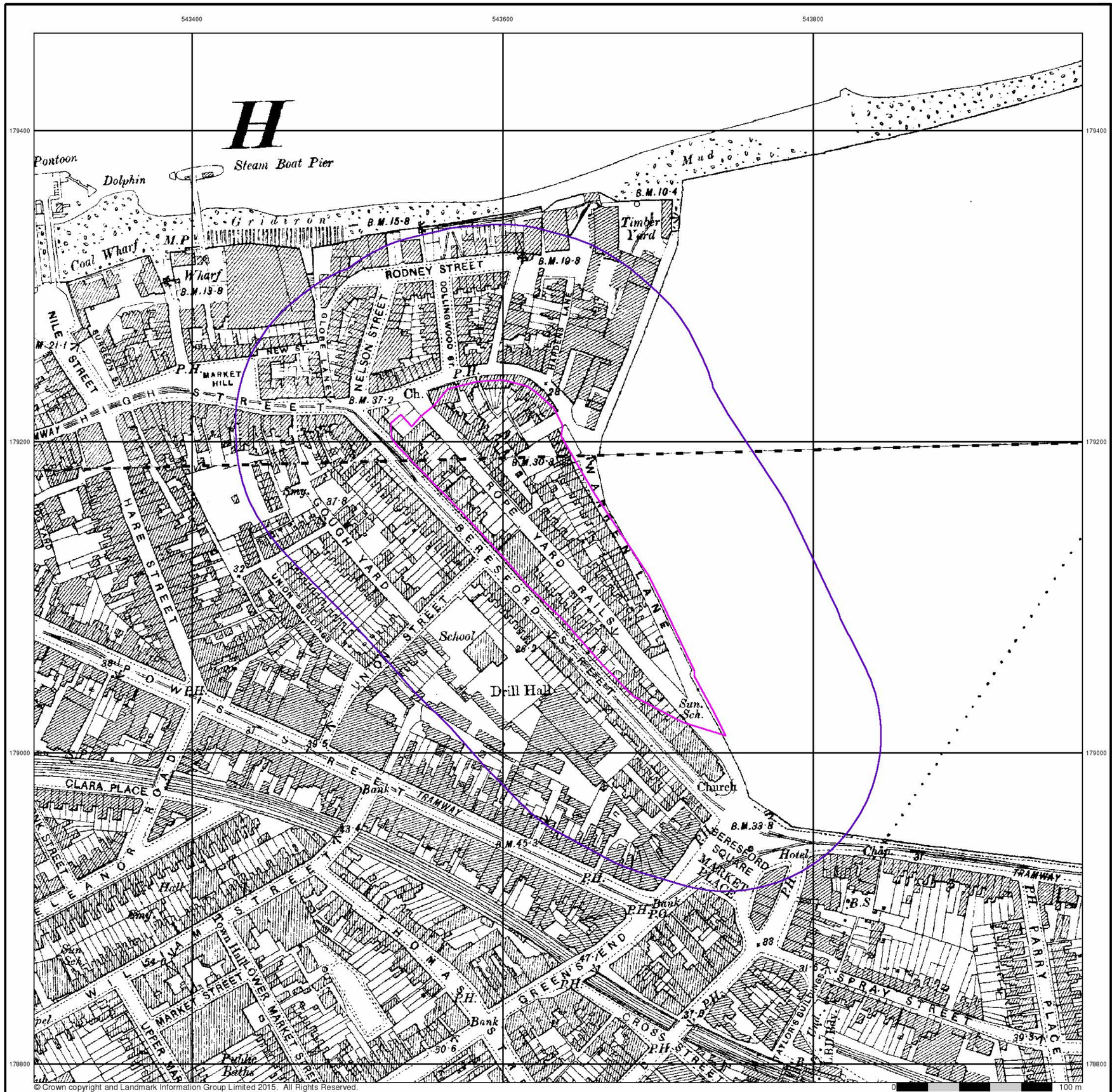

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London

Published 1896

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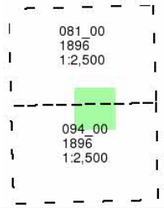

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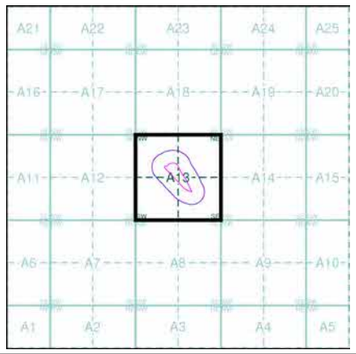

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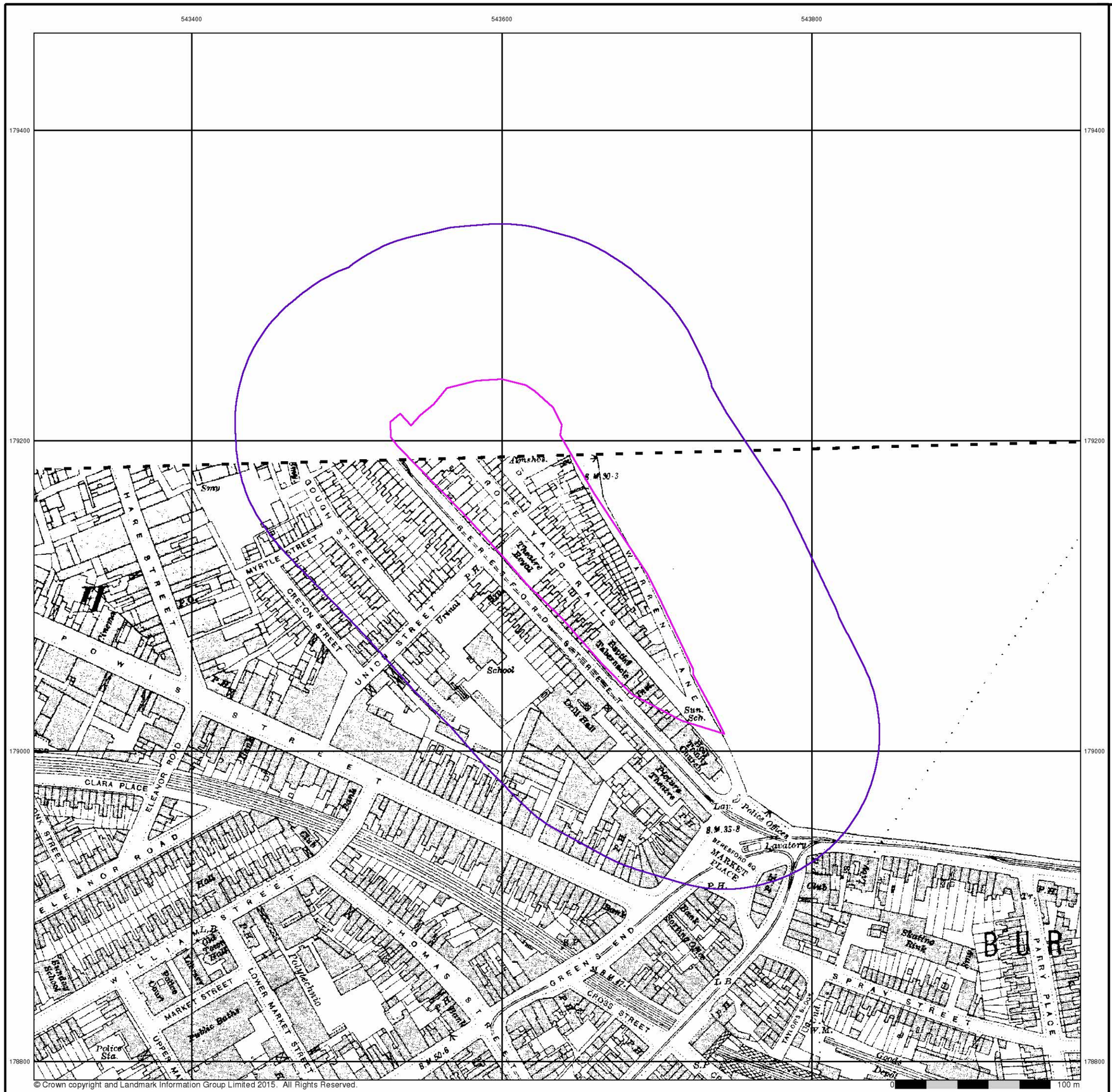

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London

Published 1916

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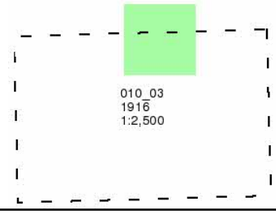

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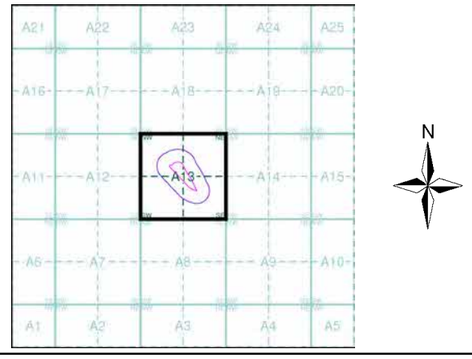

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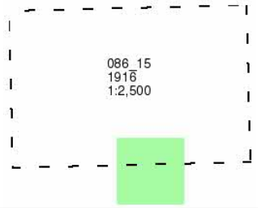
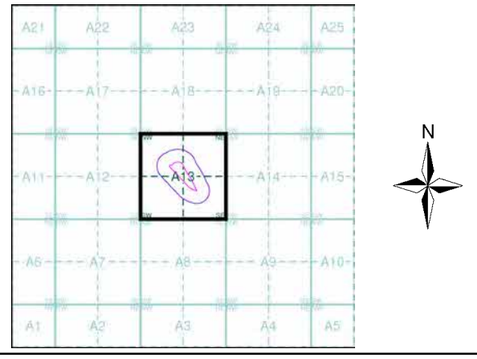
Map Name(s) and Date(s)



Historical Map - Segment A13



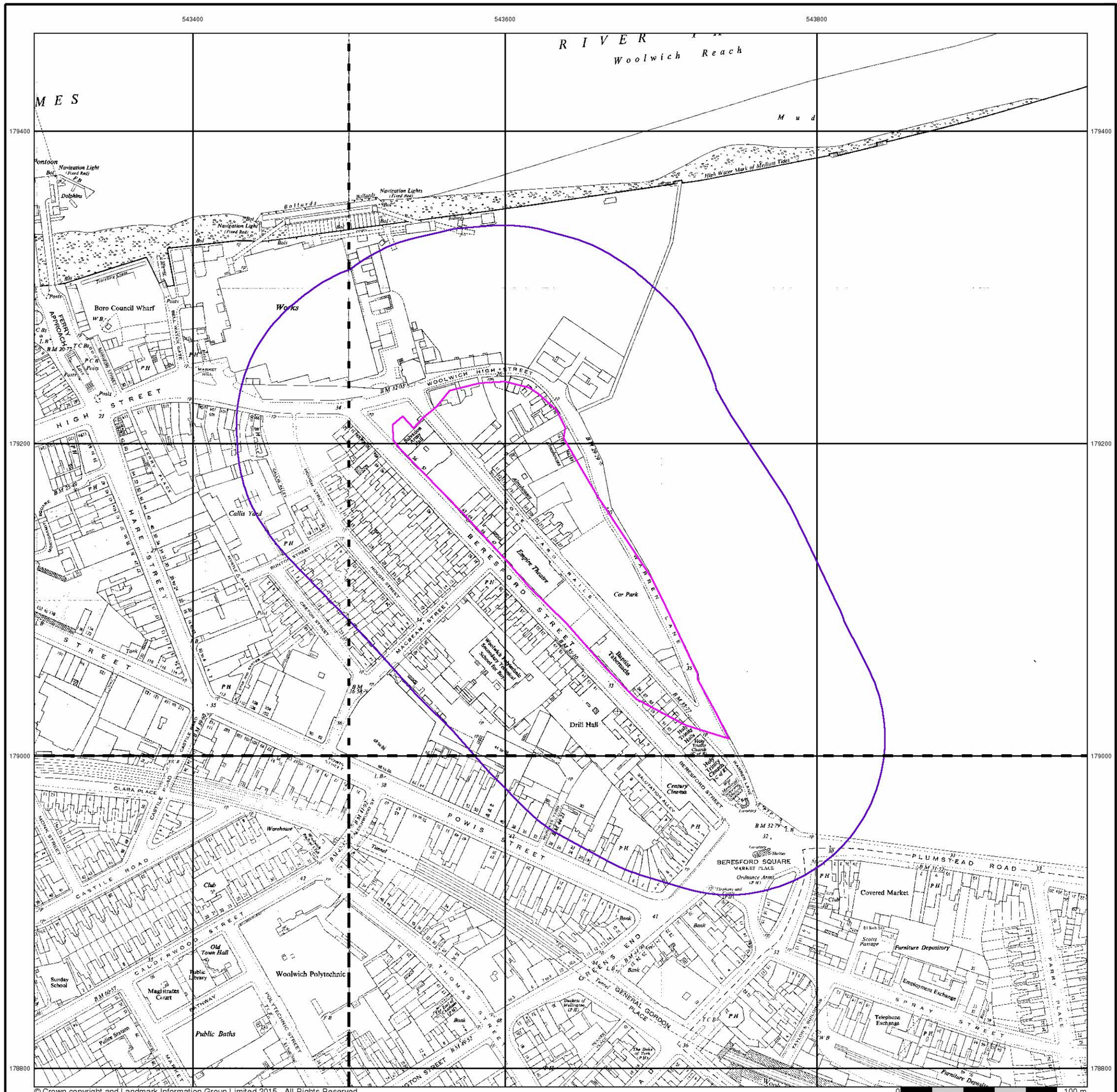
Order Details

Order Number:	83661986_1_1
Customer Ref:	1508005.003
National Grid Reference:	543640, 179130
Slice:	A
Site Area (Ha):	1.71
Search Buffer (m):	100

Site Details

Phase 18-19, Warren Lane, LONDON

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



TWEEDIE EVANS CONSULTING

Ordnance Survey Plan

Published 1957

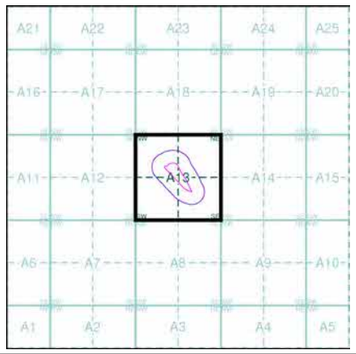
Source map scale - 1:1,250

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840`s. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

Map Name(s) and Date(s)

TQ4379SW 1957 1:1,250	TQ4379SE 1957 1:1,250
TQ4378NW 1957 1:1,250	TQ4378NE 1957 1:1,250

Historical Map - Segment A13



Order Details

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National Grid Reference:	543640, 179130
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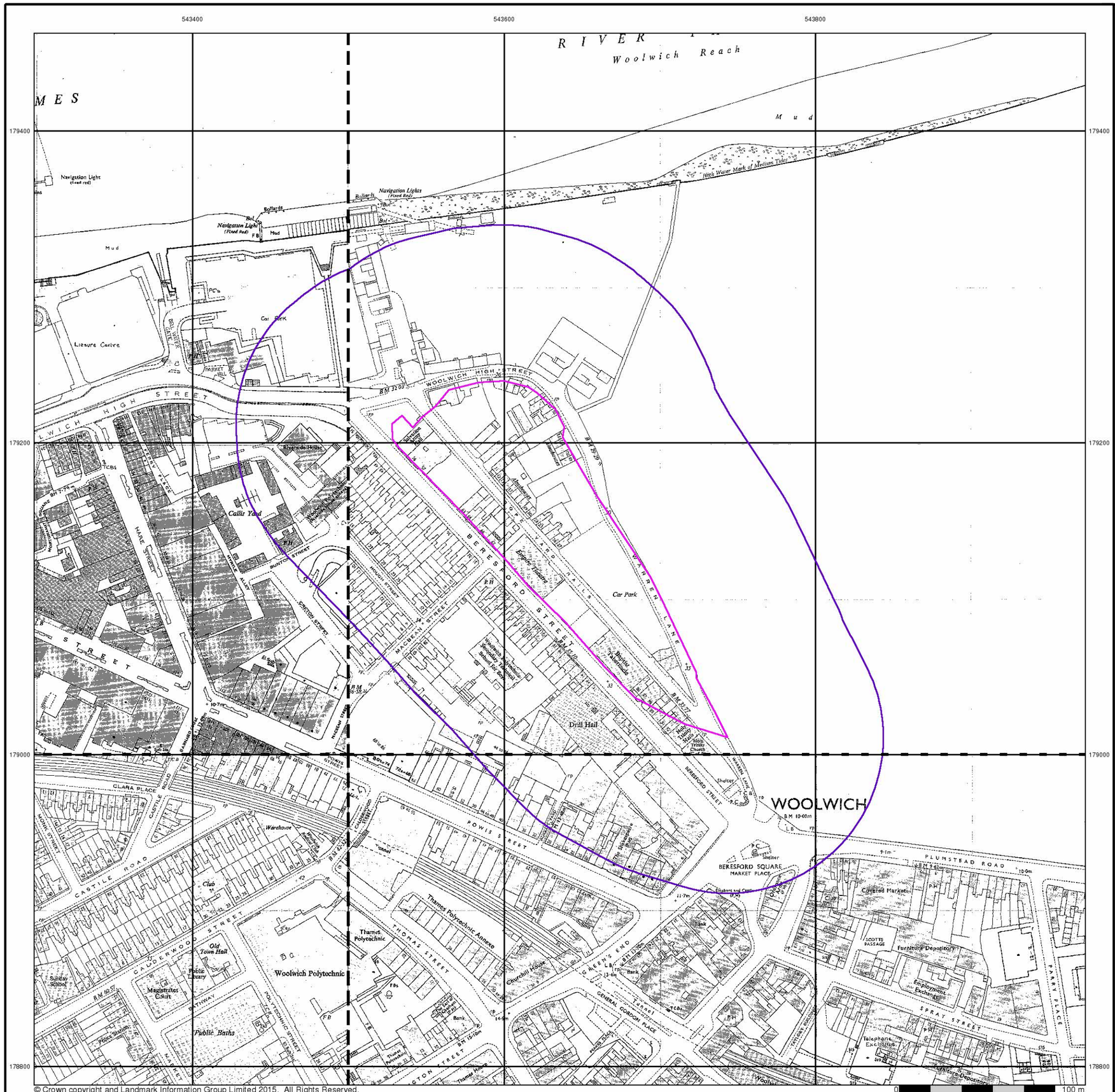
Search Buffer (m):	100

Site Details

Phase 18-19, Warren Lane, LONDON



TWEEDIE EVANS CONSULTING

Additional SIMs

Published 1957 - 1988

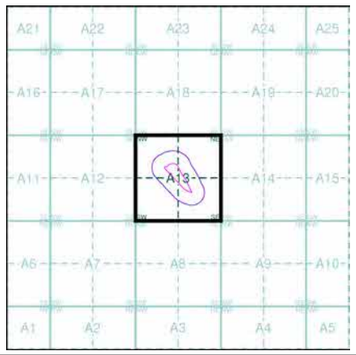
Source map scale - 1:1,250

The SIM cards (Ordnance Survey's `Survey of Information on Microfilm') are further, minor editions of mapping which were produced and published in between the main editions as an area was updated. They date from 1947 to 1994, and contain detailed information on buildings, roads and land-use. These maps were produced at both 1:2,500 and 1:1,250 scales.

Map Name(s) and Date(s)

TQ4379SW 1988 1:1,250	TQ4379SE 1957 1:1,250
TQ4378NW 1957 1:1,250	TQ4378NE 1977 1:1,250

Historical Map - Segment A13



Order Details

Order Number:	83661986_1_1
Customer Ref:	1508005.003
National Grid Reference:	543640, 179130
Slice:	A
Site Area (Ha):	1.71
Search Buffer (m):	100

Site Details

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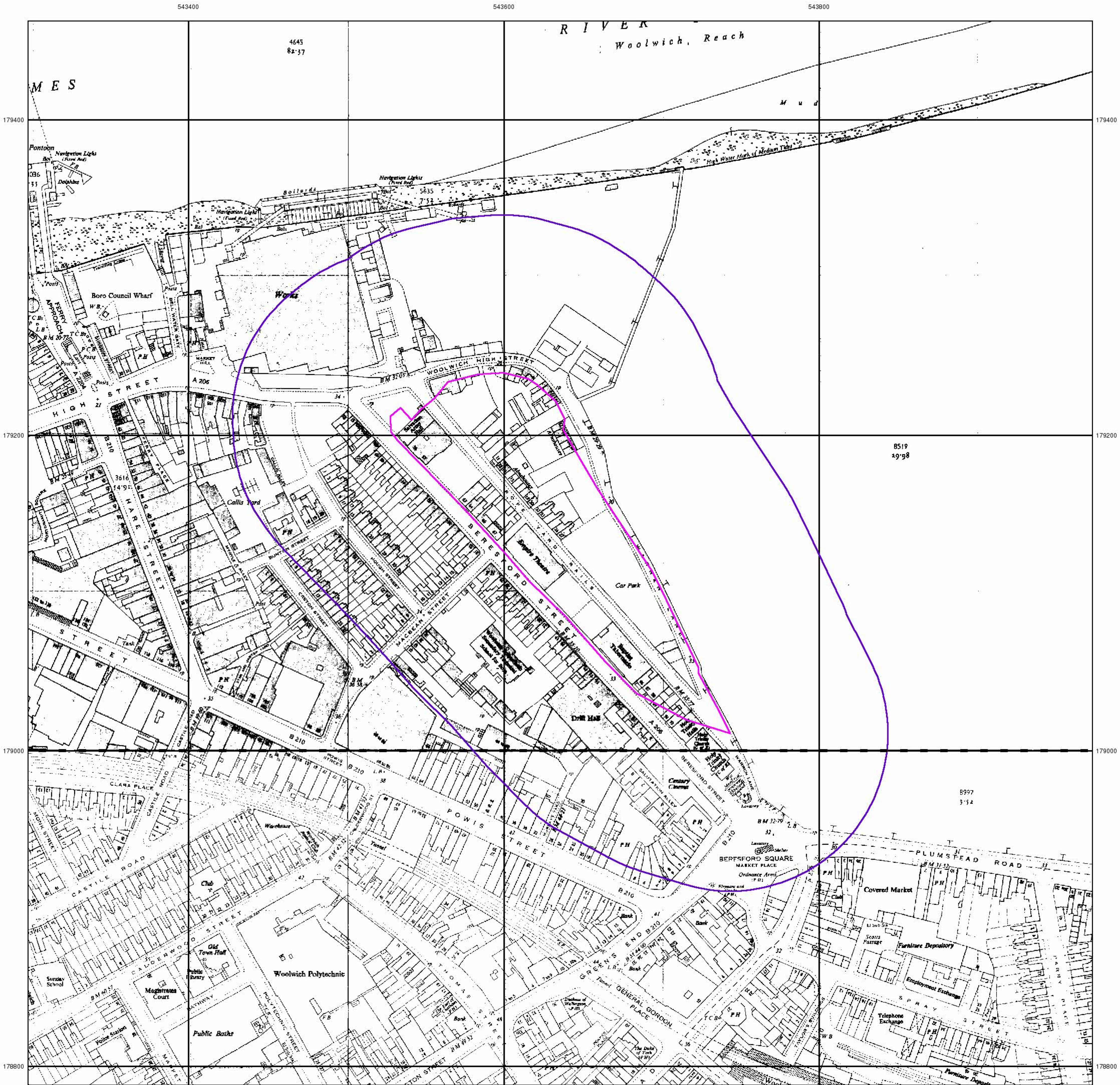


TWEEDIE EVANS CONSULTING

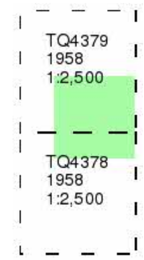
Ordnance Survey Plan

Published 1958

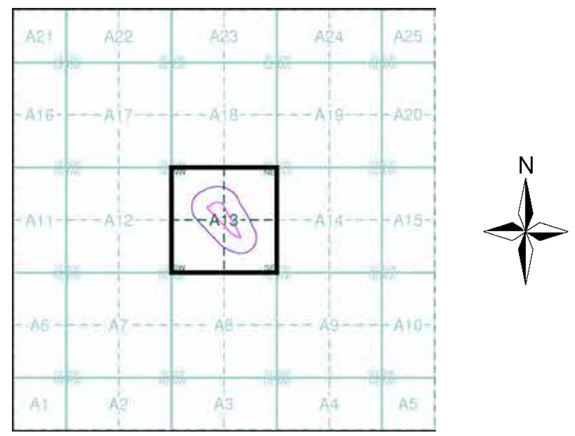
Source map scale - 1:2,500

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840`s. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

Map Name(s) and Date(s)



Historical Map - Segment A13



Order Details

Order Number: 83661986_1_1
Customer Ref: 1508005.003
National Grid Reference: 543640, 179130
Slice: A
Site Area (Ha): 1.71
Search Buffer (m): 100

Site Details

Phase 18-19, Warren Lane, LONDON

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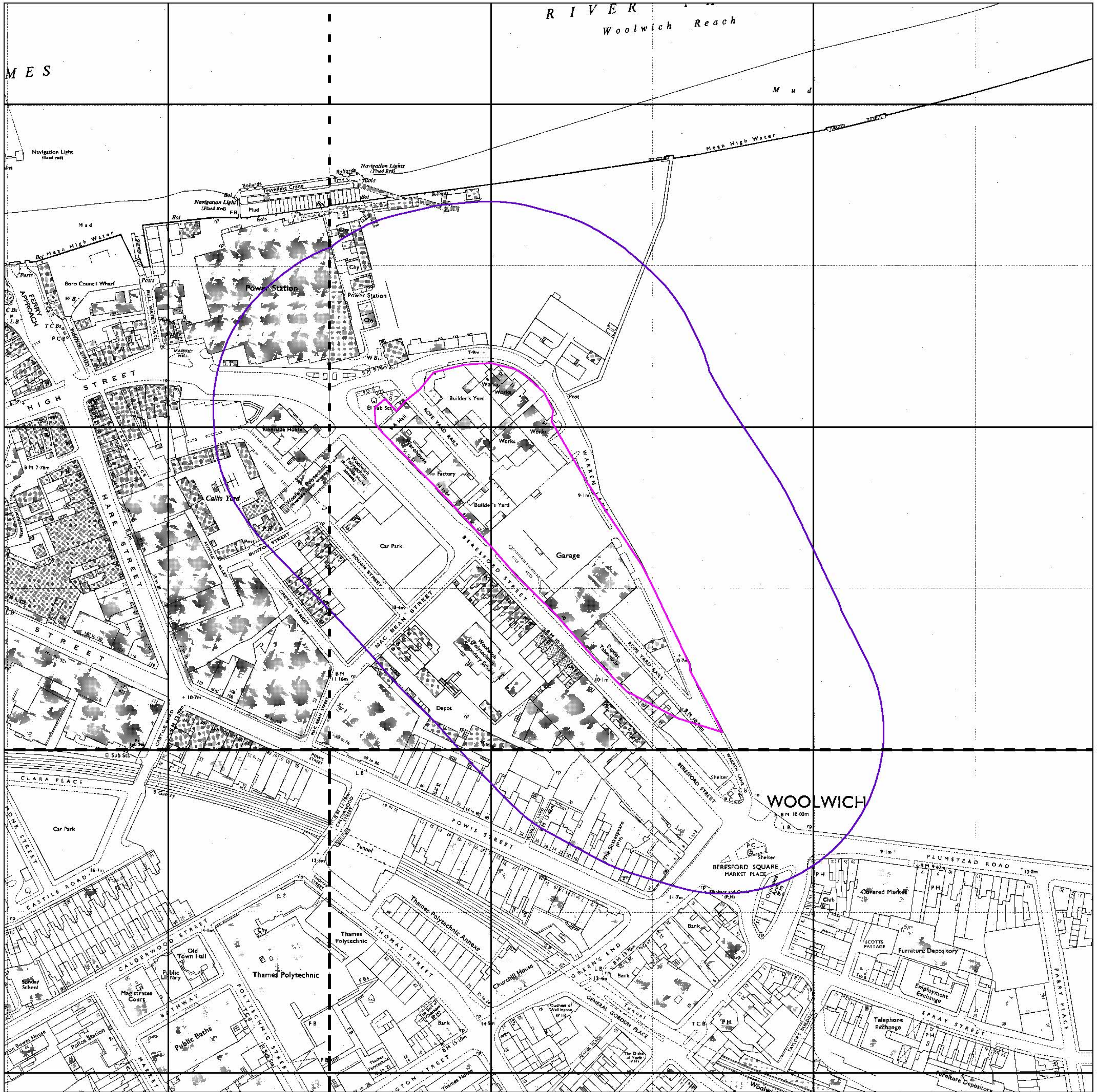


TWEEDIE EVANS CONSULTING

Ordnance Survey Plan

Published 1970 - 1971

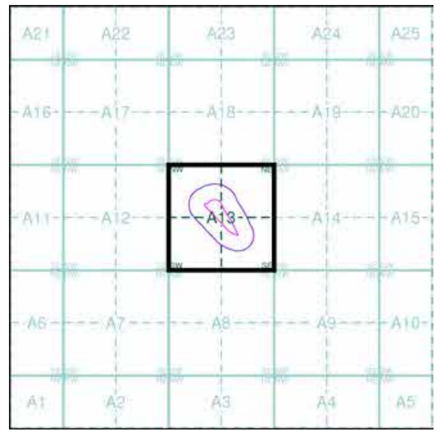
Source map scale - 1:1,250

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840`s. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

Map Name(s) and Date(s)

TQ4379SW 1970 1:1,250	TQ4379SE 1970 1:1,250
TQ4378NW 1971 1:1,250	TQ4378NE 1971 1:1,250

Historical Map - Segment A13



N

Order Details

Order Number: 83661986_1_1
Customer Ref: 1508005.003
National Grid Reference: 543640, 179130
Slice: A
Site Area (Ha): 1.71
Search Buffer (m): 100

Site Details

Phase 18-19, Warren Lane, LONDON

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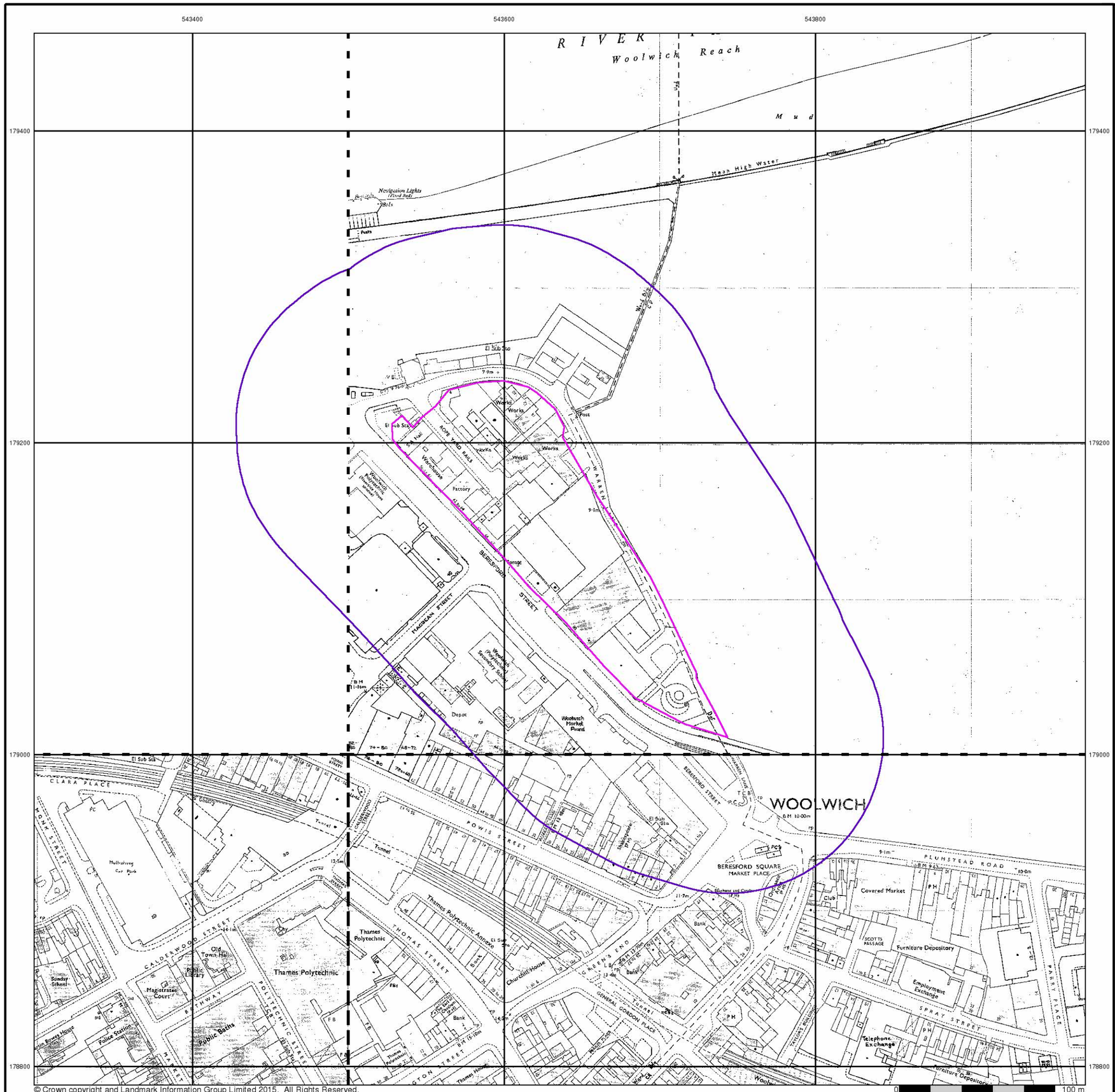


TWEEDIE EVANS CONSULTING

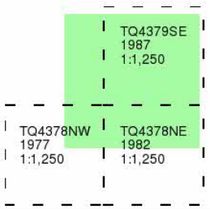
Additional SIMs

Published 1977 - 1987

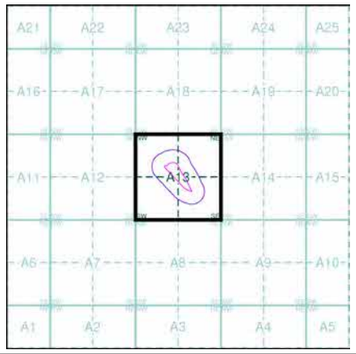
Source map scale - 1:1,250

The SIM cards (Ordnance Survey's `Survey of Information on Microfilm') are further, minor editions of mapping which were produced and published in between the main editions as an area was updated. They date from 1947 to 1994, and contain detailed information on buildings, roads and land-use. These maps were produced at both 1:2,500 and 1:1,250 scales.

Map Name(s) and Date(s)



Historical Map - Segment A13



Order Details

Order Number:	83661986_1_1
Customer Ref:	1508005.003
National Grid Reference:	543640, 179130
Slice:	A
Site Area (Ha):	1.71
Search Buffer (m):	100

Site Details

Phase 18-19, Warren Lane, LONDON

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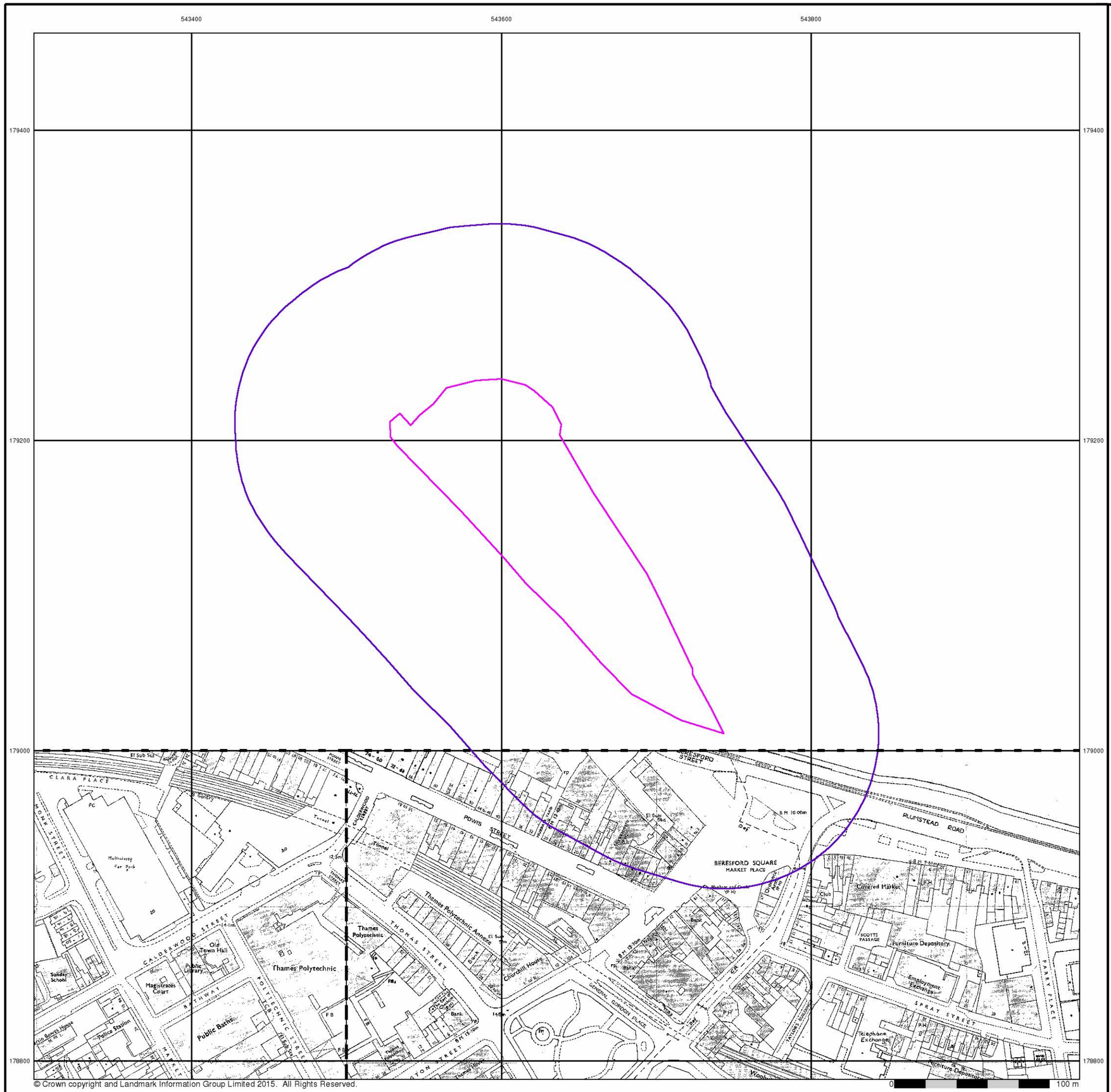


TWEEDIE EVANS CONSULTING

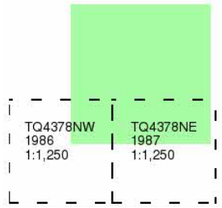
Additional SIMs

Published 1986 - 1987

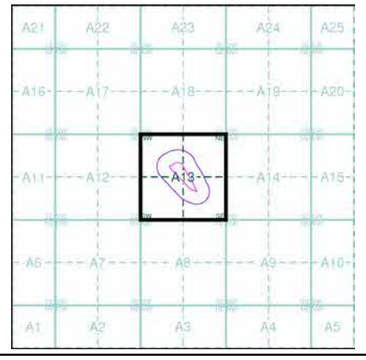
Source map scale - 1:1,250

The SIM cards (Ordnance Survey's `Survey of Information on Microfilm') are further, minor editions of mapping which were produced and published in between the main editions as an area was updated. They date from 1947 to 1994, and contain detailed information on buildings, roads and land-use. These maps were produced at both 1:2,500 and 1:1,250 scales.

Map Name(s) and Date(s)



Historical Map - Segment A13



Order Details

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National Grid Reference:	543640, 179130
Slice:	A
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Ordnance Survey Plan

Published 1988

Source map scale - 1:1,250

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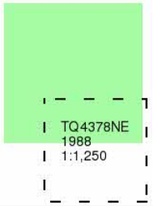
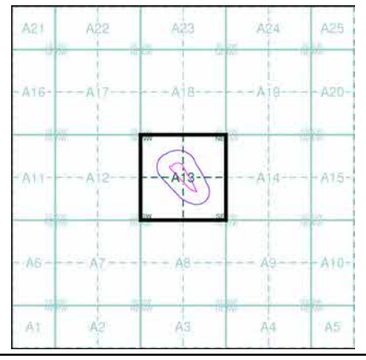
Map Name(s) and Date(s)



Historical Map - Segment A13



Order Details

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Customer Ref:	1508005.003
National Grid Reference:	543640, 179130
Slice:	A
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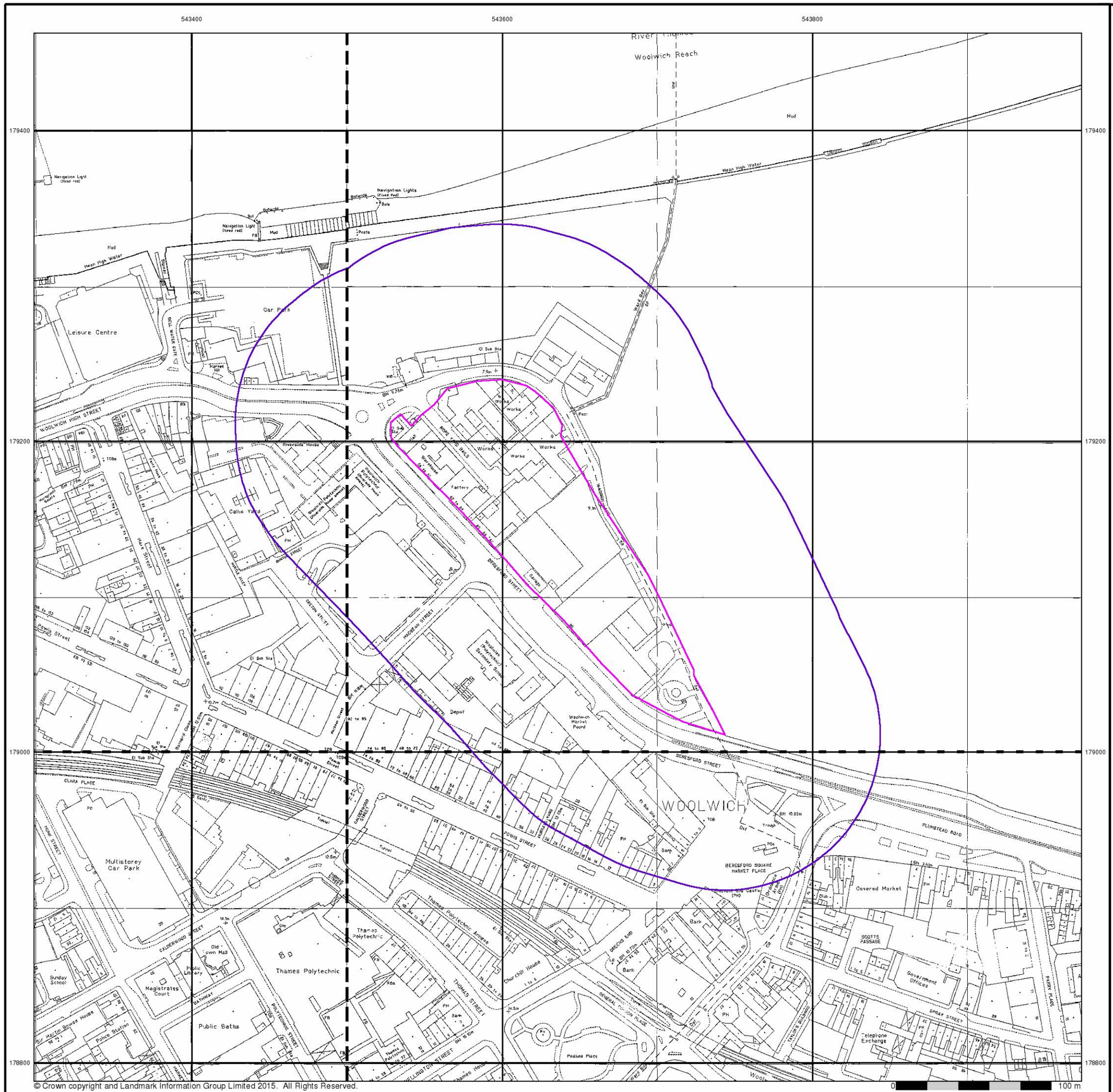


TWEEDIE EVANS CONSULTING

Large-Scale National Grid Data

Published 1991

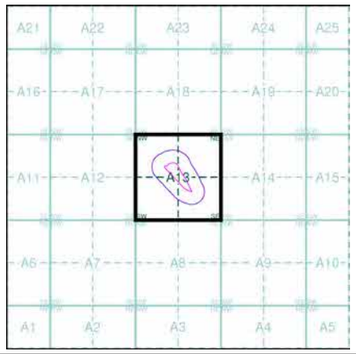
Source map scale - 1:1,250

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

Map Name(s) and Date(s)

TQ4379SW 1991 1:1,250	TQ4379SE 1991 1:1,250
TQ4378NW 1991 1:1,250	TQ4378NE 1991 1:1,250

Historical Map - Segment A13



Order Details

Order Number:	83661986_1_1
Customer Ref:	1508005.003
National Grid Reference:	543640, 179130
Slice:	A
Site Area (Ha):	1.71
Search Buffer (m):	100

Site Details

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TWEEDIE EVANS CONSULTING

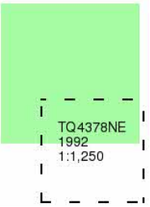
Large-Scale National Grid Data

Published 1992

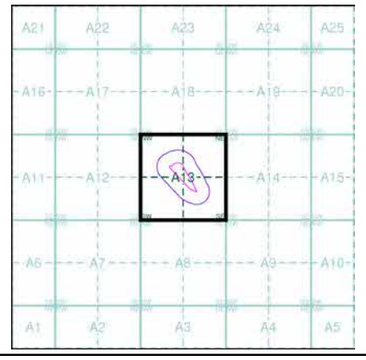
Source map scale - 1:1,250

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

Map Name(s) and Date(s)



Historical Map - Segment A13



Order Details

Order Number:	83661986_1_1
Customer Ref:	1508005.003
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TWEEDIE EVANS CONSULTING

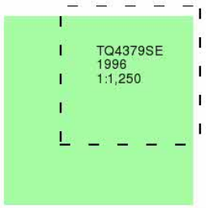
Large-Scale National Grid Data

Published 1996

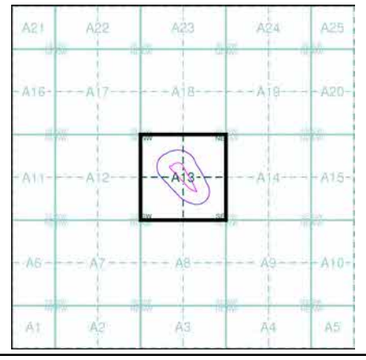
Source map scale - 1:1,250

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

Map Name(s) and Date(s)



Historical Map - Segment A13



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Historical Mapping Legends

Ordnance Survey County Series 1:10,560

Gravel Pit
Sand Pit
Other Pits
Quarry
Shingle
Orchard
Osiers
Reeds
Marsh
Mixed Wood
Deciduous
Brushwood
Fir
Furze
Rough Pasture
Arrow denotes flow of water
Trigonometrical Station
Site of Antiquities
Bench Mark
Pump, Guide Post, Signal Post
Well, Spring, Boundary Post
285 Surface Level
Sketched Contour
Instrumental Contour
Main Roads
Fenced
Un-Fenced
Minor Roads
Fenced
Un-Fenced
Sunken Road
Raised Road
Road over Railway
Railway over River
Railway over Road
Level Crossing
Road over River or Canal
Road over Stream
Road over Stream
County Boundary (Geographical)
County & Civil Parish Boundary
Administrative County & Civil Parish Boundary
Co. Boro. Bdy.
County Borough Boundary (England)
Co. Burgh Bdy.
County Burgh Boundary (Scotland)
R.D. Bdy.
Rural District Boundary
Civil Parish Boundary

Ordnance Survey Plan 1:10,000

Chalk Pit, Clay Pit or Quarry
Gravel Pit
Sand Pit
Disused Pit or Quarry
Refuse or Slag Heap
Lake, Loch or Pond
Dunes
Boulders
Coniferous Trees
Non-Coniferous Trees
Orchard
Scrub
Coppice
Bracken
Heath
Rough Grassland
Marsh
Reeds
Saltings
Building
Direction of Flow of Water
Shingle
Sand
Glasshouse
Pylon
Sloping Masonry
Electricity Transmission Line
Pole
Cutting
Embankment
Standard Gauge Multiple Track
Standard Gauge Single Track
Road Under
Road Over
Level Crossing
Foot Bridge
Siding, Tramway or Mineral Line
Narrow Gauge
Geographical County
Administrative County, County Borough or County of City
Municipal Borough, Urban or Rural District, Burgh or District Council
Borough, Burgh or County Constituency
Shown only when not coincident with other boundaries
Civil Parish
Shown alternately when coincidence of boundaries occurs

BP, BS	Boundary Post or Stone	Pol Sta	Police Station
Ch	Church	PO	Post Office
CH	Club House	PC	Public Convenience
F E Sta	Fire Engine Station	PH	Public House
FB	Foot Bridge	SB	Signal Box
Fn	Fountain	Spr	Spring
GP	Guide Post	TCB	Telephone Call Box
MP	Mile Post	TCP	Telephone Call Post
MS	Mile Stone	W	Well

1:10,000 Raster Mapping

Gravel Pit
Refuse tip or slag heap
Rock
Rock (scattered)
Boulders
Boulders (scattered)
Shingle
Mud
Mud
Sand
Sand
Sand Pit
Slopes
Top of cliff
General detail
Underground detail
Overhead detail
Narrow gauge railway
Multi-track railway
Single track railway
County boundary (England only)
Civil, parish or community boundary
District, Unitary, Metropolitan, London Borough boundary
Constituency boundary
Area of wooded vegetation
Non-coniferous trees
Non-coniferous trees (scattered)
Coniferous trees
Coniferous trees (scattered)
Positioned tree
Orchard
Coppice or Osiers
Rough Grassland
Heath
Scrub
Marsh, Salt Marsh or Reeds
Water feature
Flow arrows
MHW(S) Mean high water (springs)
MLW(S) Mean low water (springs)
Telephone line (where shown)
Electricity transmission line (with poles)
BM 123.45 m Bench mark (where shown)
Triangulation station
Point feature (e.g. Guide Post or Mile Stone)
Pylon, flare stack or lighting tower
Site of (antiquity)
Glasshouse
General Building
Important Building

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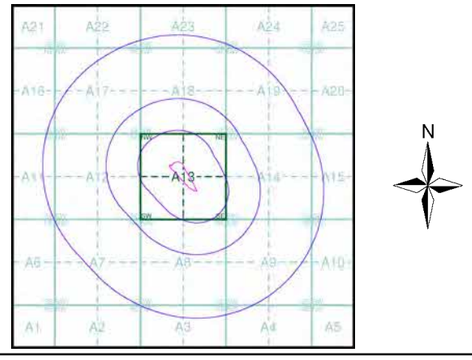
Historical Mapping & Photography included:

Mapping Type	Scale	Date	Pg
Kent	1:10,560	1870	2
Middlesex	1:10,560	1871 - 1873	3
Essex	1:10,560	1873	4
Middlesex	1:10,560	1873	5
London	1:10,560	1896	6
Essex	1:10,560	1898 - 1899	7
Kent	1:10,560	1898 - 1899	8
Kent	1:10,560	1910	9
Essex	1:10,560	1920	10
London	1:10,560	1920	11
Kent	1:10,560	1931	12
Kent	1:10,560	1931	13
Kent	1:10,560	1938	14
Essex	1:10,560	1938	15
London	1:10,560	1938	16
Ordnance Survey Plan	1:10,000	1940	17
Ordnance Survey Plan	1:10,000	1950	18
Ordnance Survey Plan	1:10,000	1962 - 1966	19
Ordnance Survey Plan	1:10,000	1974 - 1975	20
Ordnance Survey Plan	1:10,000	1982 - 1984	21
Ordnance Survey Plan	1:10,000	1989	22
Ordnance Survey Plan	1:10,000	1991 - 1996	23
Ordnance Survey Plan	1:10,000	1996	24
10K Raster Mapping	1:10,000	1999	25
Street View	1:10,000	2015	26

Historical Map - Slice A



Order Details

Order Number: 83661986_1_1
Customer Ref: 1508005.003
National Grid Reference: 543640, 179130
Slice: A
Site Area (Ha): 1.71
Search Buffer (m): 1000

Site Details

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TWEEDIE EVANS CONSULTING

Kent

Published 1870

Source map scale - 1:10,560

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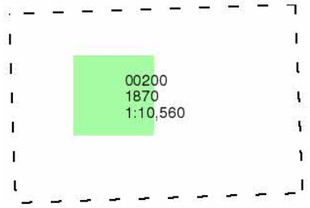
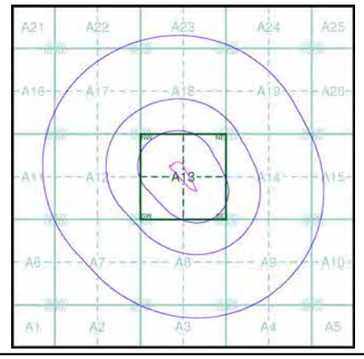
Map Name(s) and Date(s)



Historical Map - Slice A



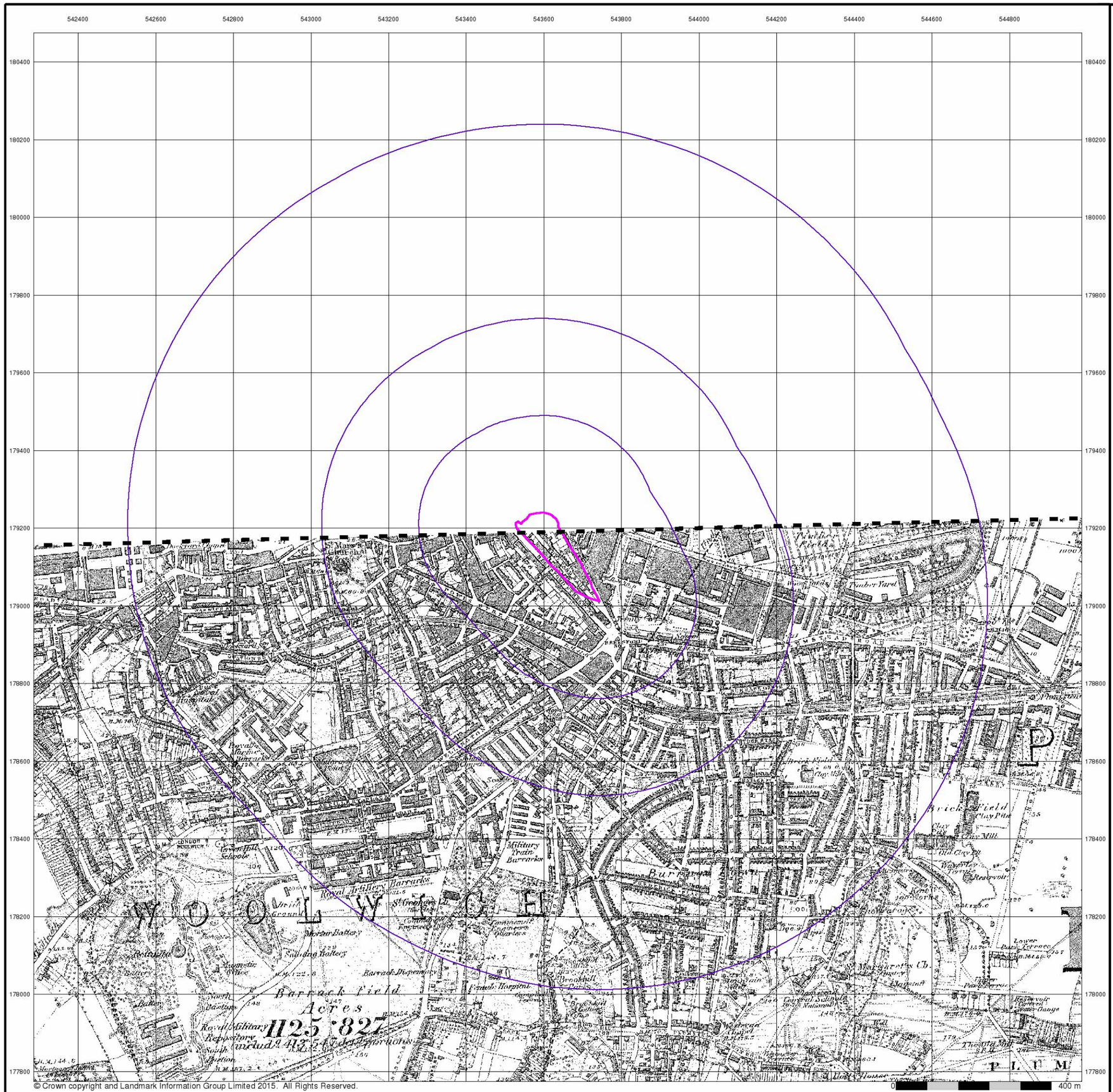
Order Details

Order Number:	83661986_1_1
Customer Ref:	1508005.003
National Grid Reference:	543640, 179130
Slice:	A
Site Area (Ha):	1.71
Search Buffer (m):	1000

Site Details

Phase 18-19, Warren Lane, LONDON

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



TWEEDIE EVANS CONSULTING

Middlesex

Published 1871 - 1873

Source map scale - 1:10,560

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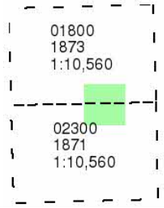
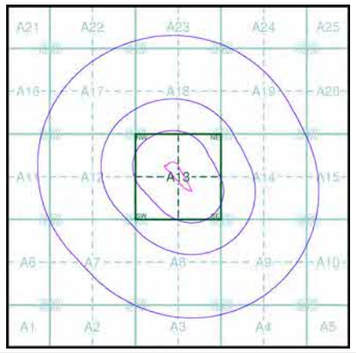


Historical Map - Slice A



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TWEEDIE EVANS CONSULTING

Essex

Published 1873

Source map scale - 1:10,560

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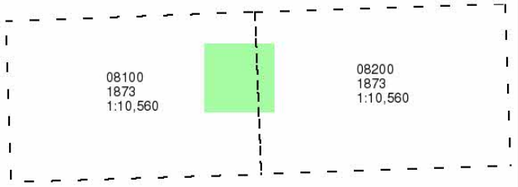
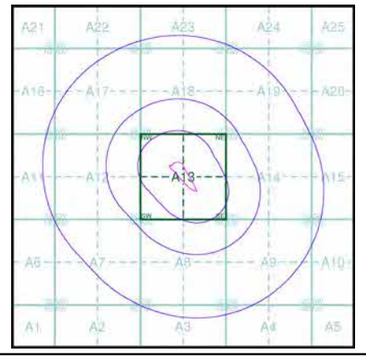


Historical Map - Slice A



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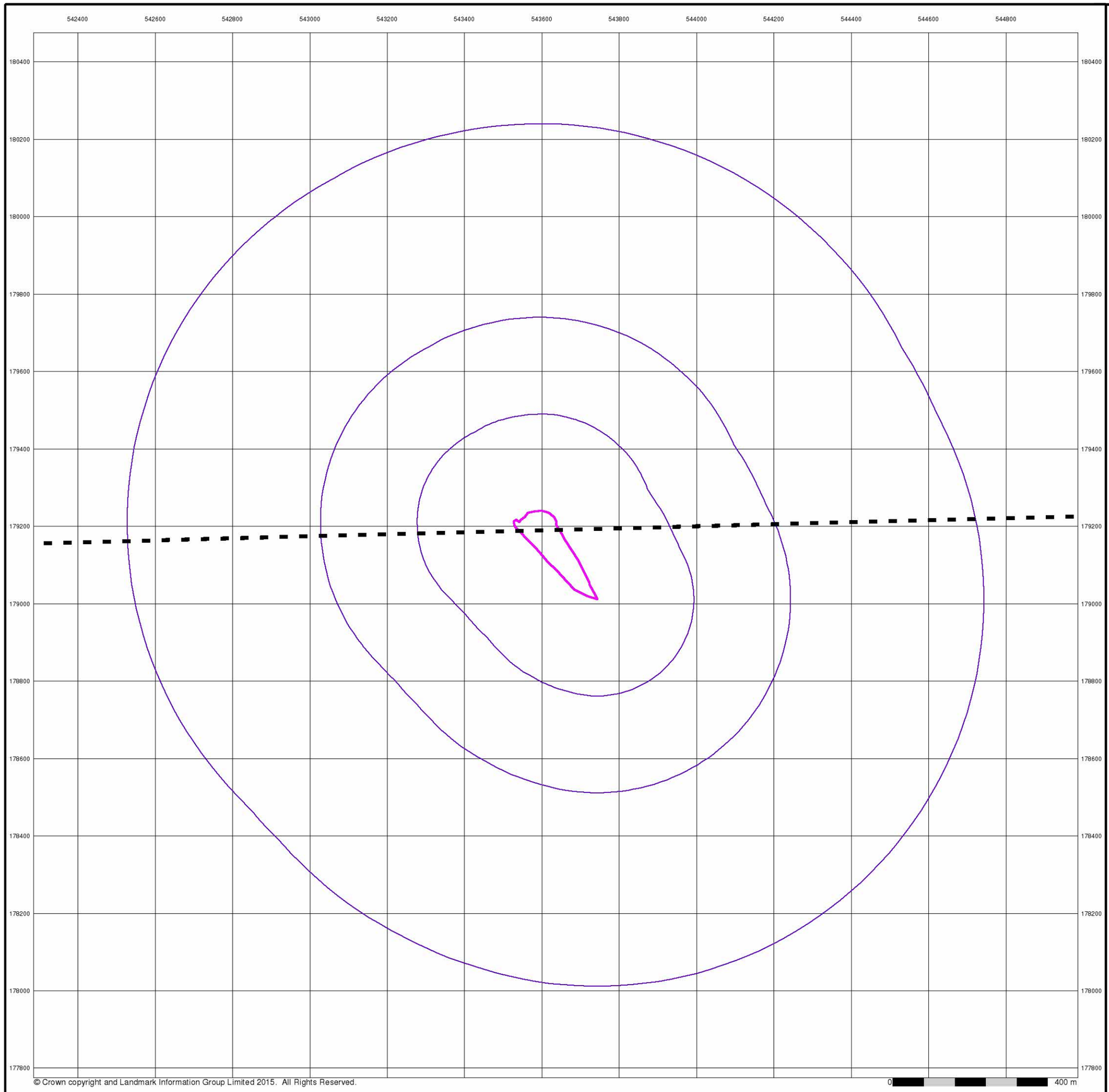

TWEEDIE EVANS CONSULTING

Middlesex

Published 1873

Source map scale - 1:10,560

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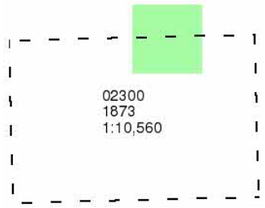
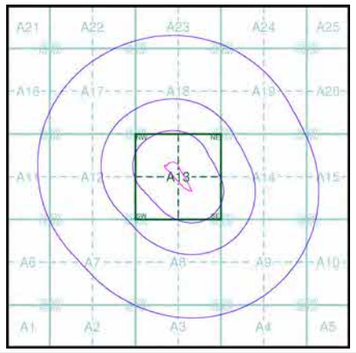


Historical Map - Slice A



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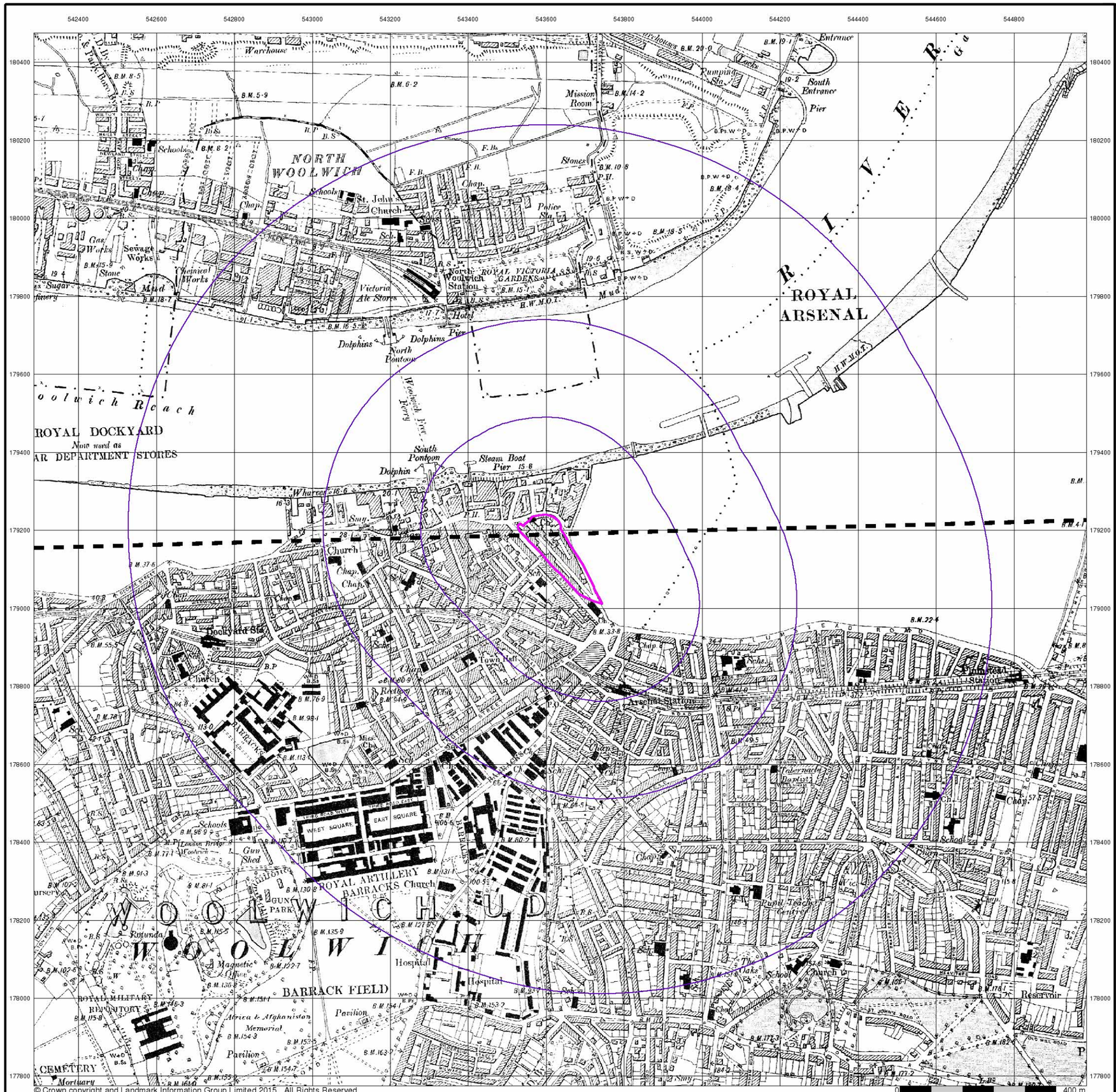

TWEEDIE EVANS CONSULTING

London

Published 1896

Source map scale - 1:10,560

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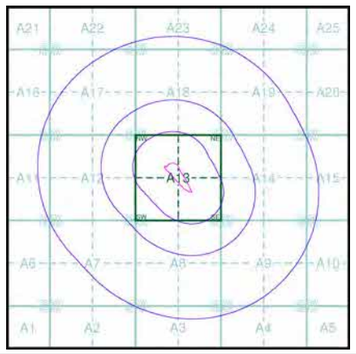
Map Name(s) and Date(s)

008SE
1896
1:10,560

012NE
1896
1:10,560

Historical Map - Slice A



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TWEEDIE EVANS CONSULTING

Essex

Published 1898 - 1899

Source map scale - 1:10,560

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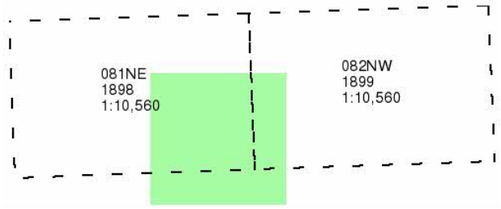
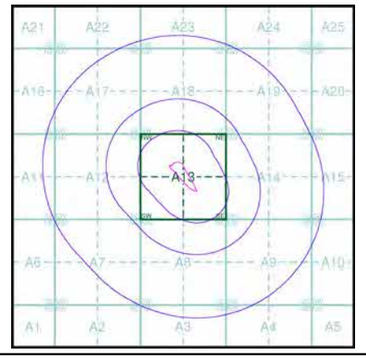


Historical Map - Slice A



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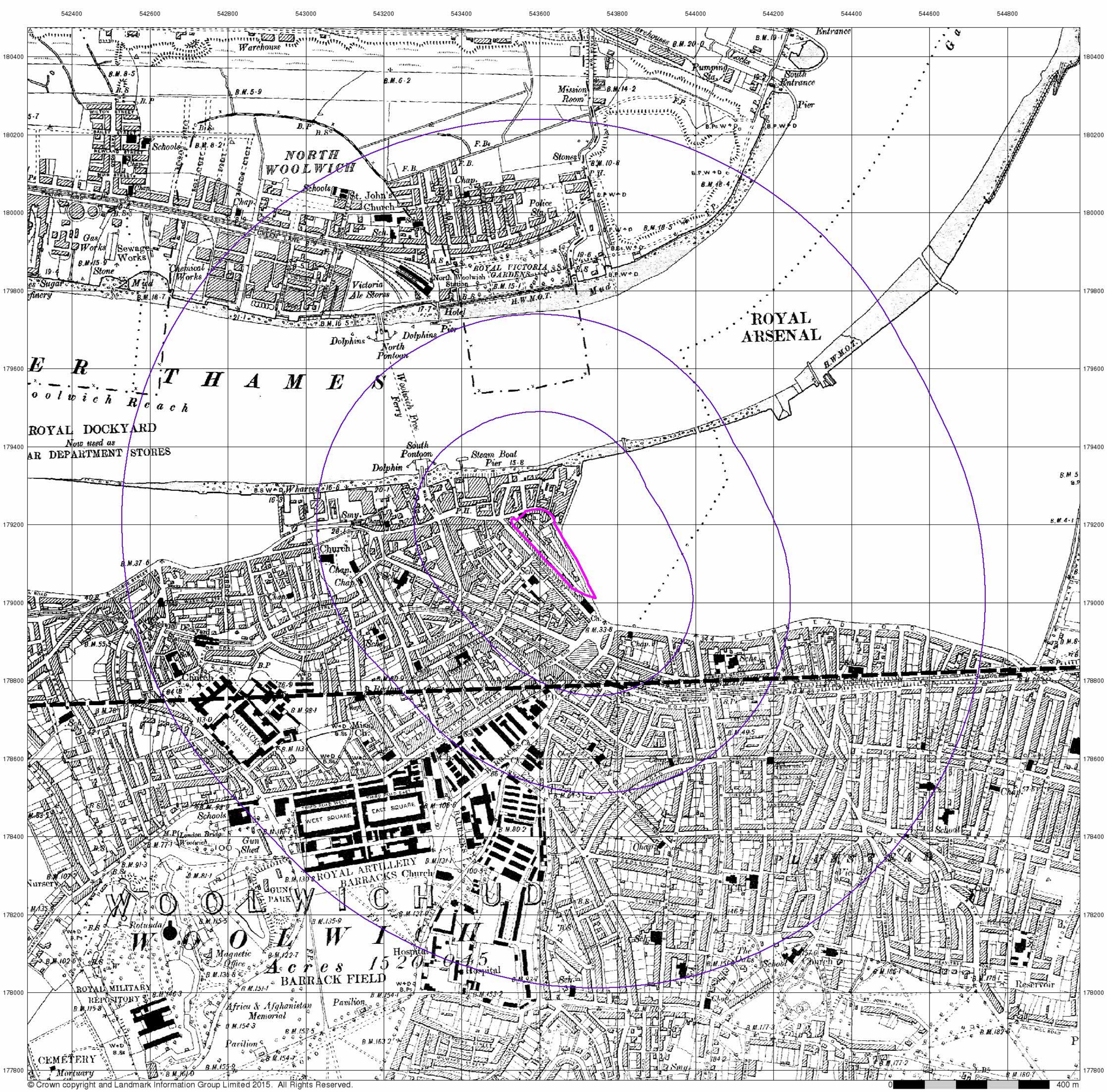

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TWEEDIE EVANS CONSULTING

Kent

Published 1898 - 1899

Source map scale - 1:10,560

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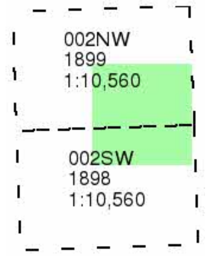
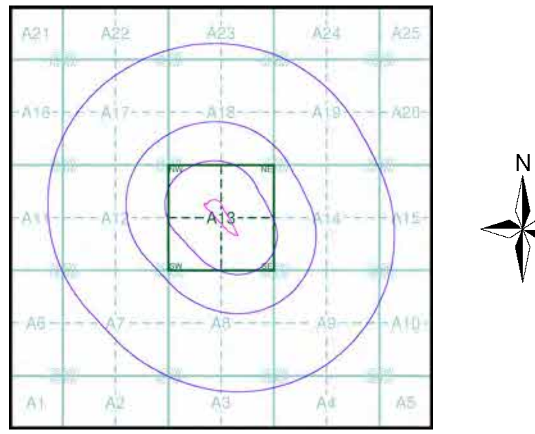


Historical Map - Slice A



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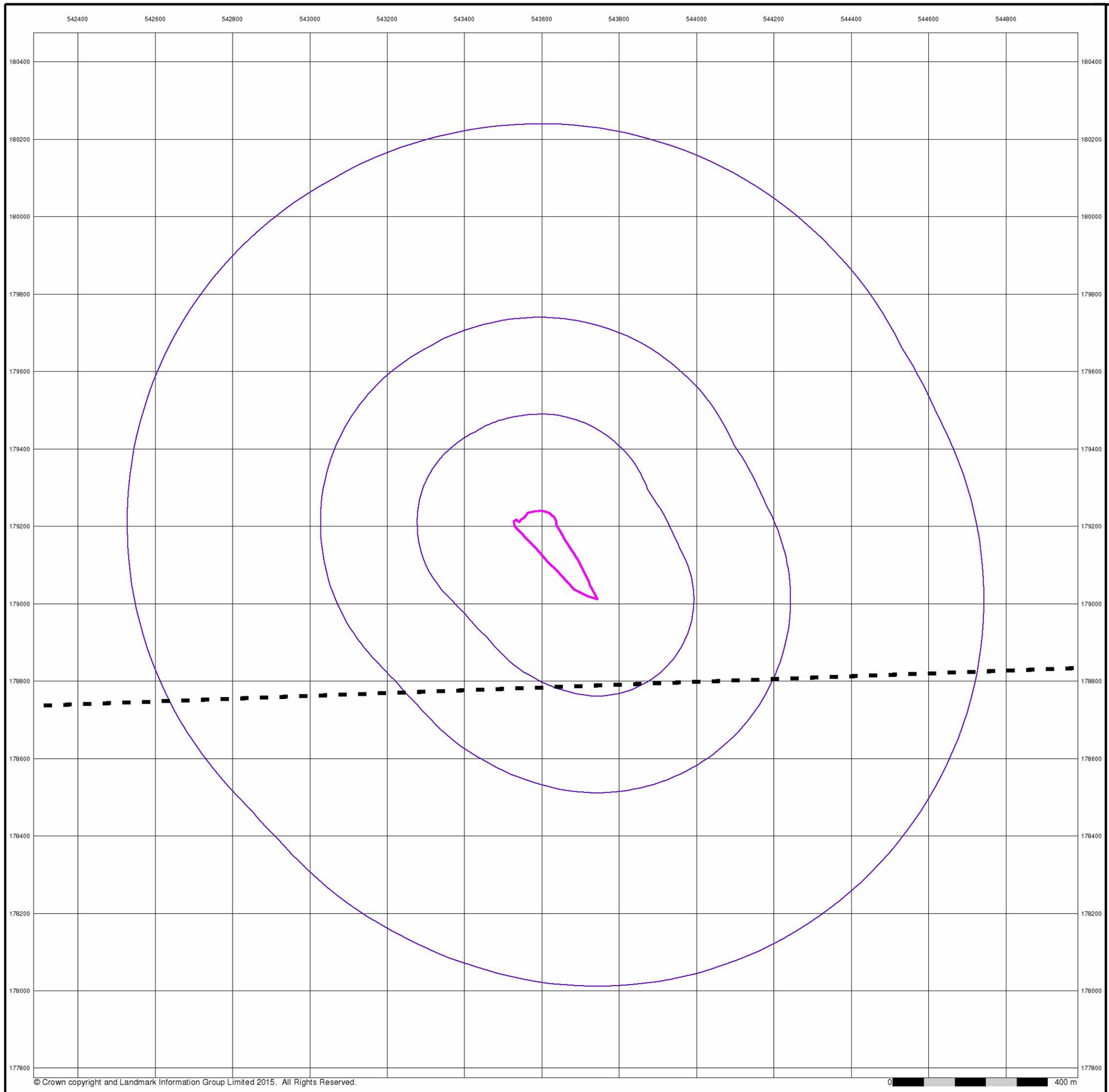

TWEEDIE EVANS CONSULTING

Kent

Published 1910

Source map scale - 1:10,560

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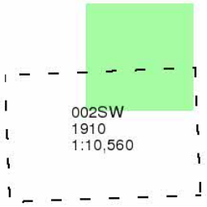
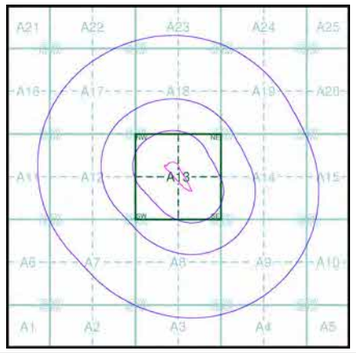


Historical Map - Slice A



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TWEEDIE EVANS CONSULTING

Essex

Published 1920

Source map scale - 1:10,560

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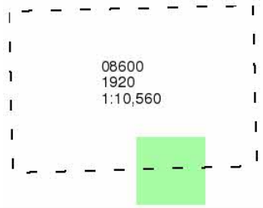
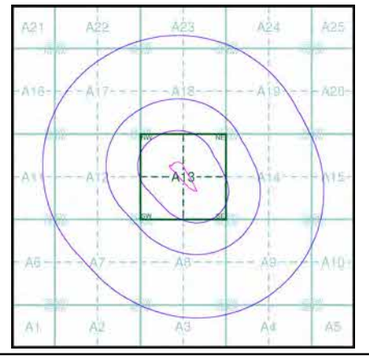


Historical Map - Slice A



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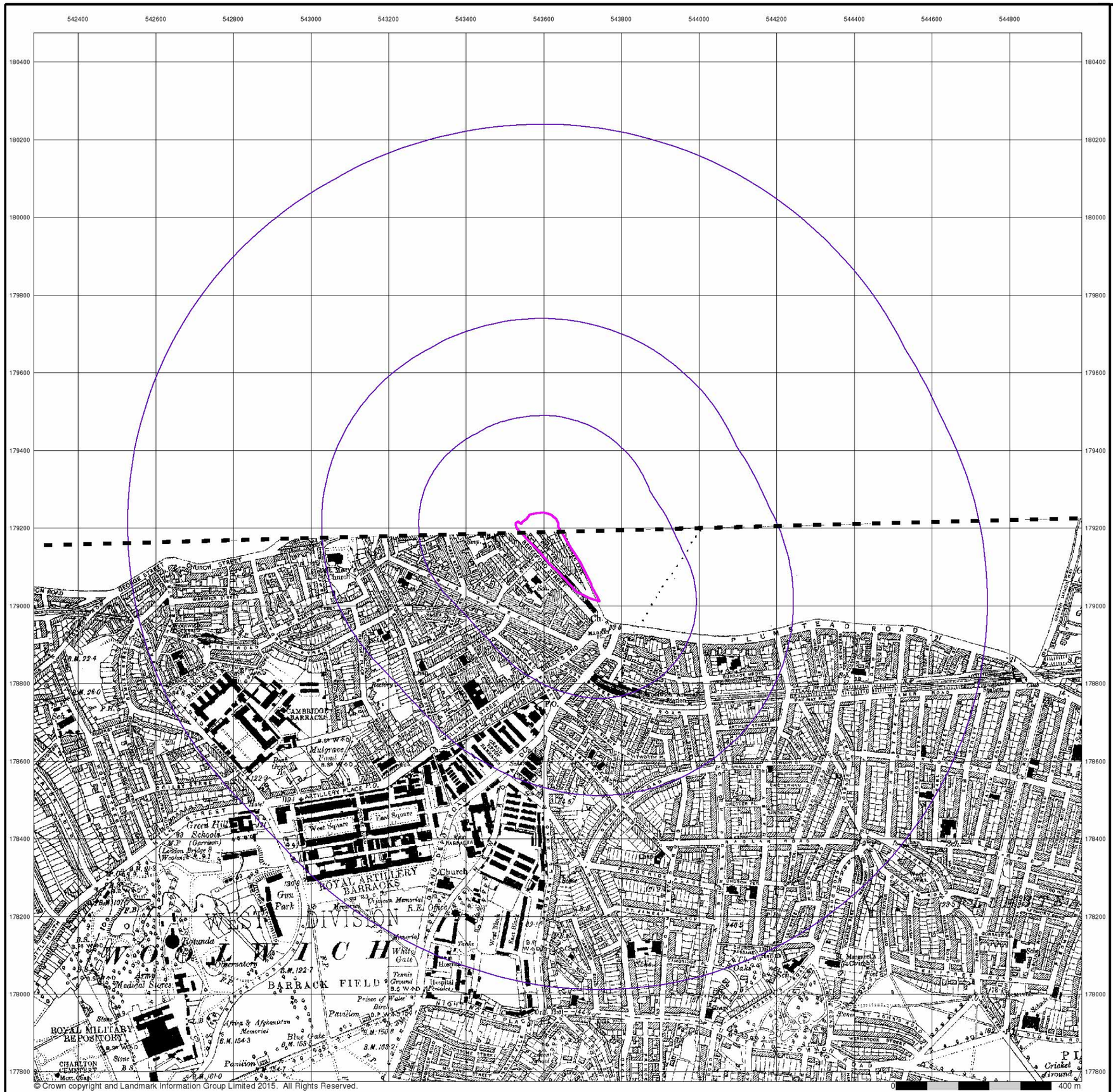

TWEEDIE EVANS CONSULTING

London

Published 1920

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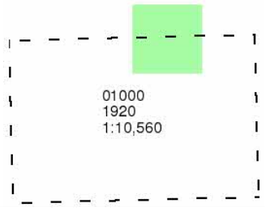
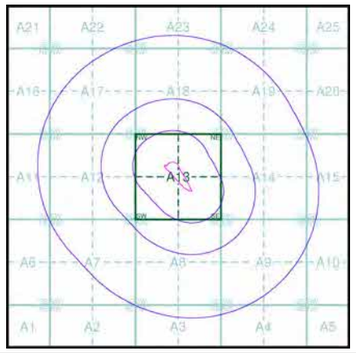


Historical Map - Slice A



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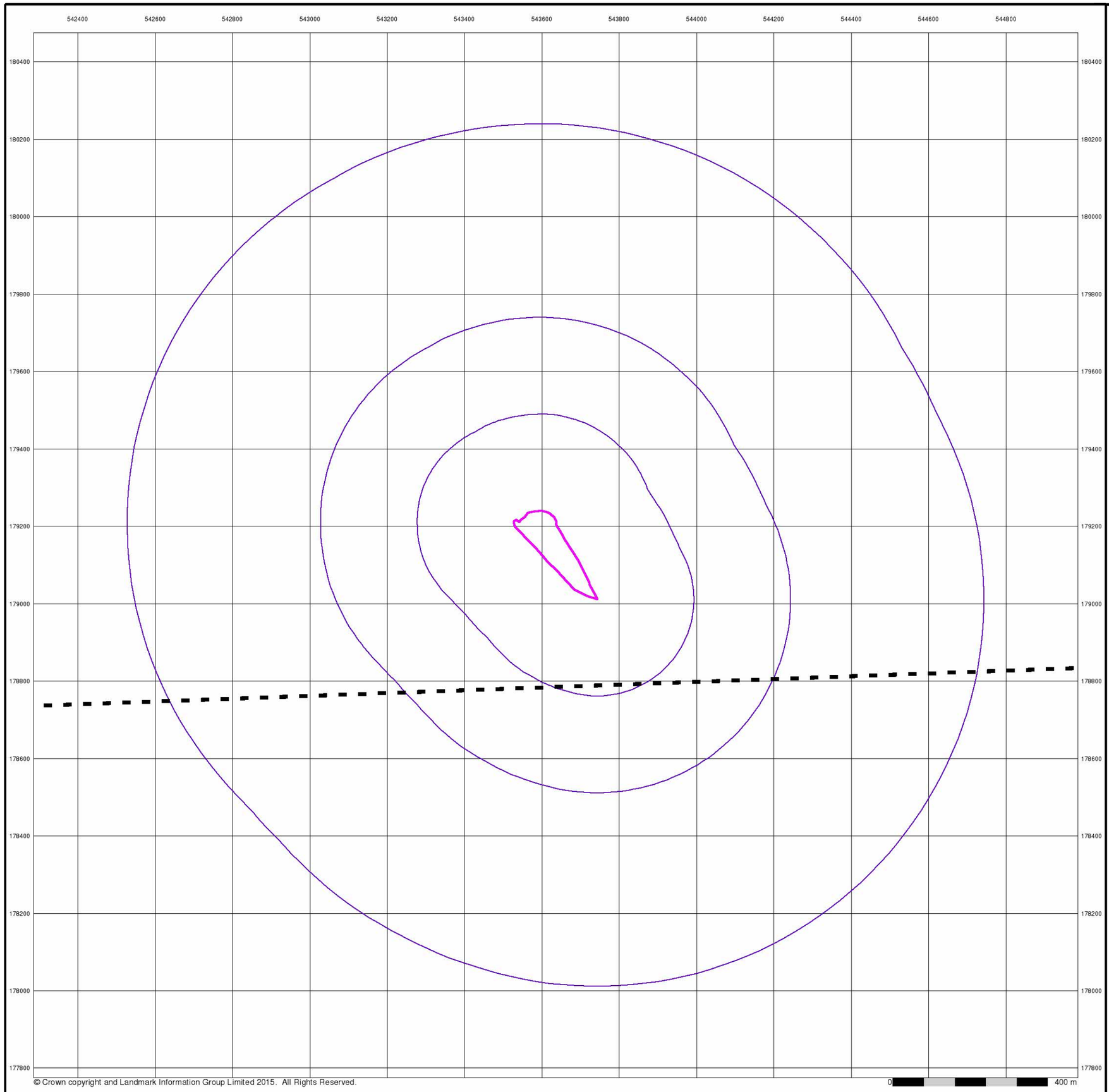

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TWEEDIE EVANS CONSULTING

Kent

Published 1931

Source map scale - 1:10,560

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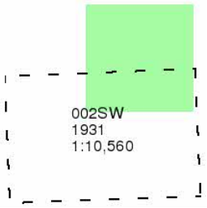
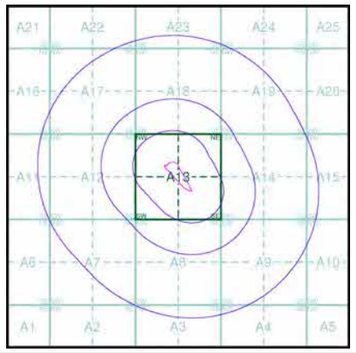


Historical Map - Slice A



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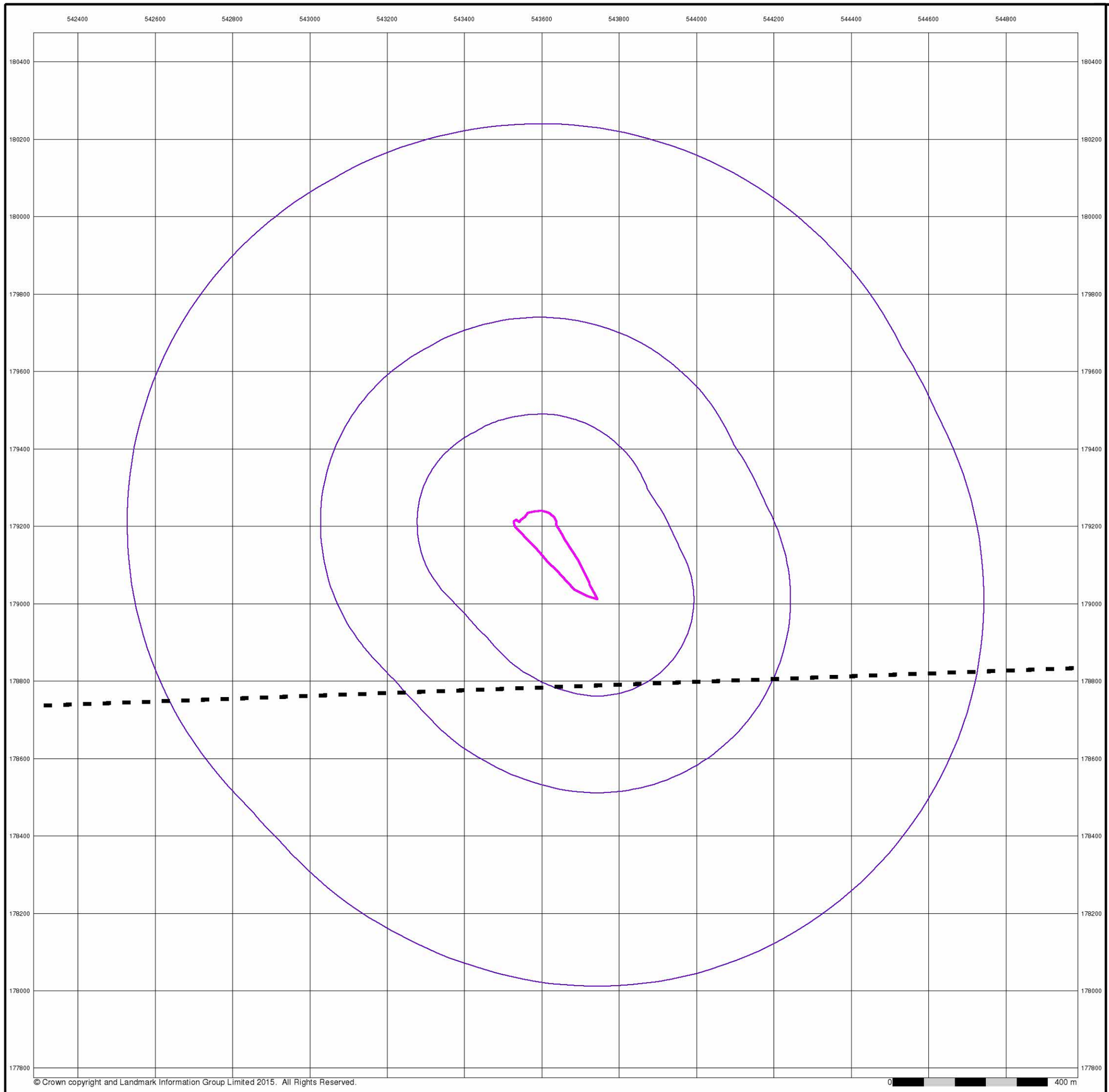

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TWEEDIE EVANS CONSULTING

Kent

Published 1931

Source map scale - 1:10,560

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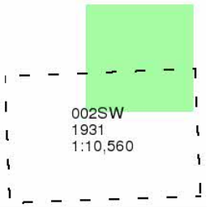
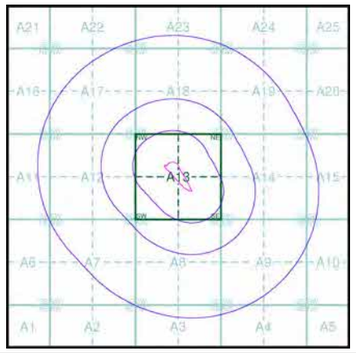
Map Name(s) and Date(s)



Historical Map - Slice A



Order Details

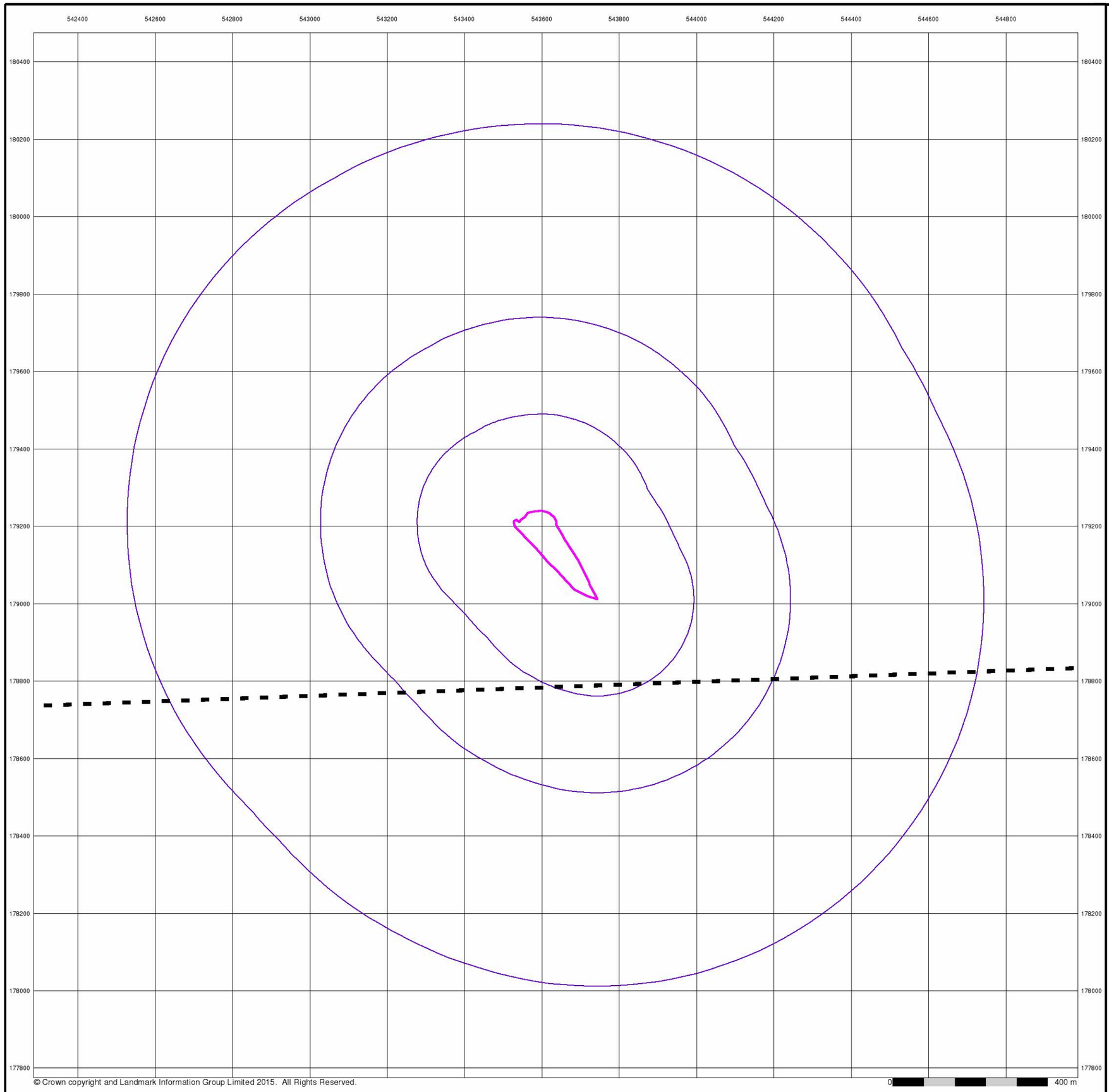
Order Number:	83661986_1_1
Customer Ref:	1508005.003
National Grid Reference:	543640, 179130
Slice:	A
Site Area (Ha):	1.71
Search Buffer (m):	1000

Site Details

Phase 18-19, Warren Lane, LONDON

Landmark Information Group

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



TWEEDIE EVANS CONSULTING

Kent

Published 1938

Source map scale - 1:10,560

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

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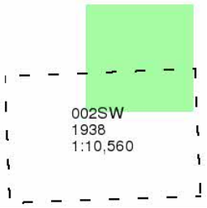
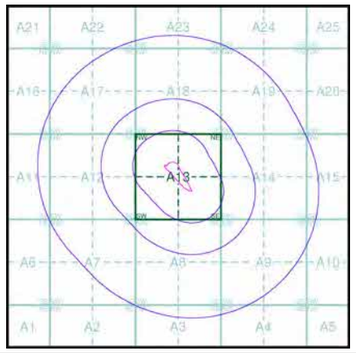


Historical Map - Slice A



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TWEEDIE EVANS CONSULTING

Essex

Published 1938

Source map scale - 1:10,560

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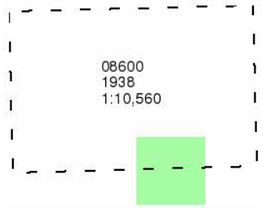
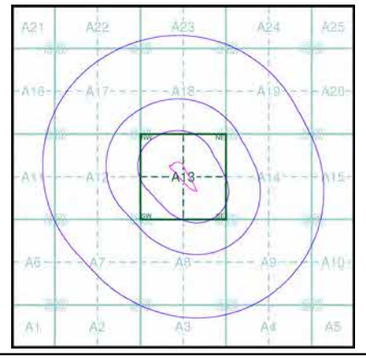


Historical Map - Slice A



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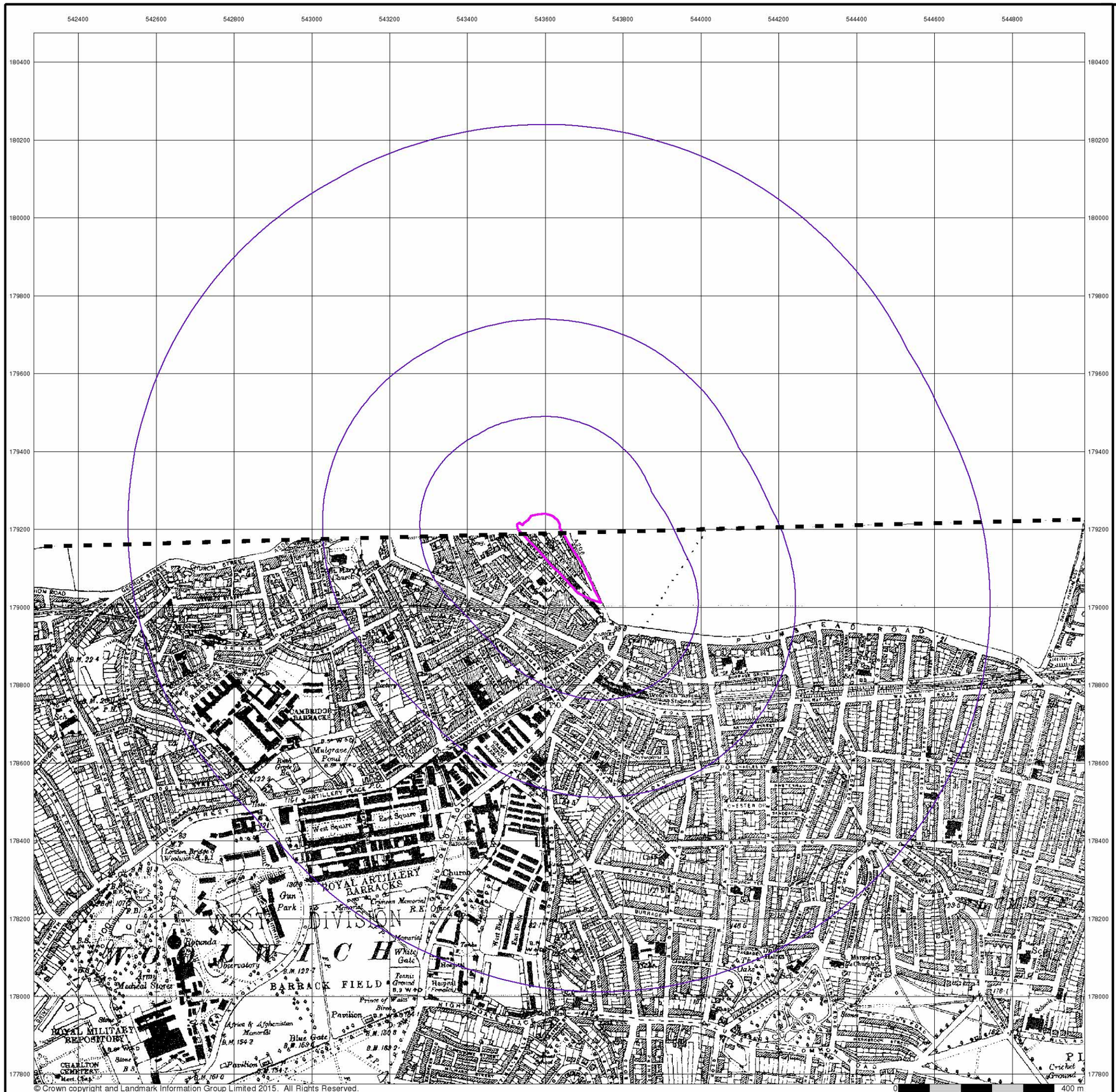

TWEEDIE EVANS CONSULTING

London

Published 1938

Source map scale - 1:10,560

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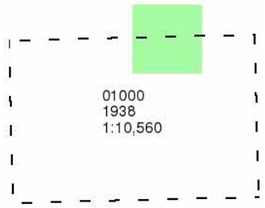
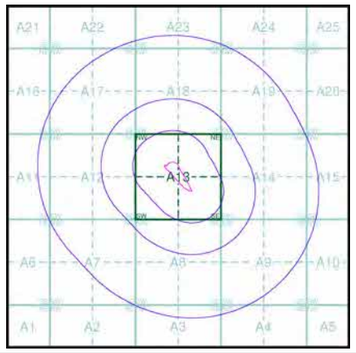


Historical Map - Slice A



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TWEEDIE EVANS CONSULTING

Ordnance Survey Plan

Published 1940

Source map scale - 1:10,000

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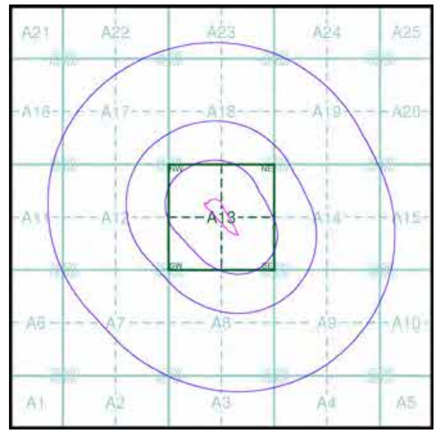
Map Name(s) and Date(s)

TQ48SW
1940
1:10,560

TQ47NW
1940
1:10,560

Historical Map - Slice A



N

Order Details

Order Number: 83661986_1_1
Customer Ref: 1508005.003
National Grid Reference: 543640, 179130
Slice: A
Site Area (Ha): 1.71
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Site Details

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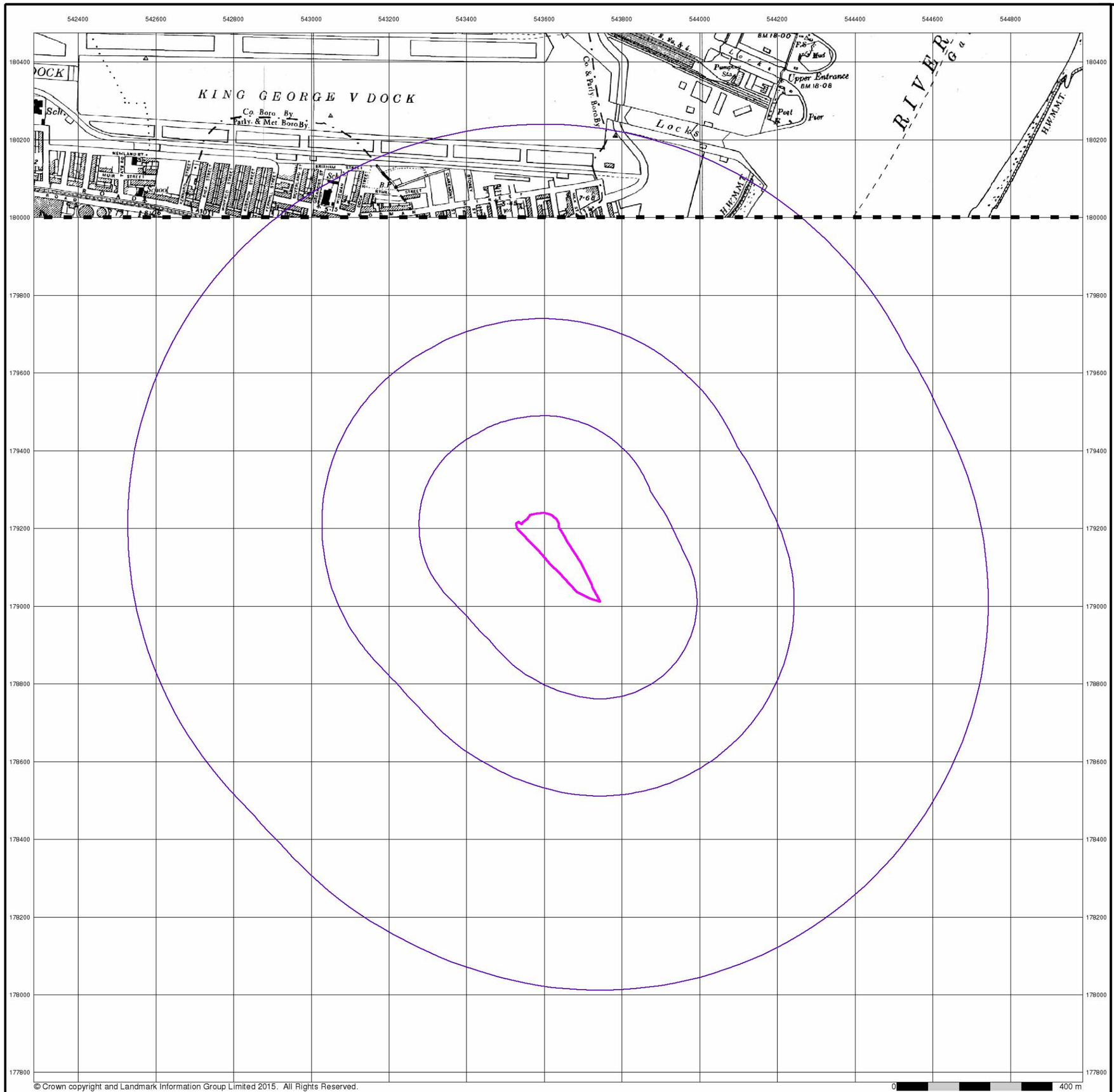

TWEEDIE EVANS CONSULTING

Ordnance Survey Plan

Published 1950

Source map scale - 1:10,000

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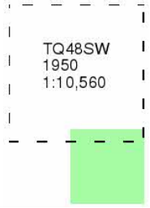
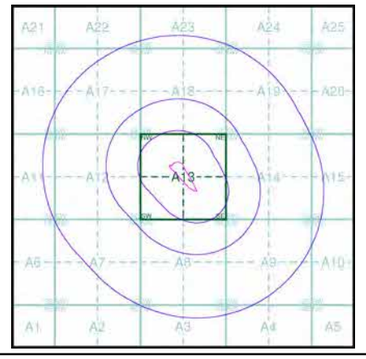
Map Name(s) and Date(s)



Historical Map - Slice A



Order Details

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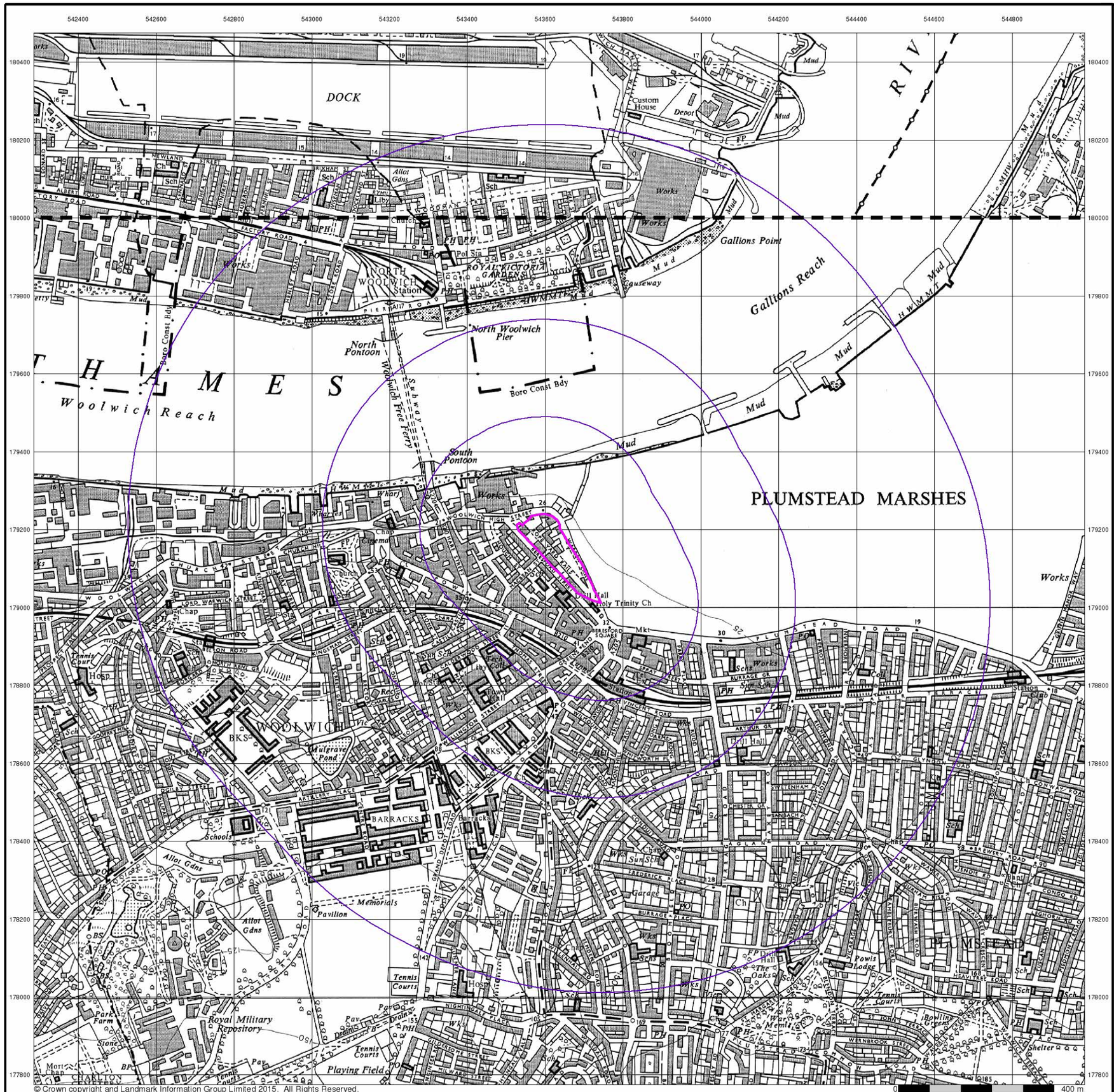

TWEEDIE EVANS CONSULTING

Ordnance Survey Plan

Published 1962 - 1966

Source map scale - 1:10,000

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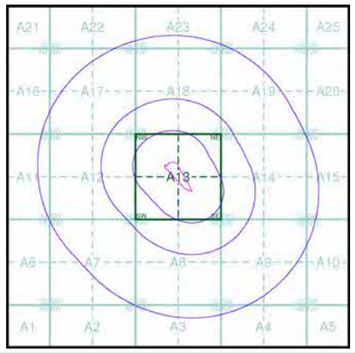
Map Name(s) and Date(s)

TQ48SW
1966
1:10,560

TQ47NW
1962
1:10,560

Historical Map - Slice A



Order Details

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Customer Ref:	1508005.003
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Site Details

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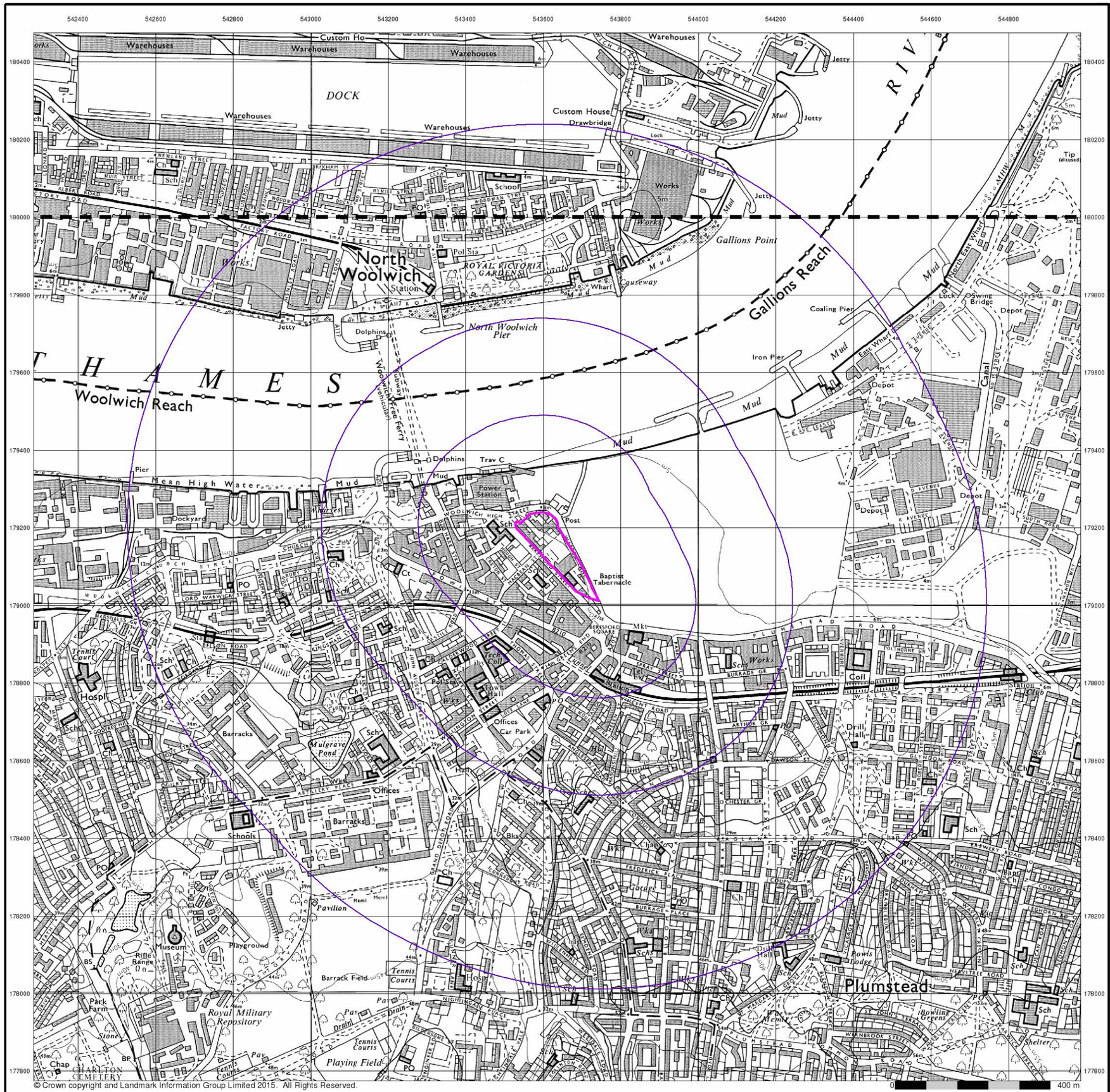

TWEEDIE EVANS CONSULTING

Ordnance Survey Plan

Published 1974 - 1975

Source map scale - 1:10,000

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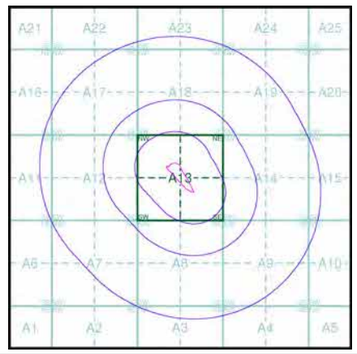
Map Name(s) and Date(s)

TQ48SW
1975
1:10,000

TQ47NW
1974
1:10,000

Historical Map - Slice A



Order Details

Order Number:	83661986_1_1
Customer Ref:	1508005.003
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Site Area (Ha):	1.71
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Ordnance Survey Plan

Published 1982 - 1984

Source map scale - 1:10,000

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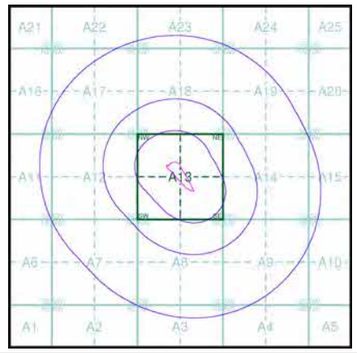
Map Name(s) and Date(s)

TQ48SW
1984
1:10,000

TQ47NW
1982
1:10,000

Historical Map - Slice A



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TWEEDIE EVANS CONSULTING

Ordnance Survey Plan

Published 1989

Source map scale - 1:10,000

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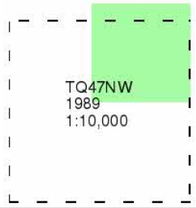
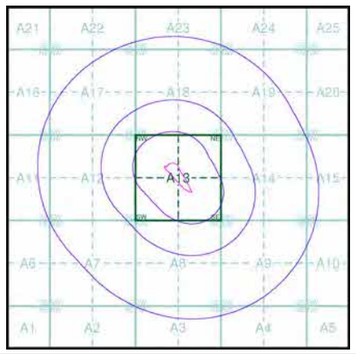


Historical Map - Slice A



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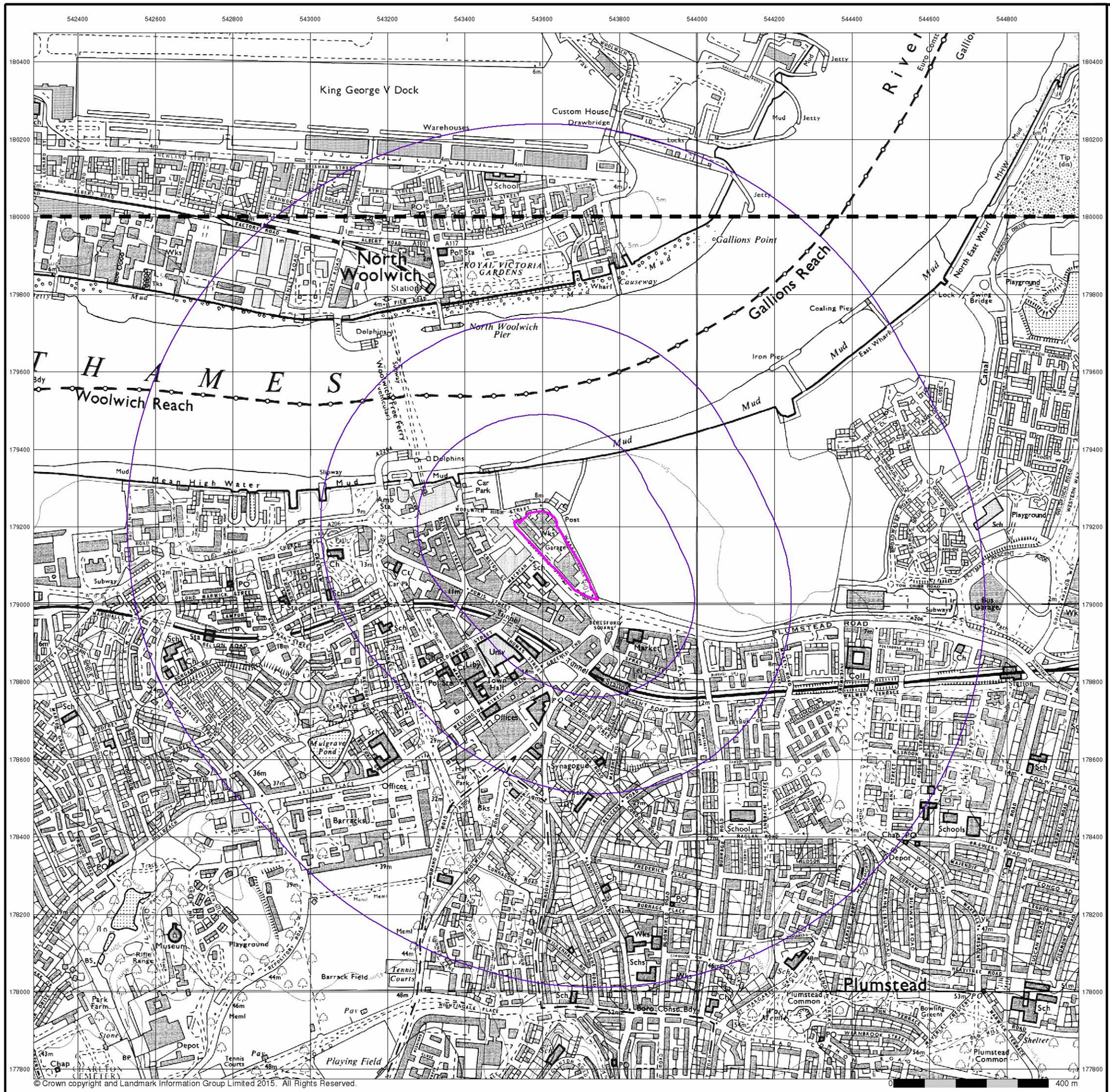

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Ordnance Survey Plan

Published 1991 - 1996

Source map scale - 1:10,000

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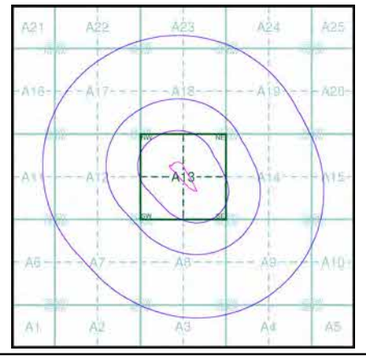
Map Name(s) and Date(s)

TQ48SW
1991
1:10,000

TQ47NW
1996
1:10,000

Historical Map - Slice A



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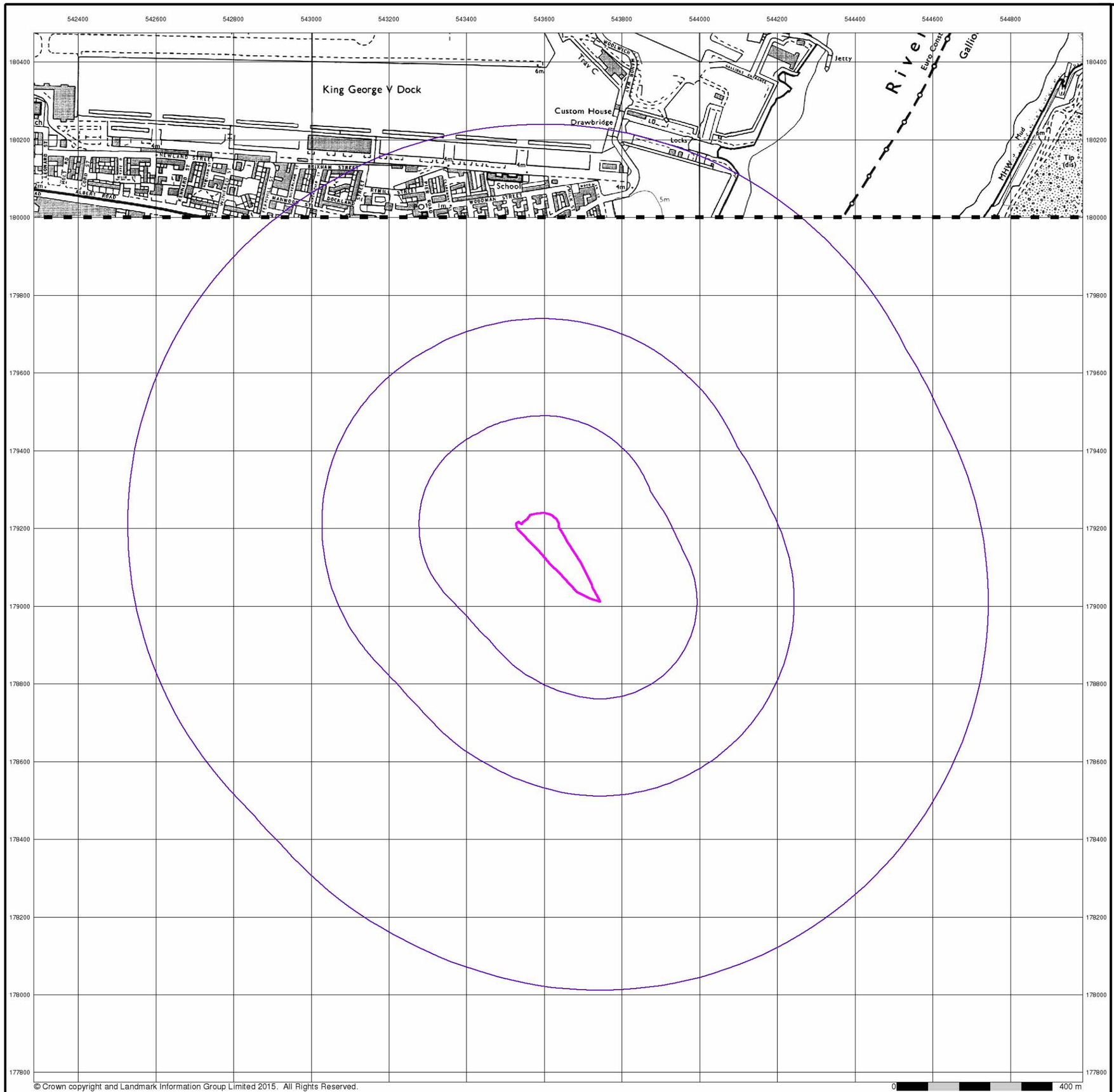

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Ordnance Survey Plan

Published 1996

Source map scale - 1:10,000

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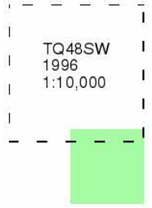
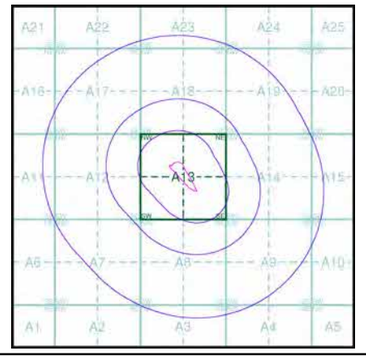
Map Name(s) and Date(s)



Historical Map - Slice A



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10k Raster Mapping

Published 1999

Source map scale - 1:10,000

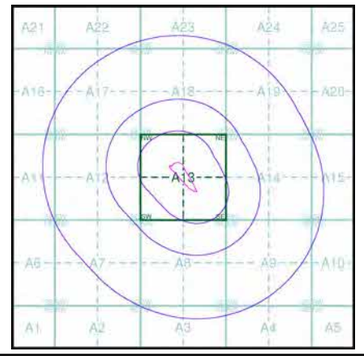
The historical maps shown were produced from the Ordnance Survey`s 1:10,000 colour raster mapping. These maps are derived from Landplan which replaced the old 1:10,000 maps originally published in 1970. The data is highly detailed showing buildings, fences and field boundaries as well as all roads, tracks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

Map Name(s) and Date(s)

TQ48SW
1999
1:10,000

TQ47NW
1999
1:10,000

Historical Map - Slice A



Order Details

Order Number:	83661986_1_1
Customer Ref:	1508005.003
National Grid Reference:	543640, 179130
Slice:	A
Site Area (Ha):	1.71
Search Buffer (m):	1000

Site Details

Phase 18-19, Warren Lane, LONDON

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

0 400 m

TWEEDIE EVANS CONSULTING

Street View

Published 2015

Source map scale - 1:10,000

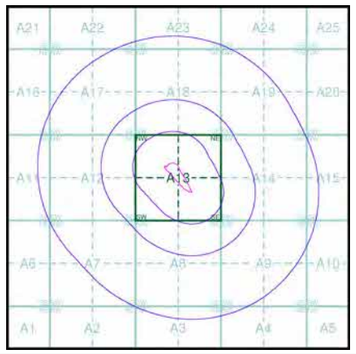
Street View is a street-level map for the whole of Great Britain produced by the Ordnance Survey. These maps are provided at a nominal scale of 1:10,000

Map Name(s) and Date(s)

TQ48SW
2015
1:10,000

TQ47NW
2015
1:10,000

Street View Map - Slice A



Order Details

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Customer Ref:	1508005.003
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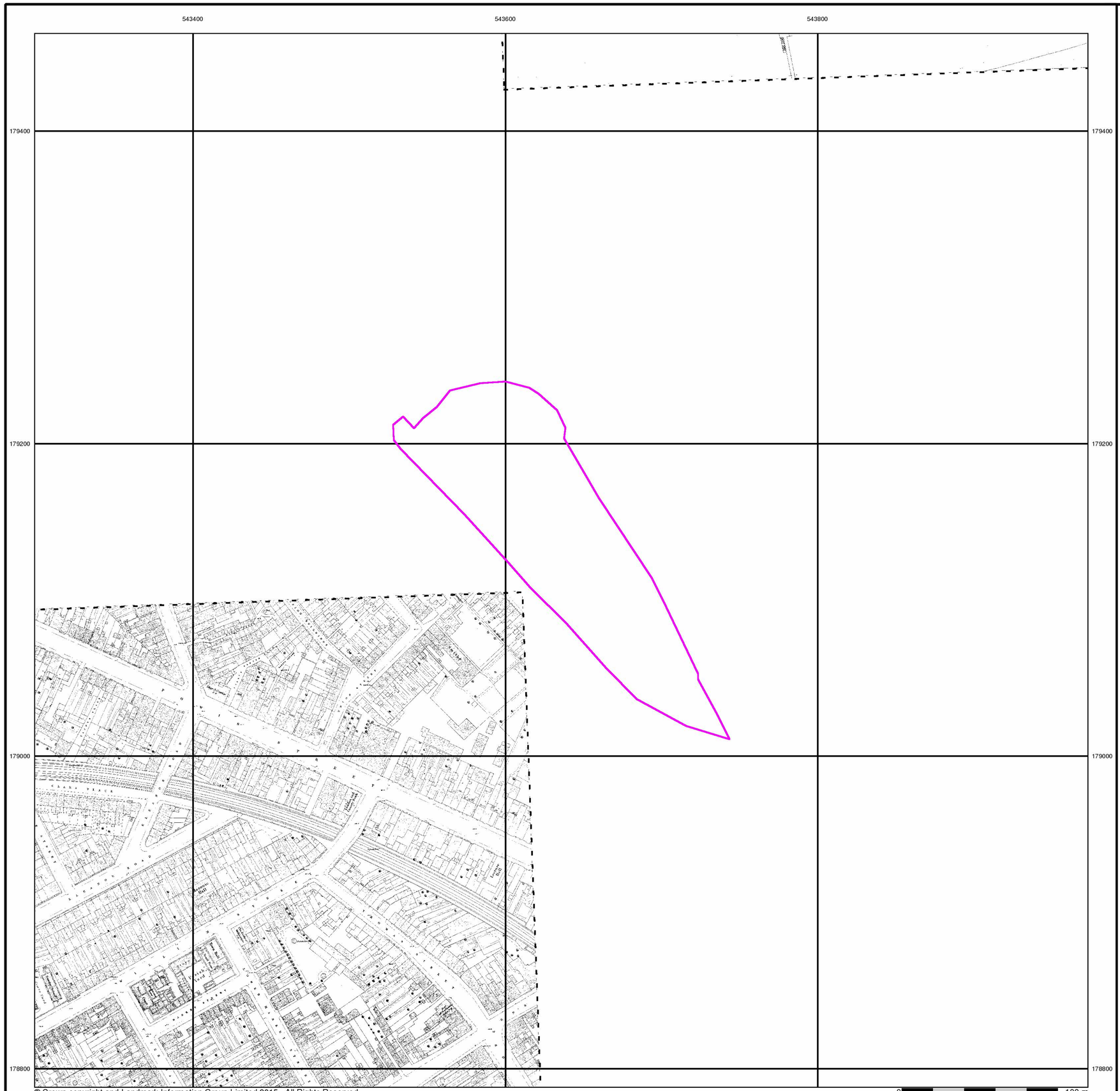


0 100 m

TWEEDIE EVANS CONSULTING

Kent

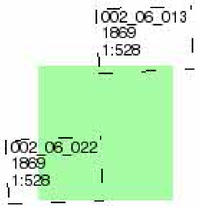
Published 1869

Source map scale - 1:528

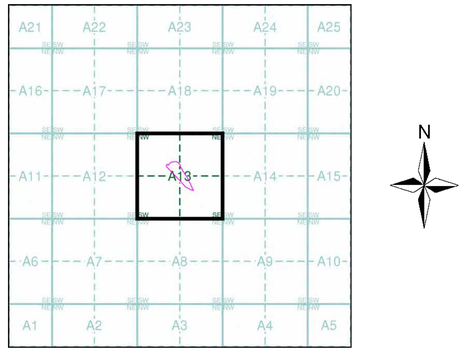
The 1:528 scale Ordnance Survey mapping was adopted in 1850 as an alternative to the 1:1056 scale, that had been deemed to be inadequate for sanitary planning, which had come very much to the fore following the passing of the Public Health Act of 1948. Around 29 towns in England and Wales were surveyed at this scale, the bulk of which were undertaken between 1850 and 1855. These were predominantly towns that were outside the areas being surveyed at 1:10,560 or 1:2500 scale. As well as showing the details characteristic of the later 1:500 plans, they show features of sanitary interest such as privies, taps, cow houses, cess pits, brew and bake houses and cart sheds and stables.

Please note: Due to the partial coverage of Historical Town Plans, it is possible that not all segments within an order will contain mapping. Only the segments that have Town Plan coverage will be generated.

Map Name(s) and Date(s)



Historical Town Plan - Segment A13



Order Details

Order Number:	83661986_1_1
Customer Ref:	1508005.003
National Grid Reference:	543640, 179130
Slice:	A
Site Area (Ha):	1.71
Search Buffer (m):	0

Site Details

Phase 18-19, Warren Lane, LONDON

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Tel: 0844 844 9952
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TWEEDIE EVANS CONSULTING

Kent

Published 1895

Source map scale - 1:528

The 1:528 scale Ordnance Survey mapping was adopted in 1850 as an alternative to the 1:1056 scale, that had been deemed to be inadequate for sanitary planning, which had come very much to the fore following the passing of the Public Health Act of 1948. Around 29 towns in England and Wales were surveyed at this scale, the bulk of which were undertaken between 1850 and 1855. These were predominantly towns that were outside the areas being surveyed at 1:10,560 or 1:2500 scale. As well as showing the details characteristic of the later 1:500 plans, they show features of sanitary interest such as privies, taps, cow houses, cess pits, brew and bake houses and cart sheds and stables.

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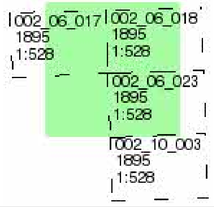
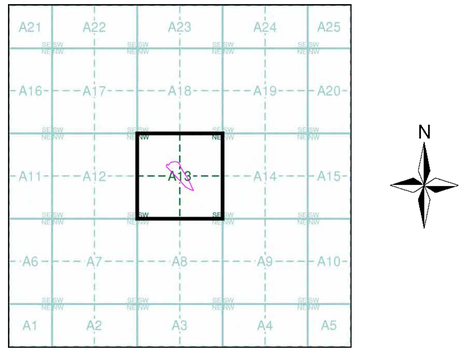
Map Name(s) and Date(s)



Historical Town Plan - Segment A13



Order Details

Order Number:	83661986_1_1
Customer Ref:	1508005.003
National Grid Reference:	543640, 179130
Slice:	A
Site Area (Ha):	1.71
Search Buffer (m):	0

Site Details

Phase 18-19, Warren Lane, LONDON

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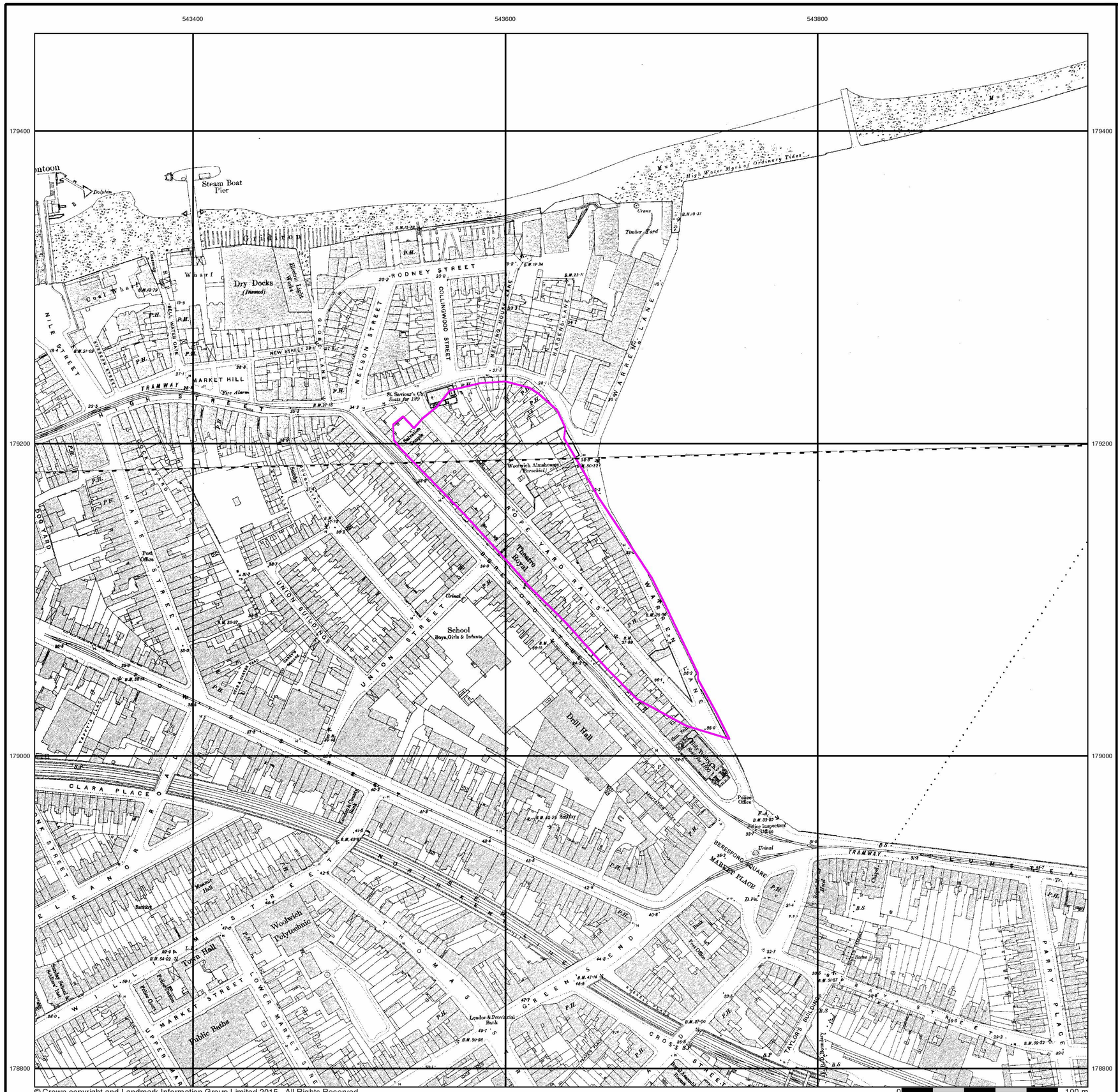


TWEEDIE EVANS CONSULTING

London

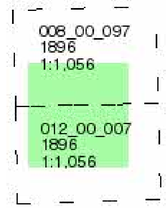
Published 1896

Source map scale - 1:1,056

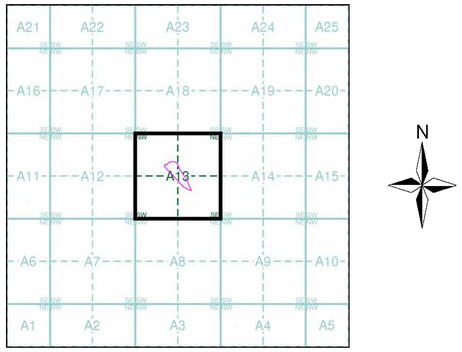
The 1:1056 scale of Ordnance Survey mapping was adopted from Ireland in 1848 and was used to survey towns with a population of over 4000, plus county towns of lesser population, in those counties mapped at the six-inch scale in 1841-55. The scale was the largest scale at which London was mapped by the Ordnance Survey and a 'skeleton' survey of the capital, showing little more than streets, street names, frontages and altitudes, was undertaken between 1848 and 1850. The majority of the 1:1056 surveys were later replaced by 1:500 surveys; although almost all the remainder were revised at this scale, sometimes more than once before 1895. The type of detail shown on the 1:1056 scale is broadly similar to that on 1:500; the apparent omission of minor details such as sewer access points and street lights may be as much a reflection of the generally earlier date of these plans, as of the specification of the map.

Please note: Due to the partial coverage of Historical Town Plans, it is possible that not all segments within an order will contain mapping. Only the segments that have Town Plan coverage will be generated.

Map Name(s) and Date(s)



Historical Town Plan - Segment A13



Order Details

Order Number:	83661986_1_1
Customer Ref:	1508005.003
National Grid Reference:	543640, 179130
Slice:	A
Site Area (Ha):	1.71
Search Buffer (m):	0

Site Details

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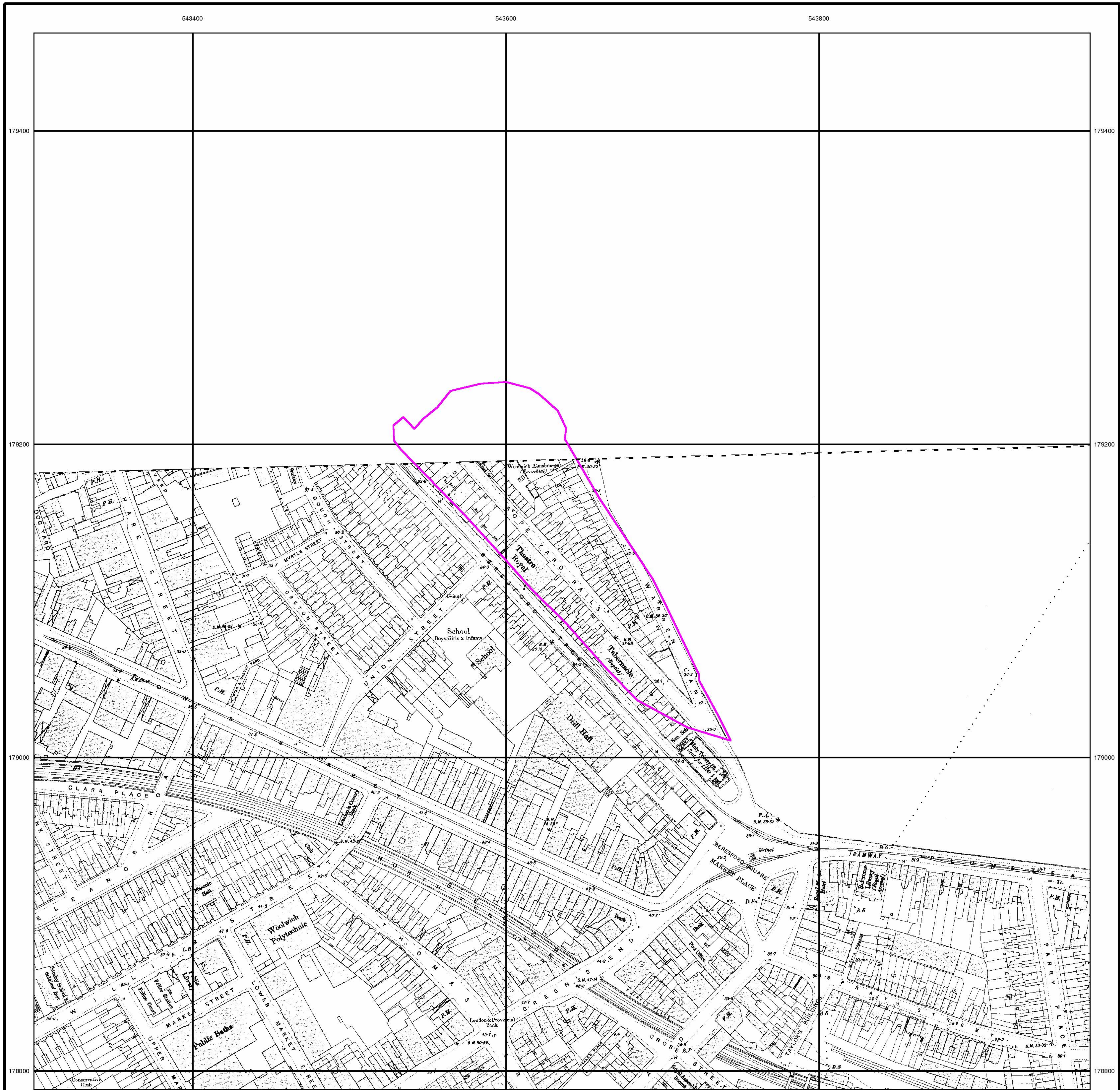

TWEEDIE EVANS CONSULTING

London

Published 1907

Source map scale - 1:1,056

The 1:1056 scale of Ordnance Survey mapping was adopted from Ireland in 1848 and was used to survey towns with a population of over 4000, plus county towns of lesser population, in those counties mapped at the six-inch scale in 1841-55. The scale was the largest scale at which London was mapped by the Ordnance Survey and a 'skeleton' survey of the capital, showing little more than streets, street names, frontages and altitudes, was undertaken between 1848 and 1850. The majority of the 1:1056 surveys were later replaced by 1:500 surveys; although almost all the remainder were revised at this scale, sometimes more than once before 1895. The type of detail shown on the 1:1056 scale is broadly similar to that on 1:500; the apparent omission of minor details such as sewer access points and street lights may be as much a reflection of the generally earlier date of these plans, as of the specification of the map.

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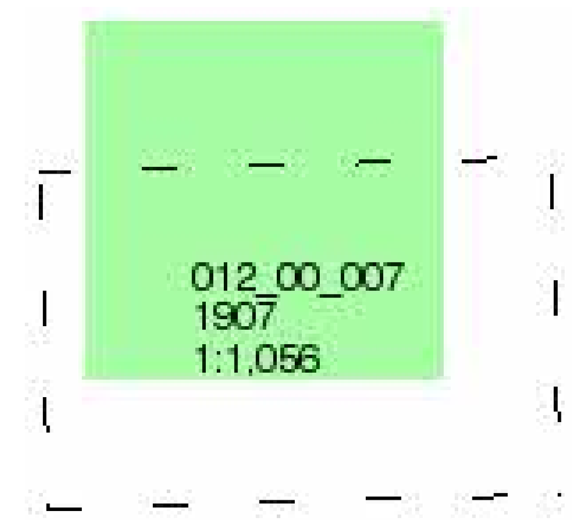
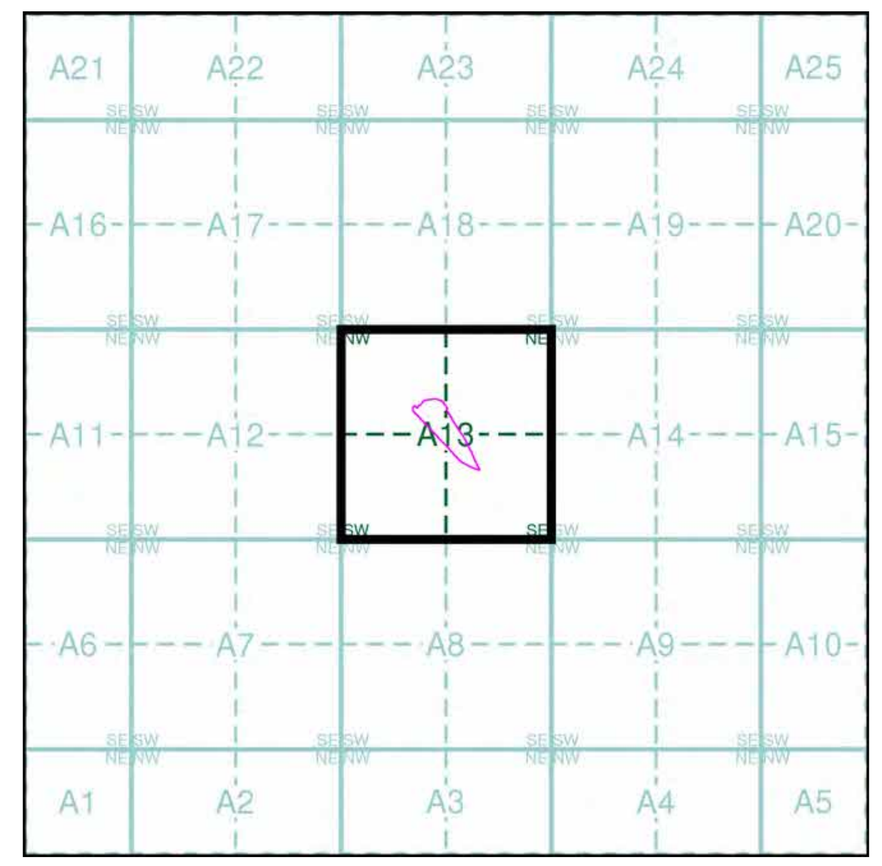
Map Name(s) and Date(s)



Historical Town Plan - Segment A13



N

Order Details

Order Number: 83661986_1_1
Customer Ref: 1508005.003
National Grid Reference: 543640, 179130
Slice: A
Site Area (Ha): 1.71
Search Buffer (m): 0

Site Details

Phase 18-19, Warren Lane, LONDON

Landmark Information Group

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

APPENDIX C

Envirocheck®

TWEEDIE EVANS CONSULTING

Envirocheck® Report:

Datasheet

Order Details:

Order Number:
83661986_1_1

Customer Reference:
1508005.003

National Grid Reference:
543640, 179130

Slice:
A

Site Area (Ha):
1.71

Search Buffer (m):
1000

Site Details:

Phase 18-19
Warren Lane
LONDON

Client Details:

Mr E Tweedie
Tweedie Evans Consulting Ltd
The Old Chapel
35a Southover
Wells
Somerset
BA5 1UH

Landmark Information Group

TWEEDIE EVANS CONSULTING

Contents

Report Section	Page Number
Summary	-
Agency & Hydrological	1
Waste	13
Hazardous Substances	-
Geological	15
Industrial Land Use	17
Sensitive Land Use	33
Data Currency	34
Data Suppliers	40
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Introduction

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

In the attached datasheet the National Grid References (NGRs) are rounded to the nearest 10m in accordance with Landmark's agreements with a number of Data Suppliers.

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Natural England Copyright Notice

Ove Arup Copyright Notice

Peter Brett Associates Copyright Notice

Radon Potential dataset Copyright Notice

Report Version v50.0

TWEEDIE EVANS CONSULTING

Summary

Data Type	Page Number	On Site	0 to 250m	251 to 500m	501 to 1000m (*up to 2000m)
Agency & Hydrological					
BGS Groundwater Flooding Susceptibility	pg 1	Yes	Yes	Yes	n/a
Contaminated Land Register Entries and Notices					
Discharge Consents	pg 2		1		15
Prosecutions Relating to Controlled Waters			n/a	n/a	n/a
Enforcement and Prohibition Notices					
Integrated Pollution Controls					
Integrated Pollution Prevention And Control					
Local Authority Integrated Pollution Prevention And Control					
Local Authority Pollution Prevention and Controls	pg 6		1	2	6
Local Authority Pollution Prevention and Control Enforcements					
Nearest Surface Water Feature	pg 7		Yes		
Pollution Incidents to Controlled Waters	pg 7			1	8
Prosecutions Relating to Authorised Processes					
Registered Radioactive Substances	pg 9			3	2
River Quality					
River Quality Biology Sampling Points					
River Quality Chemistry Sampling Points					
Substantiated Pollution Incident Register	pg 9				1
Water Abstractions	pg 10			1	1 (*6)
Water Industry Act Referrals	pg 11			1	
Groundwater Vulnerability	pg 12	Yes	n/a	n/a	n/a
Drift Deposits			n/a	n/a	n/a
Bedrock Aquifer Designations	pg 12	Yes	n/a	n/a	n/a
Superficial Aquifer Designations	pg 12	Yes	n/a	n/a	n/a
Source Protection Zones					
Extreme Flooding from Rivers or Sea without Defences	pg 12		Yes	n/a	n/a
Flooding from Rivers or Sea without Defences	pg 12		Yes	n/a	n/a
Areas Benefiting from Flood Defences	pg 12		Yes	n/a	n/a
Flood Water Storage Areas				n/a	n/a
Flood Defences	pg 12		Yes	n/a	n/a
Detailed River Network Lines	pg 12			Yes	n/a
Detailed River Network Offline Drainage					n/a

TWEEDIE EVANS CONSULTING

Summary

Data Type	Page Number	On Site	0 to 250m	251 to 500m	501 to 1000m (*up to 2000m)
Waste					
BGS Recorded Landfill Sites					
Historical Landfill Sites					
Integrated Pollution Control Registered Waste Sites					
Licensed Waste Management Facilities (Landfill Boundaries)					
Licensed Waste Management Facilities (Locations)	pg 13		1		1
Local Authority Landfill Coverage		1	n/a	n/a	n/a
Local Authority Recorded Landfill Sites					
Registered Landfill Sites					
Registered Waste Transfer Sites	pg 14		2		
Registered Waste Treatment or Disposal Sites					
Hazardous Substances					
Control of Major Accident Hazards Sites (COMAH)					
Explosive Sites					
Notification of Installations Handling Hazardous Substances (NIHHS)					
Planning Hazardous Substance Consents					
Planning Hazardous Substance Enforcements					
Geological					
BGS 1:625,000 Solid Geology	pg 15	Yes	n/a	n/a	n/a
BGS Recorded Mineral Sites	pg 15				1
Brine Compensation Area			n/a	n/a	n/a
Coal Mining Affected Areas			n/a	n/a	n/a
Mining Instability			n/a	n/a	n/a
Man-Made Mining Cavities	pg 15				1
Natural Cavities					
Non Coal Mining Areas of Great Britain	pg 15	Yes	Yes	n/a	n/a
Potential for Collapsible Ground Stability Hazards	pg 15	Yes		n/a	n/a
Potential for Compressible Ground Stability Hazards	pg 15		Yes	n/a	n/a
Potential for Ground Dissolution Stability Hazards	pg 15		Yes	n/a	n/a
Potential for Landslide Ground Stability Hazards	pg 15	Yes		n/a	n/a
Potential for Running Sand Ground Stability Hazards	pg 15	Yes	Yes	n/a	n/a
Potential for Shrinking or Swelling Clay Ground Stability Hazards	pg 16	Yes	Yes	n/a	n/a
Radon Potential - Radon Affected Areas			n/a	n/a	n/a
Radon Potential - Radon Protection Measures			n/a	n/a	n/a

TWEEDIE EVANS CONSULTING

Summary

Data Type	Page Number	On Site	0 to 250m	251 to 500m	501 to 1000m (*up to 2000m)
Industrial Land Use					
Contemporary Trade Directory Entries	pg 17	3	36	50	89
Fuel Station Entries	pg 32		1		2
Gas Pipelines					
Underground Electrical Cables					
Sensitive Land Use					
Ancient Woodland					
Areas of Adopted Green Belt					
Areas of Unadopted Green Belt					
Areas of Outstanding Natural Beauty					
Environmentally Sensitive Areas					
Forest Parks					
Local Nature Reserves					
Marine Nature Reserves	pg 33		1		
National Nature Reserves					
National Parks					
Nitrate Sensitive Areas					
Nitrate Vulnerable Zones					
Ramsar Sites					
Sites of Special Scientific Interest					
Special Areas of Conservation					
Special Protection Areas					
World Heritage Sites					

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A13NE (E)	0	1	543650 179127
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A13NE (NE)	0	1	543642 179127
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A13NW (NW)	48	1	543500 179250
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A13NE (E)	61	1	543750 179150
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A13NW (N)	61	1	543600 179300
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding to Occur at Surface	A13NE (N)	90	1	543650 179350
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A13NW (NW)	182	1	543350 179250
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A13NE (NE)	211	1	543800 179350
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A13NW (W)	232	1	543300 179250
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding to Occur at Surface	A8NE (SE)	282	1	543850 178750
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding to Occur at Surface	A13NE (NE)	322	1	543900 179400
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A12NE (W)	380	1	543150 179250
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A18SW (N)	381	1	543450 179600
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding to Occur at Surface	A8NE (S)	414	1	543642 178600
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A14SW (SE)	415	1	544100 178800
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A12SE (W)	455	1	543150 178950
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A8NE (S)	461	1	543700 178550
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding to Occur at Surface	A9NW (SE)	474	1	544050 178650

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
1	**Discharge Consents** Operator: London Borough Of Greenwich Property Type: Recreational & Cultural Location: Woolwich Leisure Centre & Carpark, Woolwich, London Authority: Environment Agency, Thames Region Catchment Area: Not Supplied Reference: Ctwc.1156 Permit Version: 1 Effective Date: 21st August 1986 Issued Date: 21st August 1986 Revocation Date: 4th October 1995 Discharge Type: Discharge Of Other Matter-Surface Water Discharge Environment: Saline Estuary Receiving Water: River Thames **Status: Authorisation revokedRevoked** Positional Accuracy: Located by supplier to within 100m	A13NW (NW)	245	2	543300 179300
2	**Discharge Consents** Operator: Waldair Court Management Company Limited Property Type: General Construction Work Location: Waldair Wharf, Bargehouse Road,London E15 Authority: Environment Agency, Thames Region Catchment Area: Not Given Reference: CTWC.1330 Permit Version: 1 Effective Date: 28th November 1986 Issued Date: 28th November 1986 Revocation Date: Not Supplied Discharge Type: Discharge Of Other Matter-Surface Water Discharge Environment: Saline Estuary Receiving Water: River Thames Tidal **Status: Varied under EPR 2010** Positional Accuracy: Located by supplier to within 100m	A18SE (N)	570	2	543700 179800
2	**Discharge Consents** Operator: Thames Water Utilities Ltd Property Type: Sewerage Network - Sewers - Water Company Location: N Woolwich P.S., Albert Roadn Woolwich P.S.Albert Road Authority: Environment Agency, Thames Region Catchment Area: Not Supplied Reference: Temp.2366 Permit Version: 2 Effective Date: 3rd September 2010 Issued Date: 3rd September 2010 Revocation Date: Not Supplied Discharge Type: Public Sewage: Storm Sewage Overflow Discharge Environment: Saline Estuary Receiving Water: Tidal Thames **Status: Varied under EPR 2010** Positional Accuracy: Located by supplier to within 10m	A18SE (N)	576	2	543730 179800
2	**Discharge Consents** Operator: Thames Water Utilities Ltd Property Type: Sewerage Network - Sewers - Water Company Location: N Woolwich P.S., Albert Roadn Woolwich P.S.Albert Road Authority: Environment Agency, Thames Region Catchment Area: Not Supplied Reference: Temp.2366 Permit Version: 1 Effective Date: 2nd November 1989 Issued Date: 2nd November 1989 Revocation Date: 2nd September 2010 Discharge Type: Public Sewage: Storm Sewage Overflow Discharge Environment: Saline Estuary Receiving Water: Tidal Thames **Status: Temporary Consents (Water Act 1989, Section 113)** Positional Accuracy: Located by supplier to within 10m	A18SE (N)	576	2	543730 179800

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
2	**Discharge Consents** Operator: Thames Water Utilities Limited. Property Type: Sewerage Network - Sewers - Water Company Location: Albert Road Sewer, London Authority: Environment Agency, Thames Region Catchment Area: Not Given Reference: CSAB.0523 Permit Version: 1 Effective Date: 5th October 1987 Issued Date: 5th October 1987 Revocation Date: Not Supplied Discharge Type: Sewage Discharges - Stw Storm Overflow/Storm Tank - Water Company Discharge Environment: Saline Estuary Receiving Water: R.Thames (Tidal) **Status:** **Post National Rivers Authority Legislation where issue date > 31/08/1989** Positional Accuracy: Located by supplier to within 10m	A18SE (N)	576	2	543730 179800
2	**Discharge Consents** Operator: Thames Water Utilities Ltd Property Type: Sewerage Network - Sewers - Water Company Location: Woolwich Manorway Authority: Environment Agency, Thames Region Catchment Area: Not Supplied Reference: Temp.3043 Permit Version: 2 Effective Date: 3rd September 2010 Issued Date: 3rd September 2010 Revocation Date: Not Supplied Discharge Type: Public Sewage: Storm Sewage Overflow Discharge Environment: Freshwater Stream/River Receiving Water: Woolwich Reach **Status:** **Temporary Consents (Water Act 1989, Section 113)** Positional Accuracy: Located by supplier to within 10m	A18NE (N)	603	2	543720 179830
2	**Discharge Consents** Operator: Thames Water Utilities Ltd Property Type: Sewerage Network - Sewers - Water Company Location: Woolwich Manorway Authority: Environment Agency, Thames Region Catchment Area: Not Supplied Reference: Temp.3043 Permit Version: 1 Effective Date: 2nd November 1989 Issued Date: 2nd November 1989 Revocation Date: 2nd September 2010 Discharge Type: Public Sewage: Storm Sewage Overflow Discharge Environment: Freshwater Stream/River Receiving Water: Woolwich Reach **Status:** **Temporary Consents (Water Act 1989, Section 113)** Positional Accuracy: Located by supplier to within 10m	A18NE (N)	603	2	543720 179830
3	**Discharge Consents** Operator: Thames Water Utilities Limited. Property Type: Sewerage Network - Pumping Station - Water Company Location: North Woolwich Pumping Station Storm Overflow, London Authority: Environment Agency, Thames Region Catchment Area: Not Given Reference: CSSC.9966 Permit Version: 1 Effective Date: 11th February 1988 Issued Date: 11th February 1988 Revocation Date: Not Supplied Discharge Type: Public Sewage: Storm Sewage Overflow Discharge Environment: Saline Estuary Receiving Water: Tidal River Thames **Status:** **Transferred from COPA 1974** Positional Accuracy: Located by supplier to within 10m	A17SE (NW)	621	2	543200 179740

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
4	**Discharge Consents** Operator: Amec Plc Property Type: General Construction Work Location: Marlborough Road Off Armstrong Road Woolwich London Se18 6re Authority: Environment Agency, Thames Region Catchment Area: Not Supplied Reference: Casm.1486 Permit Version: 2 Effective Date: 28th February 2008 Issued Date: 28th February 2008 Revocation Date: 1st October 2008 Discharge Type: Trade Effluent Discharge-Site Drainage Discharge Environment: Saline Estuary Receiving Water: The Thames Estuary **Status: New Consent (Water Resources Act 1991, Section 88 & Schedule 10 as amended by Environment Act 1995)** Positional Accuracy: Located by supplier to within 10m	A19SW (NE)	637	2	544210 179490
4	**Discharge Consents** Operator: Amec Plc Property Type: General Construction Work Location: Marlborough Road Off Armstrong Road Woolwich London Se18 6re Authority: Environment Agency, Thames Region Catchment Area: Not Supplied Reference: Casm.1486 Permit Version: 1 Effective Date: 10th August 2006 Issued Date: 19th September 2006 Revocation Date: 27th February 2008 Discharge Type: Trade Effluent Discharge-Site Drainage Discharge Environment: Saline Estuary Receiving Water: The Thames Estuary **Status: New Consent (Water Resources Act 1991, Section 88 & Schedule 10 as amended by Environment Act 1995)** Positional Accuracy: Located by supplier to within 10m	A19SW (NE)	637	2	544210 179490
5	**Discharge Consents** Operator: London Borough Of Greenwich Property Type: Domestic Property (Multiple) Location: Magistrates Court Housing Site,Leda Road, London Authority: Environment Agency, Thames Region Catchment Area: Not Supplied Reference: Cntw.0350 Permit Version: 1 Effective Date: 7th March 1990 Issued Date: 7th March 1990 Revocation Date: 18th August 1994 Discharge Type: Discharge Of Other Matter-Surface Water Discharge Environment: Saline Estuary Receiving Water: River Thames **Status: Authorisation revokedRevoked** Positional Accuracy: Located by supplier to within 10m	A12NW (W)	684	2	542850 179300
6	**Discharge Consents** Operator: Thames Water Utilities Ltd Property Type: Sewerage Network - Sewers - Water Company Location: Henley Road Authority: Environment Agency, Thames Region Catchment Area: Not Supplied Reference: Temp.2679 Permit Version: 2 Effective Date: 3rd September 2010 Issued Date: 3rd September 2010 Revocation Date: Not Supplied Discharge Type: Public Sewage: Storm Sewage Overflow Discharge Environment: Freshwater Stream/River Receiving Water: Woolwich Reach **Status: Varied under EPR 2010** Positional Accuracy: Located by supplier to within 10m	A17SW (NW)	793	2	542920 179720

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
6	**Discharge Consents** Operator: Thames Water Utilities Ltd Property Type: Sewerage Network - Sewers - Water Company Location: Henley Road Authority: Environment Agency, Thames Region Catchment Area: Not Supplied Reference: Temp.2679 Permit Version: 1 Effective Date: 2nd November 1989 Issued Date: 2nd November 1989 Revocation Date: 2nd September 2010 Discharge Type: Public Sewage: Storm Sewage Overflow Discharge Environment: Freshwater Stream/River Receiving Water: Woolwich Reach **Status: Temporary Consents (Water Act 1989, Section 113)** Positional Accuracy: Located by supplier to within 10m	A17SW (NW)	793	2	542920 179720
6	**Discharge Consents** Operator: Thames Water Utilities Limited. Property Type: Sewerage Network - Sewers - Water Company Location: Albert Road Sewer, London Authority: Environment Agency, Thames Region Catchment Area: Not Given Reference: CSAB.0529 Permit Version: 1 Effective Date: 5th October 1987 Issued Date: 5th October 1987 Revocation Date: Not Supplied Discharge Type: Sewage Discharges - Stw Storm Overflow/Storm Tank - Water Company Discharge Environment: Saline Estuary Receiving Water: R.Thames (Tidal) **Status: Post National Rivers Authority Legislation where issue date > 31/08/1989** Positional Accuracy: Located by supplier to within 10m	A17SW (NW)	806	2	542920 179740
7	**Discharge Consents** Operator: Amec Group Limited & Amec Spie Rail (Uk) Limited Property Type: Railway & Tram Vehicles Location: Docklands Light Railway Nwtc Jv Royal Docks Off Woolwich Manor Way North Woolwich London E16 2pb Authority: Environment Agency, Thames Region Catchment Area: Non-Tidal (River Roding) Reference: Canm.1005 Permit Version: 1 Effective Date: 1st December 2005 Issued Date: 7th December 2005 Revocation Date: 11th October 2006 Discharge Type: Trade Discharges - Site Drainage (Contam Surface Water, Not Tips) Discharge Environment: Into Land Receiving Water: To Land Via Boreholes **Status: Revoked (Water Resources Act 1991, Section 88 & Schedule 10 as amended by Environment Act 1995)** Positional Accuracy: Located by supplier to within 10m	A23SW (N)	912	2	543550 180150
8	**Discharge Consents** Operator: Amec Group Ltd & Amec Spie Rail (Uk) Ltd Property Type: Railways Location: Royal Docks Off Woolwich Manor Way North Woolwich London E16 2pb Authority: Environment Agency, Thames Region Catchment Area: Non-Tidal (River Roding) Reference: Canm.1032 Permit Version: 1 Effective Date: 13th January 2006 Issued Date: 17th January 2006 Revocation Date: 11th October 2006 Discharge Type: Trade Discharge - Process Water Discharge Environment: Into Land Receiving Water: Ground Waters Via Rech Bholes **Status: Revoked (Water Resources Act 1991, Section 88 & Schedule 10 as amended by Environment Act 1995)** Positional Accuracy: Located by supplier to within 100m	A23SW (N)	961	2	543600 180200

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
9	**Prosecutions Relating to Controlled Waters** Location: Store Road Pumping Station, Store Road, LONDON, E16 2EH Prosecution Text: EA Data 08/02/2000, Polluting the River Thames with undiluted sewage at North Woolwich due to an electrical failure in the pumping station causing the storm pump to come online. Prosecution Act: WRA91 s85(3a) Hearing Date: 3rd February 2000 Verdict: Guilty Fine: 5000 Cost: 700 Positional Accuracy: Manually positioned to the address or location	A17NE (NW)	794	2	543091 179875
10	**Local Authority Pollution Prevention and Controls** Name: Shell Woolwich Petrol Filling Station Location: 125-127 Woolwich High Street, Woolwich, London, SE18 6DN Authority: London Borough of Greenwich, Environmental Health Department Permit Reference: Lbg 227/A Dated: 20th January 1999 Process Type: Local Authority Air Pollution Control Description: PG1/14 Petrol filling station **Status: Authorised** Positional Accuracy: Automatically positioned to the address	A12NE (W)	240	3	543291 179173
11	**Local Authority Pollution Prevention and Controls** Name: Woolwich Express Location: 59 Woolwich New Road, London, Se18 6ed Authority: London Borough of Greenwich, Environmental Health Department Permit Reference: 312 Dated: Not Supplied Process Type: Local Authority Pollution Prevention and Control Description: PG6/46 Dry cleaning **Status: Permitted** Positional Accuracy: Manually positioned to the address or location	A8NE (S)	289	3	543657 178736
12	**Local Authority Pollution Prevention and Controls** Name: T & T Launderette And Dry Cleaners Location: 9 Anglesea Road, Se18 6eg Authority: London Borough of Greenwich, Environmental Health Department Permit Reference: 331 Dated: Not Supplied Process Type: Local Authority Pollution Prevention and Control Description: PG6/46 Dry cleaning **Status: Permitted** Positional Accuracy: Manually positioned to the address or location	A8NE (S)	364	3	543646 178661
13	**Local Authority Pollution Prevention and Controls** Name: W J King (Garages) Ltd Location: 40 Artillery Place, Woolwich, London, SE18 4AE Authority: London Borough of Greenwich, Environmental Health Department Permit Reference: 230 Dated: 20th January 1999 Process Type: Local Authority Air Pollution Control Description: PG1/14 Petrol filling station **Status: Authorised** Positional Accuracy: Manually positioned to the address or location	A7NE (SW)	738	3	543130 178548
13	**Local Authority Pollution Prevention and Controls** Name: Wj King (Garages) Ltd Location: 40 Artillery Place, Woolwich, LONDON, SE18 1SF Authority: London Borough of Greenwich, Environmental Health Department Permit Reference: 127 Dated: 23rd May 1996 Process Type: Local Authority Air Pollution Control Description: PG6/34 Respraying of road vehicles **Status: Authorised** Positional Accuracy: Manually positioned to the address or location	A7NE (SW)	739	3	543128 178549
14	**Local Authority Pollution Prevention and Controls** Name: Tills Petrol Filling Station Location: 79 Sandy Hill Road, Woolwich, LONDON, SE18 7BQ Authority: London Borough of Greenwich, Environmental Health Department Permit Reference: Lbg 228/A Dated: 20th January 1999 Process Type: Local Authority Air Pollution Control Description: PG1/14 Petrol filling station **Status: Authorised** Positional Accuracy: Automatically positioned to the address	A8SE (S)	781	3	543778 178231

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
15	**Local Authority Pollution Prevention and Controls** Name: 2in1 Dry Cleaners Location: 6 Pier Parade, London, E16 2ly Authority: London Borough of Newham, Environmental Health Department Permit Reference: LA-PPC 124/11 Dated: 1st April 2011 Process Type: Local Authority Pollution Prevention and Control Description: PG6/46 Dry cleaning **Status: Permitted** Positional Accuracy: Manually positioned to the address or location	A17NE (NW)	860	4	543264 180039
16	**Local Authority Pollution Prevention and Controls** Name: King'S Troop Royal Horse Artillery Location: Napier Lines, Artillery Road, Woolwich, Se18 4bb Authority: London Borough of Greenwich, Environmental Health Department Permit Reference: 154 Dated: Not Supplied Process Type: Local Authority Pollution Prevention and Control Description: Part B - General Waste Disposal Process (No Specific Reference) **Status: Application Not Yet Authorised** Positional Accuracy: Manually positioned to the address or location	A7NW (SW)	916	3	542954 178475
17	**Local Authority Pollution Prevention and Controls** Name: Unique Dry Cleaners Location: 6 Frances Street, Woolwich, Se18 5ef Authority: London Borough of Greenwich, Environmental Health Department Permit Reference: 322 Dated: Not Supplied Process Type: Local Authority Pollution Prevention and Control Description: PG6/46 Dry cleaning **Status: Permitted** Positional Accuracy: Manually positioned to the address or location	A7NW (SW)	942	3	542873 178525
	Nearest Surface Water Feature	A13NW (N)	109	-	543611 179352
18	**Pollution Incidents to Controlled Waters** Property Type: Not Given Location: Woolwich Reach Authority: Environment Agency, Thames Region Pollutant: Oils - Unknown Note: Confirmed As A Pollution Incident Incident Date: Not Supplied Incident Reference: SE940006 Catchment Area: Not Given Receiving Water: Not Given Cause of Incident: Not Given Incident Severity: Category 3 - Minor Incident Positional Accuracy: Located by supplier to within 100m	A19SW (NE)	461	2	544000 179500
19	**Pollution Incidents to Controlled Waters** Property Type: Not Given Location: Woolwich Arsenal Authority: Environment Agency, Thames Region Pollutant: Oils - Unknown Note: Confirmed As A Pollution Incident Incident Date: 29th October 1993 Incident Reference: SE930331 Catchment Area: Not Given Receiving Water: Not Given Cause of Incident: Not Given Incident Severity: Category 2 - Significant Incident Positional Accuracy: Located by supplier to within 100m	A19SW (NE)	542	2	544100 179495
19	**Pollution Incidents to Controlled Waters** Property Type: Not Given Location: Woolwich Arsenal Authority: Environment Agency, Thames Region Pollutant: Oils - Unknown Note: Confirmed As A Pollution Incident Incident Date: 24th October 1993 Incident Reference: SE930323 Catchment Area: Not Given Receiving Water: Not Given Cause of Incident: Not Given Incident Severity: Category 3 - Minor Incident Positional Accuracy: Located by supplier to within 100m	A19SW (NE)	544	2	544100 179500

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
19	**Pollution Incidents to Controlled Waters** Property Type: Not Given Location: Woolwich Arsenal Authority: Environment Agency, Thames Region Pollutant: Miscellaneous - Unknown Note: Confirmed As A Pollution Incident Incident Date: 16th February 1994 Incident Reference: SE940043 Catchment Area: Not Given Receiving Water: Not Given Cause of Incident: Not Given Incident Severity: Category 3 - Minor Incident Positional Accuracy: Located by supplier to within 100m	A19SW (NE)	546	2	544105 179495
20	**Pollution Incidents to Controlled Waters** Property Type: Not Given Location: Woolwich Ferry Authority: Environment Agency, Thames Region Pollutant: Oils - Unknown Note: Confirmed As A Pollution Incident Incident Date: 19th October 1994 Incident Reference: SE940347 Catchment Area: Not Given Receiving Water: Not Given Cause of Incident: Not Given Incident Severity: Category 3 - Minor Incident Positional Accuracy: Located by supplier to within 100m	A12NE (NW)	561	2	543000 179400
21	**Pollution Incidents to Controlled Waters** Property Type: Not Given Location: Woolwich Ferry Authority: Environment Agency, Thames Region Pollutant: Oils - Unknown Note: Confirmed As A Pollution Incident Incident Date: 20th May 1995 Incident Reference: SE950224 Catchment Area: Not Given Receiving Water: Not Given Cause of Incident: Not Given Incident Severity: Category 2 - Significant Incident Positional Accuracy: Located by supplier to within 100m	A12SE (W)	566	2	543000 179000
22	**Pollution Incidents to Controlled Waters** Property Type: Not Given Location: SILVERTOWN Authority: Environment Agency, Thames Region Pollutant: Oils - Unknown Note: Not Supplied Incident Date: 13th May 1996 Incident Reference: SE960201 Catchment Area: Not Given Receiving Water: Not Given Cause of Incident: Not Given Incident Severity: Category 3 - Minor Incident Positional Accuracy: Located by supplier to within 100m	A17SE (NW)	618	2	543150 179700
23	**Pollution Incidents to Controlled Waters** Property Type: Not Given Location: NORTH WOOLWICH Authority: Environment Agency, Thames Region Pollutant: Oils - Unknown Note: Confirmed As A Pollution Incident Incident Date: 28th July 1995 Incident Reference: SE950326 Catchment Area: Not Given Receiving Water: Not Given Cause of Incident: Not Given Incident Severity: Category 2 - Significant Incident Positional Accuracy: Located by supplier to within 100m	A17SW (NW)	739	2	542900 179600
24	**Pollution Incidents to Controlled Waters** Property Type: Not Given Location: Thamesmead West Authority: Environment Agency, Thames Region Pollutant: Oils - Unknown Note: Confirmed As A Pollution Incident Incident Date: 12th October 1994 Incident Reference: SE940341 Catchment Area: Not Given Receiving Water: Not Given Cause of Incident: Not Given Incident Severity: Category 3 - Minor Incident Positional Accuracy: Located by supplier to within 100m	A14NE (E)	941	2	544600 179400

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
25	**Registered Radioactive Substances** Name: University Of Greenwich Location: Woolwich Campus, Wellington Street, WOOLWICH, LONDON, SE18 6PF Authority: Environment Agency, Thames Region Permit Reference: Bw7929 Dated: 1st December 2003 Process Type: Authorisation under S13 RSA for the disposal of Radioactive waste (was RSA60 S7) Description: Minor variation to authorisation under RSA **Status: Authorisation either revoked or cancelledCancelled** Positional Accuracy: Automatically positioned to the address	A13SW (S)	273	2	543530 178812
25	**Registered Radioactive Substances** Name: University Of Greenwich Location: Woolwich Campus, Wellington Street, Woolwich, LONDON, SE18 6PF Authority: Environment Agency, Thames Region Permit Reference: AD6935 Dated: 31st March 1991 Process Type: Authorisation under S13 RSA for the disposal of Radioactive waste (was RSA60 S7) Description: Authorisation under RSA **Status: Authorisation superseded by a substantial or non substantial variationSuperseded** Positional Accuracy: Automatically positioned to the address	A13SW (S)	273	2	543530 178812
25	**Registered Radioactive Substances** Name: University Of Greenwich Location: Woolwich Campus, Wellington Street, LONDON, Greater London, SE18 6PF Authority: Environment Agency, Thames Region Permit Reference: AP0739 Dated: 25th May 1995 Process Type: Authorisation under S13 RSA for the disposal of Radioactive waste (was RSA60 S7) Description: Substantial variation to authorisation under RSA **Status: Authorisation superseded by a substantial or non substantial variationSuperseded** Positional Accuracy: Automatically positioned to the address	A13SW (S)	274	2	543535 178807
26	**Registered Radioactive Substances** Name: Le(A) Reme Units Location: Woolwich Garrison, Repositry Road, Woolwich, LONDON, Greater London, SE18 4QA Authority: Environment Agency, Thames Region Permit Reference: AB9836 Dated: 21st August 1992 Process Type: Authorisation under S13 RSA for the disposal of Radioactive waste (was RSA60 S7) Description: Authorisation under RSA **Status: Authorisation either revoked or cancelledCancelled** Positional Accuracy: Unknown	A7SE (SW)	821	2	543138 178424
27	**Registered Radioactive Substances** Name: Ministry Of Defence Location: Royal Artillery Training Area, Woolwich Garrison, Woolwich, London, Se18 6xr Authority: Environment Agency, Thames Region Permit Reference: Bw8054 Dated: 1st December 2003 Process Type: Authorisation under S13 RSA for the disposal of Radioactive waste (was RSA60 S7) Description: Minor variation to authorisation under RSA **Status: Authorisation either revoked or cancelledCancelled** Positional Accuracy: Manually positioned within the geographical locality	A7NW (SW)	958	2	542884 178490
28	**Substantiated Pollution Incident Register** Authority: Environment Agency - Thames Region, South East Area Incident Date: 21st October 2007 Incident Reference: 539952 Water Impact: Category 2 - Significant Incident Air Impact: Category 4 - No Impact Land Impact: Category 4 - No Impact Positional Accuracy: Located by supplier to within 10m Pollutant: Pollutant Not Identified: Not Identified	A12NW (W)	714	2	542815 179236

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
29	**Water Abstractions** Operator: London Borough Of Greenwich Licence Number: 28/39/44/0018 Permit Version: Not Supplied Location: Woolwich Baths, Woolwich, LONDON, Se18 Authority: Environment Agency, Thames Region Abstraction: Domestic Use Only Abstraction Type: Not Supplied Source: Groundwater Daily Rate (m3): 614 Yearly Rate (m3): 31822 Details: Chalk (Undifferentiated) Authorised Start: Not Supplied Authorised End: Not Supplied Permit Start Date: Not Supplied Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 100m	A13SW (SW)	369	2	543400 178800
30	**Water Abstractions** Operator: Amec Group Ltd Licence Number: 28/39/45/0014 Permit Version: 1 Location: River Thames At East End Of King George V Dock, London E16 Authority: Environment Agency, Thames Region Abstraction: Construction: General use relating to Secondary Category (Low Loss) Abstraction Type: Water may be abstracted from a single point Source: Tidal Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Adjacent To King George V Dock Authorised Start: 01 January Authorised End: 31 December Permit Start Date: 25th November 2005 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A23SW (N)	953	2	543540 180190
	Water Abstractions Operator: T & L Sugars Limited Licence Number: 28/39/45/0006 Permit Version: 103 Location: River Thames At Thames Refinery, Silvertown, London E16 Authority: Environment Agency, Thames Region Abstraction: Food And Drink: Non-Evaporative Cooling Abstraction Type: Water may be abstracted from a single point Source: Tidal Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Thames Refinery, Silvertown, London E16 Authorised Start: 01 January Authorised End: 31 December Permit Start Date: 9th September 2010 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 100m	A16SE (NW)	1362	2	542300 179800
	Water Abstractions Operator: Tate & Lyle Sugars Licence Number: 28/39/45/0006 Permit Version: 102 Location: River Thames At Thames Refinery, Silvertown, London E16 Authority: Environment Agency, Thames Region Abstraction: Food And Drink: Non-Evaporative Cooling Abstraction Type: Water may be abstracted from a single point Source: Tidal Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Thames Refinery, Silvertown, London E16 Authorised Start: 01 January Authorised End: 31 December Permit Start Date: 2nd February 2010 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 100m	A16SE (NW)	1362	2	542300 179800

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	Water Abstractions Operator: Tate & Lyle Sugars Licence Number: 28/39/45/0006 Permit Version: 101 Location: River Thames At Thames Refinery, Silvertown, London E16 Authority: Environment Agency, Thames Region Abstraction: Food And Drink: Non-Evaporative Cooling Abstraction Type: Water may be abstracted from a single point Source: Tidal Daily Rate (m3): 60916 Yearly Rate (m3): 16365600 Details: Thames Refinery, Silvertown, London E16 Authorised Start: 01 January Authorised End: 31 December Permit Start Date: 29th July 1999 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 100m	A16SE (NW)	1362	2	542300 179800
	Water Abstractions Operator: T & L Sugars Limited Licence Number: 28/39/45/0006 Permit Version: 103 Location: River Thames At Thames Refinery, Silvertown, London E16. Authority: Environment Agency, Thames Region Abstraction: Food And Drink: Non-Evaporative Cooling Abstraction Type: Water may be abstracted from a single point Source: Tidal Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Thames Refinery, Silvertown, London E16 Authorised Start: 01 January Authorised End: 31 December Permit Start Date: 9th September 2010 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A16SW (W)	1470	2	542154 179733
	Water Abstractions Operator: European Colour (Pigments) Ltd Licence Number: 28/39/44/0034 Permit Version: 101 Location: Nathan Way, West Thamesmead Business Park - Borehole 'A' Authority: Environment Agency, Thames Region Abstraction: Other Industrial/Commercial/Public Services: General Use (Medium Loss) Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Nathan Way, West Thamesmead Business Park, London Authorised Start: 01 January Authorised End: 31 December Permit Start Date: 12th December 2000 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	(E)	1857	2	545580 179280
	Water Abstractions Operator: European Colour (Pigments) Ltd Licence Number: 28/39/44/0034 Permit Version: 100 Location: Nathan Way, West Thamesmead Business Park - Borehole 'A' Authority: Environment Agency, Thames Region Abstraction: Other Industrial/Commercial/Public Services: General Use (Medium Loss) Abstraction Type: Not Supplied Source: Groundwater Daily Rate (m3): 750 Yearly Rate (m3): 200000 Details: Nathan Way, West Thamesmead Business Park, London Authorised Start: 01 January Authorised End: 31 December Permit Start Date: 9th March 1998 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 100m	(E)	1857	2	545580 179280
31	**Water Industry Act Referrals** Name: Thames Polytechnic Location: THAMES POLYTECHNIC, WELLINGTON STREET, WELLINGTON STREET, WOOLWICH, LONDON, SE18 4BG Authority: Environment Agency, Thames Region Permit Reference: AF0512 Dated: 31st March 1992 Process Type: Permissions or amendments to discharge under the Water Industry Act 1991 Description: Processes which result in the discharge of Special Category effluents under The Trade Effluents (Prescribed Processes and Substances) Regulations **Status: Application cancelled** Positional Accuracy: Automatically positioned to the address	A13SW (S)	266	2	543535 178817

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	Groundwater Vulnerability Soil Classification: Soils of High Leaching Potential (U) - Soil information for restored mineral workings and urban areas is based on fewer observations than elsewhere. A worst case vulnerability classification (H) assumed, until proved otherwise Map Sheet: Sheet 40 Thames Estuary Scale: 1:100,000	A13NE (NE)	0	2	543642 179127
	Drift Deposits None				
	Bedrock Aquifer Designations Aquifer Designation: Secondary Aquifer - A	A13NE (NE)	0	1	543642 179127
	Superficial Aquifer Designations Aquifer Designation: Secondary Aquifer - Undifferentiated	A13NE (NE)	0	1	543642 179127
	Extreme Flooding from Rivers or Sea without Defences Type: Extent of Extreme Flooding from Rivers or Sea without Defences Flood Plain Type: Tidal Models Boundary Accuracy: As Supplied	A13NE (N)	65	2	543717 179314
	Flooding from Rivers or Sea without Defences Type: Extent of Flooding from Rivers or Sea without Defences Flood Plain Type: Tidal Models Boundary Accuracy: As Supplied	A13NE (N)	77	2	543717 179314
	Areas Benefiting from Flood Defences Type: Area Benefiting from Flood Defences Boundary Accuracy: As Supplied	A13NW (NW)	65	2	543483 179258
	Areas Benefiting from Flood Defences Type: Area Benefiting from Flood Defences Boundary Accuracy: As Supplied	A13NE (N)	126	2	543714 179318
	Areas Benefiting from Flood Defences Type: Area Benefiting from Flood Defences Boundary Accuracy: As Supplied	A13NW (NW)	171	2	543380 179298
	Flood Water Storage Areas None				
	Flood Defences Type: Flood Defences Reference: Not Supplied	A13NW (NW)	51	2	543530 179272
32	**Detailed River Network Lines** River Type: Down stream of High Water Mark River Name: Not Supplied Hydrographic Area: D006 River Flow Type: Primary Flow Path River Surface Level: Surface Drain Feature: Not a Drain Flood Risk Management Status: Flood Risk Management Indicative/Statutory Main River Water Course Name: Thames (Tidal) Water Course Reference: TH00	A18SW (N)	329	2	543593 179570
	Detailed River Network Offline Drainage None				

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
33	**Licensed Waste Management Facilities (Locations)** Licence Number: 83241 Location: 6-14 Beresford Street, Woolwich, London, SE18 6BE Operator Name: Greenwich London Borough Council Operator Location: Not Supplied Authority: Environment Agency - South East Region, Kent & South London Area Site Category: Household, Commercial And Industrial Transfer Stations **Licence Status: Surrendered** Issued: 16th April 1992 Last Modified: 4th September 1995 Expires: Not Supplied Suspended: Not Supplied Revoked: Not Supplied Surrendered: 28th February 2009 IPPC Reference: Not Supplied Positional Accuracy: Located by supplier to within 10m	A13SE (S)	24	2	543661 179027
34	**Licensed Waste Management Facilities (Locations)** Licence Number: 103174 Location: Unit 6 & 7 Standard Ind Est, Factory Road, Silvertow Operator Name: London City Metals Ltd Operator Location: Not Supplied Authority: Environment Agency - Thames Region, North East Area Site Category: Metal recycling site **Licence Status: Issued** Issued: 19th August 2011 Last Modified: Not Supplied Expires: Not Supplied Suspended: Not Supplied Revoked: Not Supplied Surrendered: Not Supplied IPPC Reference: Not Supplied Positional Accuracy: Located by supplier to within 100m	A17NW (NW)	931	2	542881 179881
	Local Authority Landfill Coverage Name: London Borough of Greenwich - Has supplied landfill data		0	3	543642 179127
	Local Authority Landfill Coverage Name: London Borough of Newham - Has supplied landfill data		279	5	543553 179517

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
35	**Registered Waste Transfer Sites** Licence Holder: L.B. of Greenwich Licence Reference: DL125 Site Location: Market Traders Compound, 6-14 Beresford Street, WOOLWICH, London, SE18 Operator Location: 50 Woolwich New Road, GREENWICH, London, SE18 6HQ Authority: Environment Agency - Thames Region, South East Area Site Category: Transfer Max Input Rate: Small (Equal to or greater than 10,000 and less than 25,000 tonnes per year) Waste Source Restrictions: No known restriction on source of waste Licence Status: Operational as far as is knownOperational Dated: 16th April 1992 Preceded By Licence: DL125 Superseded By Licence: Not Given Positional Accuracy: Manually positioned to the address or location Boundary Quality: Not Supplied Authorised Waste: Calcium Carb/Sulphate(Gypsum)/Chloride Cardboard/Fibreboard Cement Cork,Ebonite,Kapok Decontam.Containers (< 50 L Cap.) Iron,Steel,Alum.Brass,Copper,Tin,Zinc Leather Lwra Cat. Bi Gen.Non-Putresc. Namely Lwra Cat. C 'Putresc' Namely Magnesium Carb. Max.Waste Permitted By Licence-Stated Paper (Incl. Oiled/Tarred) Plasterboard Plastics (Finished Prods/Manuf.Scrap) String,Rope,Fibre(Manmade/Natural) Wood (Incl. Saw/Sanderdust) Wood Prods (Incl.Chip/Fibreboard) Wool,Cotton,Linen,Hemp,Sisal,Hessian Prohibited Waste: Clinical - As In Coll/Disp.Regs Of '88 Leather Proc'G Waste Metal Swarf,Dusts,Particulate Noxious, Poisoning, Polluting Sub'S P.F.A. & Vanadium Contam. Ash Sludges/Liquids Special Wastes Toxic Metal Slags	A13SE (S)	36	2	543655 179015
35	**Registered Waste Transfer Sites** Licence Holder: L.B. of Greenwich Licence Reference: DL125 Site Location: Market Traders Compound, 6-14 Beresford Street, WOOLWICH, London, SE18 Operator Location: 50 Woolwich Nw Road, GREENWICH, London, SE18 6HQ Authority: Environment Agency - Thames Region, South East Area Site Category: Transfer Max Input Rate: Very Small (Less than 10,000 tonnes per year) Waste Source Restrictions: No known restriction on source of waste Licence Status: Record supersededSuperseded Dated: 1st June 1983 Preceded By Licence: Not Given Superseded By Licence: DL125 Positional Accuracy: Manually positioned to the address or location Boundary Quality: Not Supplied Authorised Waste: Commercial Waste From Street Market Prohibited Waste: Clinical Wastes Notifiable Wastes Special Wastes	A13SE (S)	36	2	543655 179015

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	BGS 1:625,000 Solid Geology Description: Thanet Sand Formation	A13NE (NE)	0	1	543642 179127
36	**BGS Recorded Mineral Sites** Site Name: Arthur Street Brick Field Location: , Plumstead, Woolwich, London, Greater London Source: British Geological Survey, National Geoscience Information Service Reference: 130851 Type: Opencast **Status: Ceased** Operator: Unknown Operator Operator Location: Unknown Operator Periodic Type: Palaeocene Geology: Lambeth Group Commodity: Common Clay and Shale Positional Accuracy: Located by supplier to within 10m	A9NW (SE)	647	1	544262 178625
	Coal Mining Affected Areas In an area that might not be affected by coal mining				
	Man-Made Mining Cavities Easting: 544200 Northing: 178600 Distance: 615 Quadrant Reference: A9 Quadrant Reference: NW Bearing Ref: SE Cavity Type: Historical Brick Works-Potential Chalk Mining Commodity: Chalk Solid Geology Detail: Lambeth Group, Thanet Sand Formation, Upper Chalk Formation Superficial Geology Detail: Worked Ground	A9NW (SE)	615	6	544200 178600
	Non Coal Mining Areas of Great Britain Risk: Rare Source: British Geological Survey, National Geoscience Information Service	A13NE (NE)	0	1	543642 179127
	Non Coal Mining Areas of Great Britain Risk: Rare Source: British Geological Survey, National Geoscience Information Service	A13NE (NE)	100	1	543746 179276
	Potential for Collapsible Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13NE (NE)	0	1	543642 179127
	Potential for Collapsible Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13NE (NE)	100	1	543746 179276
	Potential for Compressible Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13NE (NE)	0	1	543642 179127
	Potential for Compressible Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13NE (E)	9	1	543693 179147
	Potential for Compressible Ground Stability Hazards Hazard Potential: Moderate Source: British Geological Survey, National Geoscience Information Service	A13NW (N)	124	1	543612 179367
	Potential for Ground Dissolution Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13NE (NE)	0	1	543642 179127
	Potential for Ground Dissolution Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13NW (NW)	162	1	543495 179380
	Potential for Landslide Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13NE (NE)	0	1	543642 179127
	Potential for Running Sand Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13NE (NE)	0	1	543642 179127
	Potential for Running Sand Ground Stability Hazards Hazard Potential: Moderate Source: British Geological Survey, National Geoscience Information Service	A13NW (N)	124	1	543612 179367

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	Potential for Running Sand Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13NW (N)	149	1	543578 179390
	Potential for Running Sand Ground Stability Hazards Hazard Potential: Moderate Source: British Geological Survey, National Geoscience Information Service	A13SW (SW)	165	1	543513 178939
	Potential for Shrinking or Swelling Clay Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13NE (NE)	0	1	543642 179127
	Potential for Shrinking or Swelling Clay Ground Stability Hazards Hazard Potential: Low Source: British Geological Survey, National Geoscience Information Service	A13NE (NE)	100	1	543746 179276
	Potential for Shrinking or Swelling Clay Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13SW (SW)	165	1	543513 178939
	Radon Potential - Radon Affected Areas Affected Area: The property is in a lower probability radon area, as less than 1% of homes are above the action level Source: British Geological Survey, National Geoscience Information Service	A13NE (NE)	0	1	543642 179127
	Radon Potential - Radon Protection Measures Protection Measure: No radon protective measures are necessary in the construction of new dwellings or extensions Source: British Geological Survey, National Geoscience Information Service	A13NE (NE)	0	1	543642 179127

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
37	**Contemporary Trade Directory Entries** Name: Molyneux Press Ltd Location: 10-12, Warren Lane, London, SE18 6BS Classification: Printers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A13NW (N)	0	-	543611 179226
37	**Contemporary Trade Directory Entries** Name: Business Innovation Centre Ltd Location: 16, Warren Lane, London, SE18 6BW Classification: Precision Engineers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A13NW (N)	0	-	543626 179203
38	**Contemporary Trade Directory Entries** Name: Kingsfisher Accident Repairs Location: Rope Yard Rails, LONDON, SE18 6BN Classification: Car Body Repairs **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A13NW (N)	0	-	543631 179177
39	**Contemporary Trade Directory Entries** Name: Site Assistant Services Location: Royal Sovereign House, 40, Beresford Street, London, SE18 6BF Classification: Commercial Cleaning Services **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A13NW (W)	32	-	543555 179128
40	**Contemporary Trade Directory Entries** Name: Rolenco Ltd Location: Riverside House, Woolwich High Street, London, SE18 6DN Classification: Freight Forwarders **Status: Inactive** Positional Accuracy: Manually positioned to the address or location	A13NW (W)	54	-	543475 179195
41	**Contemporary Trade Directory Entries** Name: White Knights Laundry Services Ltd Location: 38, MacBean Street, London, SE18 6LW Classification: Laundries & Launderettes **Status: Inactive** Positional Accuracy: Automatically positioned in the proximity of the address	A13SW (SW)	81	-	543546 179066
42	**Contemporary Trade Directory Entries** Name: Snappy Snaps Location: 2, Powis Street, London, SE18 6LF Classification: Photographic Processors **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A13SE (S)	94	-	543704 178925
42	**Contemporary Trade Directory Entries** Name: The Perfume Shop Location: 14-20, Powis Street, London, SE18 6LF Classification: Perfume Suppliers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A13SE (S)	100	-	543661 178936
42	**Contemporary Trade Directory Entries** Name: Www.Requestacleaner.Com Location: 14-16, Powis Street, London, SE18 6LF Classification: Cleaning Services - Domestic **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A13SE (S)	100	-	543661 178936
42	**Contemporary Trade Directory Entries** Name: Fads Location: 22-24, Green's End, London, SE18 6JY Classification: Wallpapers & Wall Coverings **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A13SE (S)	141	-	543701 178877
43	**Contemporary Trade Directory Entries** Name: S W S Location: 11, Beresford Square, London, SE18 6BA Classification: Domestic Appliances - Servicing, Repairs & Parts **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A13SE (SE)	108	-	543742 178903
43	**Contemporary Trade Directory Entries** Name: Shaw Clean Ltd Location: 14, Beresford Square, London, SE18 6BA Classification: Dry Cleaners **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A13SE (SE)	123	-	543752 178889

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
44	**Contemporary Trade Directory Entries** Name: Reval Ward Ltd Location: 3, Plumstead Road, London, SE18 7BZ Classification: Electrical Goods Sales, Manufacturers & Wholesalers **Status: Active** Positional Accuracy: Automatically positioned to the address	A13SE (SE)	109	-	543814 178928
44	**Contemporary Trade Directory Entries** Name: Sanco Group Location: 5, Woolwich New Road, London, SE18 6EX Classification: Commercial Cleaning Services **Status: Active** Positional Accuracy: Automatically positioned to the address	A13SE (SE)	135	-	543803 178891
45	**Contemporary Trade Directory Entries** Name: Currys Digital Location: 60, Powis Street, London, SE18 6LQ Classification: Electrical Goods Sales, Manufacturers & Wholesalers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A13SW (SW)	123	-	543563 178986
46	**Contemporary Trade Directory Entries** Name: Plumstead Rubbish Clearance Location: 111, Woolwich High Street, London, SE18 6DN Classification: Rubbish Clearance **Status: Active** Positional Accuracy: Manually positioned to the address or location	A13NW (W)	150	-	543378 179218
46	**Contemporary Trade Directory Entries** Name: Green Wellness Location: 112, Woolwich High Street, London, SE18 6DN Classification: Medical & Dental Laboratories **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A13NW (W)	153	-	543375 179218
46	**Contemporary Trade Directory Entries** Name: George Autos Location: 1 Woolwich High St, London, SE18 6DS Classification: Garage Services **Status: Inactive** Positional Accuracy: Manually positioned to the road within the address or location	A13NW (W)	173	-	543356 179226
47	**Contemporary Trade Directory Entries** Name: Electromode Location: 36-42, Hare Street, London, SE18 6LZ Classification: Domestic Appliances - Servicing, Repairs & Parts **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A13NW (W)	154	-	543385 179148
48	**Contemporary Trade Directory Entries** Name: Homey & Lewis Forwarding Location: 9, Plumstead Road, London, SE18 7BZ Classification: Freight Forwarders **Status: Inactive** Positional Accuracy: Manually positioned within the geographical locality	A13SE (SE)	189	-	543908 178919
49	**Contemporary Trade Directory Entries** Name: Bright House Location: 105, Powis Street, London, SE18 6JB Classification: Electrical Goods Sales, Manufacturers & Wholesalers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A13SW (SW)	208	-	543428 179007
50	**Contemporary Trade Directory Entries** Name: Finesse Colour Ltd Location: 5, Mortgramit Square, London, SE18 6DR Classification: Printers **Status: Active** Positional Accuracy: Automatically positioned to the address	A13NW (W)	218	-	543319 179144
50	**Contemporary Trade Directory Entries** Name: Furlongs (Motor Engineers) Ltd Location: 125-127, Woolwich High Street, London, SE18 6DS Classification: Mot Testing Centres **Status: Active** Positional Accuracy: Automatically positioned to the address	A13NW (W)	226	-	543304 179181
50	**Contemporary Trade Directory Entries** Name: A R Payne Autos Ltd Location: 125-129, Woolwich High Street, London, SE18 6DS Classification: Car Body Repairs **Status: Active** Positional Accuracy: Automatically positioned to the address	A13NW (W)	226	-	543304 179181

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
50	**Contemporary Trade Directory Entries** Name: Crawford Car Sales Location: 125-129, Woolwich High Street, London, SE18 6DS Classification: Car Dealers - Used **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A13NW (W)	226	-	543304 179181
50	**Contemporary Trade Directory Entries** Name: Approved Cars Location: 125 Woolwich High Street, London, SE18 6DS Classification: Car Dealers **Status: Inactive** Positional Accuracy: Manually positioned within the geographical locality	A12NE (W)	240	-	543291 179173
50	**Contemporary Trade Directory Entries** Name: Shell (Uk) Ltd Location: 125-127, Woolwich High Street, London, SE18 6DS Classification: Petrol Filling Stations - 24 Hour **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A12NE (W)	240	-	543291 179173
50	**Contemporary Trade Directory Entries** Name: Morgan Richards Location: 125-127, Woolwich High Street, London, SE18 6DS Classification: Garage Services **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A12NE (W)	240	-	543291 179173
50	**Contemporary Trade Directory Entries** Name: Payne Autos Location: 125-129, Woolwich High Street, London, SE18 6DS Classification: Garage Services **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A12NE (W)	240	-	543291 179173
50	**Contemporary Trade Directory Entries** Name: A.C.E Autogas Ltd Location: 160-170, Powis Street, London, SE18 6NL Classification: Garage Services **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A12NE (W)	258	-	543277 179147
51	**Contemporary Trade Directory Entries** Name: London Jag Centre Location: 31, Spray Street, London, SE18 6AP Classification: Garage Services **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A13SE (SE)	218	-	543905 178866
51	**Contemporary Trade Directory Entries** Name: Paul Smee Location: 31, Spray Street, London, SE18 6AP Classification: Garage Services **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A13SE (SE)	218	-	543905 178866
51	**Contemporary Trade Directory Entries** Name: Spray Street Autos Location: 31, Spray Street, London, SE18 6AP Classification: Garage Services **Status: Active** Positional Accuracy: Automatically positioned to the address	A13SE (SE)	218	-	543905 178866
51	**Contemporary Trade Directory Entries** Name: A1 Montys Bodyworks Location: 31, Spray Street, London, SE18 6AP Classification: Car Body Repairs **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A13SE (SE)	218	-	543905 178866
51	**Contemporary Trade Directory Entries** Name: Todd Meat Trading Co Ltd Location: 39, Spray Street, London, SE18 6AP Classification: Meat - Wholesale **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A13SE (SE)	243	-	543916 178841
51	**Contemporary Trade Directory Entries** Name: Michaels Meat Market Location: 39, Spray Street, London, SE18 6AP Classification: Meat - Wholesale **Status: Active** Positional Accuracy: Automatically positioned to the address	A13SE (SE)	243	-	543916 178841

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
52	**Contemporary Trade Directory Entries** Name: Tidy Cleaners Ltd Location: Flat 227, The Vista Building, 30, Calderwood Street, London, SE18 6JF Classification: Cleaning Services - Domestic **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A13SW (SW)	222	-	543463 178947
53	**Contemporary Trade Directory Entries** Name: Kall Kwik Location: 23, Thomas Street, London, SE18 6HU Classification: Printers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A13SW (S)	228	-	543538 178863
54	**Contemporary Trade Directory Entries** Name: Pest Control (Woolwich) Location: 529 Woolwich New Rd, London, SE18 6ED Classification: Pest & Vermin Control **Status: Active** Positional Accuracy: Manually positioned to the road within the address or location	A13SE (S)	231	-	543680 178789
55	**Contemporary Trade Directory Entries** Name: Bluevision Services (Uk) Ltd Location: C, 1, Parry Place, London, SE18 6AN Classification: Freight Forwarders **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A13SE (SE)	239	-	543952 178896
55	**Contemporary Trade Directory Entries** Name: Varietes Domestic Service Location: 22, Plumstead Road, London, SE18 7BZ Classification: Domestic Appliances - Servicing, Repairs & Parts **Status: Active** Positional Accuracy: Automatically positioned to the address	A13SE (SE)	251	-	543970 178905
55	**Contemporary Trade Directory Entries** Name: Widescope International Location: 22, Plumstead Road, London, SE18 7BZ Classification: Freight Forwarders **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A13SE (SE)	251	-	543970 178905
55	**Contemporary Trade Directory Entries** Name: Clemenchi Ltd Location: 22, Plumstead Road, LONDON, SE18 7BZ Classification: Commercial Cleaning Services **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A13SE (SE)	251	-	543970 178905
55	**Contemporary Trade Directory Entries** Name: Compliance Impact Ltd Location: 22, Plumstead Road, LONDON, SE18 7BZ Classification: Hygiene & Cleansing Services **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A13SE (SE)	251	-	543970 178905
55	**Contemporary Trade Directory Entries** Name: Tompkins Service Location: 24, Plumstead Road, London, SE18 7BZ Classification: Washing Machines - Servicing & Repairs **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A14SW (SE)	269	-	543989 178902
56	**Contemporary Trade Directory Entries** Name: Heaney Meat Ltd Location: 14, Parry Place, London, SE18 6AN Classification: Meat - Wholesale **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A13SE (SE)	252	-	543934 178846
56	**Contemporary Trade Directory Entries** Name: Heaney Meat Ltd Location: 14, Parry Place, London, SE18 6AN Classification: Meat - Wholesale **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A13SE (SE)	252	-	543934 178846
56	**Contemporary Trade Directory Entries** Name: B & J Services Location: 15, Parry Place, London, SE18 6AN Classification: Washing Machines - Servicing & Repairs **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A13SE (SE)	289	-	543968 178830

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
57	**Contemporary Trade Directory Entries** Name: Worldwide Link Uk Location: 1-3, Love Lane, London, SE18 6QT Classification: Freight Forwarders **Status: Active** Positional Accuracy: Automatically positioned to the address	A8NW (S)	264	-	543607 178779
57	**Contemporary Trade Directory Entries** Name: Worldwide Link Ltd Location: 1-3, Love Lane, London, SE18 6QT Classification: Airfreight Services **Status: Active** Positional Accuracy: Automatically positioned to the address	A8NW (S)	264	-	543607 178779
58	**Contemporary Trade Directory Entries** Name: Cheri'S Beauty Salon Location: 131, Woolwich High Street, London, SE18 6DS Classification: Electrolysis **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A12NE (W)	272	-	543258 179182
59	**Contemporary Trade Directory Entries** Name: Cleaners Woolwich Location: 18-36, Wellington Street, London, SE18 6PF Classification: Cleaning Services - Domestic **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A13SW (S)	273	-	543530 178812
59	**Contemporary Trade Directory Entries** Name: Cleaners Woolwich Location: 18-36, Wellington Street, London, SE18 6PF Classification: Cleaning Services - Domestic **Status: Active** Positional Accuracy: Automatically positioned to the address	A13SW (S)	273	-	543530 178812
59	**Contemporary Trade Directory Entries** Name: 786 Services Ltd Location: Suite 115p Block, 18-36 Wellington Street, London, SE18 6PF Classification: Commercial Cleaning Services **Status: Active** Positional Accuracy: Manually positioned within the geographical locality	A13SW (S)	273	-	543530 178812
59	**Contemporary Trade Directory Entries** Name: Smart Chemical Co Ltd The Location: Woolwich Campus, Wellington Street, London, SE18 6PF Classification: Chemicals - Distributors & Wholesalers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A13SW (S)	273	-	543530 178812
60	**Contemporary Trade Directory Entries** Name: A I S Services Ltd Location: 160-162, Powis Street, London, SE18 6NL Classification: Commercial Cleaning Services **Status: Inactive** Positional Accuracy: Manually positioned to the address or location	A12SE (W)	277	-	543264 179122
60	**Contemporary Trade Directory Entries** Name: Ais Facilities Cleaning Service Ltd Location: 162 Powis St, London, SE18 6NL Classification: Commercial Cleaning Services **Status: Inactive** Positional Accuracy: Manually positioned to the address or location	A12SE (W)	280	-	543262 179117
61	**Contemporary Trade Directory Entries** Name: Woolwich Express Location: 59, Woolwich New Road, London, SE18 6ED Classification: Dry Cleaners **Status: Active** Positional Accuracy: Automatically positioned to the address	A8NE (S)	288	-	543657 178736
61	**Contemporary Trade Directory Entries** Name: Cleaning Services Woolwich Location: 65, Woolwich New Road, London, SE18 6ED Classification: Cleaning Services - Domestic **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A8NE (S)	301	-	543646 178727
62	**Contemporary Trade Directory Entries** Name: Vivid Perception Location: Island Business Centre 18-36, Wellington Street, London, SE18 6PF Classification: Freight Forwarders **Status: Inactive** Positional Accuracy: Manually positioned to the address or location	A13SW (S)	293	-	543517 178796

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
62	**Contemporary Trade Directory Entries** Name: Castlewoods Location: 5-6, Love Lane, London, SE18 6QT Classification: Garage Services **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A8NW (S)	314	-	543545 178755
63	**Contemporary Trade Directory Entries** Name: Cleaners Polthorne Estate Location: 26, London, SE18 7HR Classification: Cleaning Services - Domestic **Status: Inactive** Positional Accuracy: Manually positioned within the geographical locality	A14SW (SE)	325	-	544041 178882
64	**Contemporary Trade Directory Entries** Name: Pison-Business Solutions Ltd Location: 20-22, Wilmount Street, London, SE18 6EN Classification: Commercial Cleaning Services **Status: Active** Positional Accuracy: Automatically positioned to the address	A8NE (S)	326	-	543717 178686
64	**Contemporary Trade Directory Entries** Name: Femsilva Ltd Location: 20-22, Wilmount Street, London, SE18 6EN Classification: Cleaning Services - Domestic **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A8NE (S)	326	-	543717 178686
65	**Contemporary Trade Directory Entries** Name: Citipost Ltd Location: 16, Gunnery Terrace, Cornwallis Road, London, SE18 6SW Classification: Distribution Services **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A14SW (E)	340	-	544083 178988
66	**Contemporary Trade Directory Entries** Name: F P Mailing (Premier) Ltd Location: 9-11 Gunnery Ter,Cornwallis Rd, London, SE18 6SW Classification: Mailing Machines & Equipment **Status: Inactive** Positional Accuracy: Manually positioned to the address or location	A14SW (E)	348	-	544086 179068
66	**Contemporary Trade Directory Entries** Name: Upscalecleaners Location: 9-11, Gunnery Terrace, Cornwallis Road, London, SE18 6SW Classification: Cleaning Services - Domestic **Status: Active** Positional Accuracy: Automatically positioned to the address	A14SW (E)	349	-	544087 179069
66	**Contemporary Trade Directory Entries** Name: Upscalecleaners Location: 9-11, Gunnery Terrace, Cornwallis Road, London, SE18 6SW Classification: Cleaning Services - Domestic **Status: Active** Positional Accuracy: Automatically positioned to the address	A14SW (E)	349	-	544087 179069
67	**Contemporary Trade Directory Entries** Name: Ask Mobile Accessories Location: 89, Woolwich New Road, London, SE18 6ED Classification: Mobile Phone Accessories and Car Kits **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A8NW (S)	356	-	543621 178677
67	**Contemporary Trade Directory Entries** Name: T & T Dry Cleaners Location: 9, Anglesea Road, London, SE18 6EG Classification: Dry Cleaners **Status: Active** Positional Accuracy: Automatically positioned to the address	A8NE (S)	364	-	543646 178661
67	**Contemporary Trade Directory Entries** Name: Big M Motor Spares Ltd Location: 93-95, Woolwich New Road, London, SE18 6EF Classification: Garage Services **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A8NW (S)	390	-	543610 178644
68	**Contemporary Trade Directory Entries** Name: Hop Stuff Location: 7, Gunnery Terrace, Cornwallis Road, London, SE18 6SW Classification: Brewers **Status: Active** Positional Accuracy: Automatically positioned to the address	A14SW (E)	362	-	544100 179066

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
68	**Contemporary Trade Directory Entries** Name: Scorpion Press Location: 7, Gunnery Terrace, London, SE18 6SW Classification: Printers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A14SW (E)	362	-	544100 179066
68	**Contemporary Trade Directory Entries** Name: Scorpion Press Ltd Location: 7, Gunnery Terrace, Cornwallis Road, London, SE18 6SW Classification: Printers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A14SW (E)	362	-	544100 179066
68	**Contemporary Trade Directory Entries** Name: Scrap Yard In London Htt Location: 12-14 Gunnery Terrace, London, se18 6sw Classification: Car Breakers & Dismantlers **Status: Active** Positional Accuracy: Manually positioned within the geographical locality	A14SW (E)	371	-	544110 179064
68	**Contemporary Trade Directory Entries** Name: Carlow Precast Location: Gunner House Gunnery Terrace, Cornwallis Road, London, SE18 6SW Classification: Concrete Products **Status: Active** Positional Accuracy: Manually positioned within the geographical locality	A14SW (E)	371	-	544110 179064
68	**Contemporary Trade Directory Entries** Name: Citipost (Europe) Ltd Location: Gunnery Ter,Cornwallis Rd, London, SE18 6SW Classification: Distribution Services **Status: Inactive** Positional Accuracy: Manually positioned within the geographical locality	A14SW (E)	382	-	544124 179031
68	**Contemporary Trade Directory Entries** Name: Carlow Precasts Location: 1, Gunnery Terrace, Cornwallis Road, London, SE18 6SW Classification: Concrete Products **Status: Active** Positional Accuracy: Automatically positioned to the address	A14SW (E)	400	-	544141 179052
68	**Contemporary Trade Directory Entries** Name: City Central Cleaning & Support Services Location: 1, Gunnery Terrace, Cornwallis Road, London, SE18 6SW Classification: Commercial Cleaning Services **Status: Active** Positional Accuracy: Automatically positioned to the address	A14SW (E)	400	-	544141 179052
68	**Contemporary Trade Directory Entries** Name: Phildon Footwear Location: 2, Gunnery Terrace, Cornwallis Road, London, SE18 6SW Classification: Footwear Manufacturers & Wholesale **Status: Active** Positional Accuracy: Automatically positioned to the address	A14SW (E)	409	-	544147 179070
69	**Contemporary Trade Directory Entries** Name: Plaistow Broadway Petrol Fitting Station Ltd Location: 37, Market Street, London, SE18 6QR Classification: Petrol Filling Stations **Status: Active** Positional Accuracy: Automatically positioned to the address	A13SW (SW)	375	-	543350 178844
70	**Contemporary Trade Directory Entries** Name: T F W Printers Ltd Location: Unit 28-29,The I O Centre,Armstrong Rd, London, SE18 6RS Classification: Printers **Status: Inactive** Positional Accuracy: Manually positioned within the geographical locality	A8NW (SW)	467	-	543423 178650
71	**Contemporary Trade Directory Entries** Name: Isis Office Ltd Location: Unit 39,The I O Centre,Armstrong Rd, London, SE18 6RS Classification: Printers **Status: Inactive** Positional Accuracy: Manually positioned within the geographical locality	A14SW (E)	471	-	544214 179029
72	**Contemporary Trade Directory Entries** Name: C D L Location: Unit 21-22, The I O Centre, Armstrong Road, London, SE18 6RS Classification: Freight Forwarders **Status: Active** Positional Accuracy: Automatically positioned to the address	A14SW (E)	474	-	544204 179123

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
72	**Contemporary Trade Directory Entries** Name: C D L London Ltd Location: Unit 22, The I O Centre, Armstrong Road, London, SE18 6RS Classification: Distribution Services **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A14SW (E)	474	-	544204 179123
73	**Contemporary Trade Directory Entries** Name: Blitz Sports Location: Unit 10,The I-O Centre,Duke Of Wellington Ave, Royal Arsenal, London, SE18 6SR Classification: Leisure & Sportswear Manufacturers & Wholesalers **Status: Inactive** Positional Accuracy: Manually positioned to the road within the address or location	A14SW (E)	482	-	544218 179094
73	**Contemporary Trade Directory Entries** Name: Briar Location: Duke of Wellington Av, London, SE18 6SS Classification: Mechanical Engineers **Status: Inactive** Positional Accuracy: Manually positioned to the road within the address or location	A14SW (E)	509	-	544246 179086
73	**Contemporary Trade Directory Entries** Name: F I T Shirts Location: Unit 20, The I O Centre, Armstrong Road, London, SE18 6RS Classification: T-Shirts **Status: Active** Positional Accuracy: Automatically positioned to the address	A14SW (E)	524	-	544258 179107
73	**Contemporary Trade Directory Entries** Name: Smiths Office Furniture Location: Armstrong Road, London, SE18 6RD Classification: Office Furniture & Equipment **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A14SW (E)	524	-	544258 179107
73	**Contemporary Trade Directory Entries** Name: T G Print & Design Location: Unit 20, The I O Centre, Armstrong Road, London, SE18 6RS Classification: Printers **Status: Active** Positional Accuracy: Automatically positioned to the address	A14SW (E)	524	-	544258 179107
74	**Contemporary Trade Directory Entries** Name: Dartex Office Furniture Location: Unit 23, The I O Centre, Armstrong Road, London, SE18 6RS Classification: Office Furniture & Equipment **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A14NW (E)	489	-	544200 179186
74	**Contemporary Trade Directory Entries** Name: Trident Printing Location: Unit 25, The I O Centre, Armstrong Road, London, SE18 6RS Classification: Printers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A14NW (E)	492	-	544192 179212
74	**Contemporary Trade Directory Entries** Name: Trident Printing Location: 24-26 Armstrong Road, London, SE18 6RS Classification: Printers **Status: Active** Positional Accuracy: Manually positioned to the address or location	A14NW (E)	499	-	544205 179200
75	**Contemporary Trade Directory Entries** Name: Unique Cleaning Services Location: Flat 78, Canada Court, 109, Brookhill Road, London, SE18 6BJ Classification: Carpet, Curtain & Upholstery Cleaners **Status: Active** Positional Accuracy: Automatically positioned to the address	A8NW (S)	501	-	543594 178533
76	**Contemporary Trade Directory Entries** Name: David Wealth Location: Flat 9, Abel House, Plumstead Road, London, SE18 7DD Classification: Cleaning Services - Domestic **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A14SW (E)	529	-	544262 178912

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
77	**Contemporary Trade Directory Entries** Name: K M Heating Location: 113, Burrage Road, London, SE18 7LN Classification: Boilers - Servicing, Replacements & Repairs **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A9NW (SE)	531	-	544082 178603
78	**Contemporary Trade Directory Entries** Name: Eque Distribution Ltd Location: Flat 603,Mizzen Mast House,Mast Quay, London, SE18 5NP Classification: Distribution Services **Status: Inactive** Positional Accuracy: Manually positioned to the address or location	A12NE (W)	554	-	542976 179254
79	**Contemporary Trade Directory Entries** Name: Ironing Service Location: St. Mary St, London, SE18 5AL Classification: Ironing & Home Laundry Services **Status: Inactive** Positional Accuracy: Manually positioned within the geographical locality	A12SE (W)	564	-	543017 178966
80	**Contemporary Trade Directory Entries** Name: Cityplus Servicesnlimited Location: Flat 14, Parker House, 120, Brookhill Road, London, SE18 6UU Classification: Commercial Cleaning Services **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A8SW (S)	581	-	543596 178449
81	**Contemporary Trade Directory Entries** Name: Absolute Hygiene Solutions Location: Unit 42, The I O Centre, Armstrong Road, London, SE18 6RS Classification: Hygiene & Cleansing Services **Status: Active** Positional Accuracy: Automatically positioned to the address	A14NE (E)	600	-	544319 179178
81	**Contemporary Trade Directory Entries** Name: Europa Goc Ltd Location: Unit 44 The I O Centre, Armstrong Road, London, SE18 6RS Classification: Printers **Status: Active** Positional Accuracy: Manually positioned to the address or location	A14NE (E)	626	-	544347 179174
81	**Contemporary Trade Directory Entries** Name: Gilmex International Ltd Location: Unit 40, The I O Centre, Armstrong Road, London, SE18 6RS Classification: Print Finishers **Status: Active** Positional Accuracy: Automatically positioned to the address	A14NE (E)	627	-	544343 179190
81	**Contemporary Trade Directory Entries** Name: Osgood Textiles Ltd Location: Unit 41,The I O Centre,Armstrong Rd, London, SE18 6RS Classification: Children & Babywear - Manufacturers & Wholesalers **Status: Active** Positional Accuracy: Manually positioned to the address or location	A14NE (E)	636	-	544354 179188
81	**Contemporary Trade Directory Entries** Name: Blinds Poles & Tracks Direct Location: Unit 45, The I O Centre, Armstrong Road, London, SE18 6RS Classification: Blinds, Awnings & Canopies **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A14NE (E)	646	-	544368 179177
81	**Contemporary Trade Directory Entries** Name: Cleaning Services Location: Pettacre Cl, London, SE28 0BX Classification: Cleaning Services - Domestic **Status: Inactive** Positional Accuracy: Manually positioned within the geographical locality	A14NE (E)	674	-	544396 179178
82	**Contemporary Trade Directory Entries** Name: Carter Allen Ltd Location: Unit 33, The I O Centre, Armstrong Road, London, SE18 6RS Classification: Office Equipment Manufacturers & Distributors **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A14NW (E)	618	-	544304 179271
83	**Contemporary Trade Directory Entries** Name: Hobbyshopuk Location: Unit 34, The I O Centre, Armstrong Road, London, SE18 6RS Classification: Electrical Goods Sales, Manufacturers & Wholesalers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A14NE (E)	630	-	544316 179274

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
83	**Contemporary Trade Directory Entries** Name: T G Print Location: Unit 36, The I O Centre, Armstrong Road, London, SE18 6RS Classification: Printers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A14NE (E)	654	-	544338 179281
83	**Contemporary Trade Directory Entries** Name: Flagship Print Location: Unit 36, The I O Centre, Armstrong Road, London, SE18 6RS Classification: Printers **Status: Active** Positional Accuracy: Automatically positioned to the address	A14NE (E)	654	-	544338 179281
83	**Contemporary Trade Directory Entries** Name: Delatim Location: Unit 38, The I O Centre, Armstrong Road, London, SE18 6RS Classification: Electrical Engineers **Status: Active** Positional Accuracy: Automatically positioned to the address	A14NE (E)	676	-	544360 179288
84	**Contemporary Trade Directory Entries** Name: A T A Cleaning Location: 12, Conduit Road, London, SE18 7AJ Classification: Cleaning Services - Domestic **Status: Active** Positional Accuracy: Automatically positioned to the address	A8SE (S)	632	-	543876 178393
85	**Contemporary Trade Directory Entries** Name: Allied Remedial Treatments Ltd Location: 4, Conduit Mews, London, SE18 7AP Classification: Damp & Dry Rot Control **Status: Active** Positional Accuracy: Automatically positioned to the address	A8SE (S)	636	-	543815 178380
86	**Contemporary Trade Directory Entries** Name: Bhl Leather Location: Unit 2,Gateway Business Centre,Tom Cribb Rd, London, SE28 0EZ Classification: Leather Garments & Products **Status: Inactive** Positional Accuracy: Manually positioned to the road within the address or location	A14SE (E)	670	-	544412 179050
87	**Contemporary Trade Directory Entries** Name: Eco Elite Location: Mulgrave Rd, London, SE18 5TY Classification: Energy Efficient Products and Services **Status: Active** Positional Accuracy: Manually positioned within the geographical locality	A7NE (SW)	709	-	542988 178743
88	**Contemporary Trade Directory Entries** Name: Us Ltd Location: 7 Pier Rd, London, E16 2JJ Classification: Catering Equipment **Status: Active** Positional Accuracy: Manually positioned to the address or location	A18NW (NW)	711	-	543309 179897
89	**Contemporary Trade Directory Entries** Name: Wicks Plastics Location: 5 Lowestoft Mews, London, E16 2ST Classification: Catering Equipment **Status: Inactive** Positional Accuracy: Manually positioned to the road within the address or location	A18NE (N)	714	-	543818 179920
90	**Contemporary Trade Directory Entries** Name: O A Electricals Location: 54, Brookhill Road, London, SE18 6TU Classification: Electrical Goods Sales, Manufacturers & Wholesalers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A8SE (S)	719	-	543637 178300
91	**Contemporary Trade Directory Entries** Name: W J King Garages Location: 40, Artillery Place, London, SE18 4AB Classification: Car Dealers **Status: Active** Positional Accuracy: Automatically positioned to the address	A7NE (SW)	741	-	543105 178570
92	**Contemporary Trade Directory Entries** Name: Fast Cleaners Location: 23, Sky Studios, 147, Albert Road, London, E16 2JN Classification: Commercial Cleaning Services **Status: Active** Positional Accuracy: Automatically positioned to the address	A17NE (NW)	742	-	543250 179906

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
92	**Contemporary Trade Directory Entries** Name: Fast Cleaners Ltd Location: 23, Sky Studios, 147, Albert Road, London, E16 2JN Classification: Carpet, Curtain & Upholstery Cleaners **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A17NE (NW)	744	-	543247 179907
92	**Contemporary Trade Directory Entries** Name: Uk Commercial Power Uk Ltd Location: 165 Albert Rd, London, E16 2JD Classification: Mechanical Engineers **Status: Inactive** Positional Accuracy: Manually positioned to the road within the address or location	A17NE (NW)	761	-	543236 179920
93	**Contemporary Trade Directory Entries** Name: Signature Industries Ltd Location: Tom Cribb Road, London, SE28 0BH Classification: Radio Communication Equipment **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A14SE (E)	756	-	544498 179021
93	**Contemporary Trade Directory Entries** Name: Signature Industries Ltd Location: Tom Cribb Road, London, SE28 0BH Classification: Radio Communication Equipment **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A14SE (E)	756	-	544498 179021
94	**Contemporary Trade Directory Entries** Name: Sure Communications Location: Custom House,Woolwich Manor Way, London, E16 2NJ Classification: Telecommunications Equipment & Systems **Status: Inactive** Positional Accuracy: Manually positioned to the road within the address or location	A18NE (N)	761	-	543703 179993
95	**Contemporary Trade Directory Entries** Name: Kimss Ltd Location: Swetenham Walk, London, SE18 7EZ Classification: Abrasive Products - Manufacturers & Distributors **Status: Active** Positional Accuracy: Manually positioned within the geographical locality	A9SW (SE)	764	-	544242 178433
96	**Contemporary Trade Directory Entries** Name: W Taylor & Sons Location: 76, Bloomfield Road, London, SE18 7JQ Classification: Scrap Metal Merchants **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A8SE (S)	774	-	543946 178264
96	**Contemporary Trade Directory Entries** Name: J C Garage Location: 75-77, Bloomfield Road, London, SE18 7JJ Classification: Garage Services **Status: Active** Positional Accuracy: Automatically positioned to the address	A8SE (S)	793	-	543918 178238
96	**Contemporary Trade Directory Entries** Name: Scarf Multi Skill Engineering Location: 22-23, Burrage Place, London, SE18 7BG Classification: Domestic Appliances - Servicing, Repairs & Parts **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A8SE (S)	806	-	543918 178224
97	**Contemporary Trade Directory Entries** Name: A Washing Machine Healer Location: 12, Storey Street, London, E16 2LT Classification: Domestic Appliances - Servicing, Repairs & Parts **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A18NW (N)	776	-	543390 179990
98	**Contemporary Trade Directory Entries** Name: Tills Location: 79, Sandy Hill Road, London, SE18 7BQ Classification: Garage Services **Status: Active** Positional Accuracy: Automatically positioned to the address	A8SE (S)	781	-	543778 178232
99	**Contemporary Trade Directory Entries** Name: Data Techniques Location: Unit 4, Gateway Business Centre, Tom Cribb Road, London, SE28 0EZ Classification: Fibre Optics **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A14SE (E)	795	-	544537 178978

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
100	**Contemporary Trade Directory Entries** Name: City Chairs Location: Flat 65, Claymill House, Raglan Road, London, SE18 7HX Classification: Office Furniture & Equipment **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A9SW (SE)	807	-	544197 178345
101	**Contemporary Trade Directory Entries** Name: Leonedahlia Cleaning Ltd Location: Flat 18, Sarah Turnbull House, 43, Brewhouse Road, London, SE18 5SH Classification: Commercial Cleaning Services **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A12SW (W)	811	-	542815 178818
102	**Contemporary Trade Directory Entries** Name: Trackwork Resources Ltd Location: Unit 9-11, Gateway Business Centre, Tom Cribb Road, London, SE28 0EZ Classification: Railways **Status: Active** Positional Accuracy: Automatically positioned to the address	A14SE (E)	819	-	544562 179029
103	**Contemporary Trade Directory Entries** Name: Super Bright Domestics Ltd Location: Flat 7, Plantagenet House, 1, Leda Road, London, SE18 5QR Classification: Cleaning Services - Domestic **Status: Active** Positional Accuracy: Automatically positioned to the address	A12NW (W)	820	-	542712 179128
104	**Contemporary Trade Directory Entries** Name: London'S Royal Docks Location: King George V Dock, Woolwich Manor Way, London, E16 2NJ Classification: Ports, Docks & Harbours **Status: Active** Positional Accuracy: Manually positioned within the geographical locality	A18NE (N)	820	-	543726 180049
105	**Contemporary Trade Directory Entries** Name: E 3 Taxis Location: 3d-3f, Unit, Standard Industrial Estate, Henley Road, London, E16 2ES Classification: Garage Services **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A17SW (NW)	830	-	542917 179773
105	**Contemporary Trade Directory Entries** Name: Ping Pong Location: Unit 3f, Standard Industrial Estate, Henley Road, LONDON, E16 2ES Classification: Food Products - Manufacturers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A17SW (NW)	830	-	542917 179773
106	**Contemporary Trade Directory Entries** Name: Burrage Autos Location: 37, Burrage Place, London, SE18 7BG Classification: Garage Services **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A9SW (S)	833	-	543999 178218
107	**Contemporary Trade Directory Entries** Name: The Retailers Market Ltd Location: 28, Pier Parade, London, E16 2LJ Classification: Electrical Goods Sales, Manufacturers & Wholesalers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A17NE (NW)	838	-	543267 180017
107	**Contemporary Trade Directory Entries** Name: 2 In 1 Dry Cleaners & Launderette Location: 6, Pier Parade, London, E16 2LJ Classification: Dry Cleaners **Status: Active** Positional Accuracy: Automatically positioned to the address	A17NE (NW)	858	-	543264 180037
108	**Contemporary Trade Directory Entries** Name: Cleaners North Woolwich Location: 16, Woodman Street, London, E16 2NF Classification: Cleaning Services - Domestic **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A18NW (N)	839	-	543591 180079
109	**Contemporary Trade Directory Entries** Name: Hercules Location: 13, Livesey Close, London, SE28 0GR Classification: Carpet, Curtain & Upholstery Cleaners **Status: Active** Positional Accuracy: Automatically positioned to the address	A19SE (NE)	859	-	544464 179492

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
110	**Contemporary Trade Directory Entries** Name: Henry & Henry Location: 95, Ann Street, London, SE18 7LS Classification: Builders' Merchants **Status: Active** Positional Accuracy: Automatically positioned to the address	A9NE (SE)	860	-	544529 178662
110	**Contemporary Trade Directory Entries** Name: The Lump Partnership Location: 79, Glyndon Road, LONDON, SE18 7PA Classification: Engineering Services **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A9NE (SE)	882	-	544538 178628
111	**Contemporary Trade Directory Entries** Name: Colton Commercials Location: 1j-1k, Unit, Standard Industrial Estate, Factory Road, London, E16 2EJ Classification: Commercial Vehicle Servicing, Repairs, Parts & Accessories **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A17NW (NW)	874	-	542935 179854
111	**Contemporary Trade Directory Entries** Name: Asiatic Location: Unit 1h, Standard Industrial Estate, Factory Road, London, E16 2EJ Classification: Frozen Food Processors & Distributors **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A17NW (NW)	880	-	542937 179864
111	**Contemporary Trade Directory Entries** Name: Metamorphis Car Care Ltd Location: Unit 1d, Standard Industrial Estate, Factory Road, London, E16 2EJ Classification: Garage Services **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A17NW (NW)	902	-	542945 179900
112	**Contemporary Trade Directory Entries** Name: 16o4 Location: 56, Hudson Place, London, SE18 7SL Classification: Clocks & Watches - Manufacturers & Wholesalers **Status: Active** Positional Accuracy: Automatically positioned to the address	A9SW (SE)	875	-	544273 178316
113	**Contemporary Trade Directory Entries** Name: O J'S Pallet Services Location: Unit 3g, Standard Industrial Estate, Henley Road, London, E16 2ES Classification: Pallets, Crates & Packing Cases **Status: Active** Positional Accuracy: Automatically positioned to the address	A17SW (NW)	904	-	542833 179789
113	**Contemporary Trade Directory Entries** Name: Marconi Marine Location: 5f-5k, Unit, Standard Industrial Estate, Henley Road, London, E16 2ES Classification: Electronic Engineers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A17NW (NW)	946	-	542791 179805
114	**Contemporary Trade Directory Entries** Name: Pest Pro Location: 34, Polthorne Grove, Polthorne Estate, London, SE18 7DU Classification: Pest & Vermin Control **Status: Active** Positional Accuracy: Automatically positioned to the address	A14SE (E)	911	-	544637 178838
115	**Contemporary Trade Directory Entries** Name: Bedrock Print Finishers Ltd Location: Unit 1n, Standard Industrial Estate, Factory Road, London, E16 2EJ Classification: Print Finishers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A17NW (NW)	926	-	542875 179868
115	**Contemporary Trade Directory Entries** Name: Bedrock Print Finishers Ltd Location: Unit 1N,Standard Ind Est,Factory Rd, London, E16 2EJ Classification: Print Finishers **Status: Inactive** Positional Accuracy: Manually positioned to the address or location	A17NW (NW)	927	-	542874 179868
115	**Contemporary Trade Directory Entries** Name: Online Lubricants Ltd Location: Unit 1S, Standard Industrial Estate, Factory Road, London, E16 2EJ Classification: Oil Companies **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A17NW (NW)	947	-	542883 179905

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
115	**Contemporary Trade Directory Entries** Name: Architech Engineering Location: Unit 1T,Standard Ind Est,Factory Rd, London, E16 2EJ Classification: Air Conditioning Equipment & Systems **Status: Inactive** Positional Accuracy: Manually positioned to the address or location	A17NW (NW)	953	-	542884 179914
116	**Contemporary Trade Directory Entries** Name: J S Transport Location: Factory Rd, London, E16 2EJ Classification: Road Haulage Services **Status: Inactive** Positional Accuracy: Manually positioned to the road within the address or location	A17NW (NW)	927	-	542949 179936
117	**Contemporary Trade Directory Entries** Name: Ybee Services Location: 68, Brookhill Close, LONDON, SE18 6UD Classification: Cleaning Services - Domestic **Status: Active** Positional Accuracy: Automatically positioned to the address	A8SW (S)	928	-	543489 178119
118	**Contemporary Trade Directory Entries** Name: Unit Dry Cleaners Location: 6, Frances Street, London, SE18 5EF Classification: Dry Cleaners **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A7NW (SW)	941	-	542873 178525
118	**Contemporary Trade Directory Entries** Name: Dots Soap Opera Location: 4, Frances Street, London, SE18 5EF Classification: Laundries & Launderettes **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A7NW (SW)	944	-	542877 178517
119	**Contemporary Trade Directory Entries** Name: Gmund Location: 56, Cumberland Court, Erebus Drive, London, SE28 0GE Classification: Paper & Pulp Mills **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A19SE (NE)	957	-	544491 179644
119	**Contemporary Trade Directory Entries** Name: Office Chair (Uk) Location: Sark Tower,Erebus Dr, London, SE28 0GG Classification: Office Furniture & Equipment **Status: Inactive** Positional Accuracy: Manually positioned to the road within the address or location	A19SE (NE)	961	-	544508 179624
120	**Contemporary Trade Directory Entries** Name: C R Cleaning Location: 101, Glyndon Road, London, SE18 7PA Classification: Cleaning Services - Domestic **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A9NE (SE)	958	-	544617 178619
121	**Contemporary Trade Directory Entries** Name: Permagard Location: 1u-1v, Unit, Standard Industrial Estate, Factory Road, London, E16 2EJ Classification: Commercial Vehicle & Car Cleaning Equipment & Supplies **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A17NW (NW)	958	-	542887 179923
122	**Contemporary Trade Directory Entries** Name: Thames Tyres Location: 3 Foreland St, London, SE18 7BY Classification: Tyre Dealers **Status: Inactive** Positional Accuracy: Manually positioned to the road within the address or location	A15SW (E)	977	-	544708 178861
122	**Contemporary Trade Directory Entries** Name: Bok Cop Location: Yard F, Foreland Street, London, SE18 7BY Classification: Tyre Dealers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A15SW (E)	990	-	544721 178854
123	**Contemporary Trade Directory Entries** Name: W Humphreys Transport (London) Ltd Location: Unit 7, Standard Industrial Estate, Factory Road, London, E16 2EJ Classification: Commercial Vehicle Bodybuilders & Repairers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A17NW (NW)	979	-	542826 179894

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
123	**Contemporary Trade Directory Entries** Name: W Humphreys Location: Unit 7, Standard Industrial Estate, Factory Road, London, E16 2EJ Classification: Road Haulage Services **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A17NW (NW)	979	-	542826 179894
123	**Contemporary Trade Directory Entries** Name: Energyst Cat Rental Power Location: Unit 7, Standard Industrial Estate, Factory Road, London, E16 2EJ Classification: Generators - Sales & Service **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A17NW (NW)	979	-	542826 179894
123	**Contemporary Trade Directory Entries** Name: S J Selfe & Sons Ltd Location: Unit 7, Standard Industrial Estate, Factory Road, London, E16 2EJ Classification: Road Haulage Services **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A17NW (NW)	979	-	542826 179894
123	**Contemporary Trade Directory Entries** Name: Halso Petroleum South Location: Unit 7, Standard Industrial Estate, Factory Road, London, E16 2EJ Classification: Fuel Dealers **Status: Inactive** Positional Accuracy: Manually positioned to the address or location	A17NW (NW)	979	-	542826 179894
124	**Contemporary Trade Directory Entries** Name: Cleaners Thamesmead West Location: 53, Whinchat Road, London, SE28 0EA Classification: Carpet, Curtain & Upholstery Cleaners **Status: Active** Positional Accuracy: Automatically positioned to the address	A15NW (E)	980	-	544682 179291
125	**Contemporary Trade Directory Entries** Name: Mary Maid Location: 42f, Walmer Terrace, London, SE18 7EB Classification: Cleaning Services - Domestic **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A10NW (E)	986	-	544693 178747
126	**Contemporary Trade Directory Entries** Name: Shining Homes Location: 11, St. Margarets Terrace, London, SE18 7RW Classification: Cleaning Services - Domestic **Status: Active** Positional Accuracy: Automatically positioned to the address	A9SW (SE)	992	-	544251 178159
127	**Contemporary Trade Directory Entries** Name: D J Building Supplies Location: 11, Brewery Road, London, SE18 7PS Classification: Builders' Merchants **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A9SE (SE)	993	-	544537 178415
128	**Contemporary Trade Directory Entries** Name: Abbey Autos Location: 1-2, Hillreach, London, SE18 4AJ Classification: Mot Testing Centres **Status: Active** Positional Accuracy: Automatically positioned to the address	A7NW (SW)	997	-	542815 178505
129	**Contemporary Trade Directory Entries** Name: Stagecoach Location: Plumstead Bus Garage, Pettman Crescent, London, SE28 0BJ Classification: Bus & Coach Operators & Stations **Status: Active** Positional Accuracy: Automatically positioned to the address	A15SW (E)	997	-	544739 178974
129	**Contemporary Trade Directory Entries** Name: Johnstones Leyland Decorating Centre Location: Plumstead Bus Garage, Pettman Crescent, London, SE28 0BJ Classification: Painting & Decorating Supplies **Status: Active** Positional Accuracy: Automatically positioned to the address	A15SW (E)	997	-	544739 178974

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
130	**Fuel Station Entries** Name: Shell Woolwich Location: 125-129 Woolwich High Street, Woolwich, LONDON, SE18 6DS Brand: Shell Premises Type: Not Applicable **Status: Obsolete** Positional Accuracy: Automatically positioned to the address	A12NE (W)	240	-	543291 179173
131	**Fuel Station Entries** Name: W J King Garages Woolwich Location: 40, Artillery Place, London, SE18 4AB Brand: Harvest Energy Premises Type: Petrol Station **Status: Open** Positional Accuracy: Manually positioned to the address or location	A7NE (SW)	725	-	543143 178554
132	**Fuel Station Entries** Name: Tills Garage Ltd Location: 79, Sandy Hill Road, London, SE18 7BQ Brand: UNBRANDED Premises Type: Petrol Station **Status: Open** Positional Accuracy: Automatically positioned to the address	A8SE (S)	781	-	543778 178231

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
133	**Marine Nature Reserves** Name: Thames Estuary Multiple Area: Y Area (m2): 10874320.9 Source: Natural England	A13NW (N)	109	7	543611 179352

Agency & Hydrological	Version	Update Cycle
Contaminated Land Register Entries and Notices		
London Borough of Greenwich - Environmental Health Department	April 2014	Annual Rolling Update
London Borough of Lewisham - Environmental Health Department	January 2013	Annual Rolling Update
London Borough of Bexley - Environmental Health Department	January 2015	Annual Rolling Update
London Borough of Barking And Dagenham - Health and Consumer Services	July 2014	Annual Rolling Update
London Borough of Newham - Environmental Health Department	March 2015	Annual Rolling Update
London Borough of Redbridge - Environmental Health Department	October 2014	Annual Rolling Update
London Borough of Tower Hamlets - Environmental Health Department	October 2014	Annual Rolling Update
London Borough of Bromley - Environmental Health Department	September 2014	Annual Rolling Update
Discharge Consents		
Environment Agency - Southern Region	January 2016	Quarterly
Environment Agency - Thames Region	January 2016	Quarterly
Enforcement and Prohibition Notices		
Environment Agency - Thames Region	March 2013	As notified
Integrated Pollution Controls		
Environment Agency - Thames Region	October 2008	Not Applicable
Integrated Pollution Prevention And Control		
Environment Agency - Thames Region	January 2016	Quarterly
Local Authority Integrated Pollution Prevention And Control		
London Borough of Barking And Dagenham - Environmental Health Department	April 2013	Annual Rolling Update
London Borough of Redbridge - Environmental Health Department	December 2014	Annual Rolling Update
London Borough of Bromley - Environmental Health Department	July 2015	Annual Rolling Update
London Borough of Greenwich - Environmental Health Department	June 2014	Annual Rolling Update
London Borough of Bexley - Environmental Health Department	March 2015	Annual Rolling Update
London Borough of Tower Hamlets - Environmental Health Department	October 2014	Annual Rolling Update
London Port Health Authority - Environmental Services	October 2014	Annual Rolling Update
London Borough of Newham - Environmental Health Department	September 2013	Annual Rolling Update
London Borough of Lewisham - Environmental Health Department	September 2014	Annual Rolling Update
Local Authority Pollution Prevention and Controls		
London Borough of Barking And Dagenham - Environmental Health Department	April 2013	Annual Rolling Update
London Borough of Redbridge - Environmental Health Department	December 2014	Annual Rolling Update
London Borough of Bromley - Environmental Health Department	July 2015	Annual Rolling Update
London Borough of Greenwich - Environmental Health Department	June 2014	Annual Rolling Update
London Borough of Bexley - Environmental Health Department	March 2015	Annual Rolling Update
London Borough of Newham - Environmental Health Department	March 2015	Annual Rolling Update
London Borough of Tower Hamlets - Environmental Health Department	October 2014	Annual Rolling Update
London Port Health Authority - Environmental Services	October 2014	Annual Rolling Update
London Borough of Lewisham - Environmental Health Department	September 2014	Annual Rolling Update
Local Authority Pollution Prevention and Control Enforcements		
London Borough of Barking And Dagenham - Environmental Health Department	April 2013	Annual Rolling Update
London Borough of Redbridge - Environmental Health Department	December 2014	Annual Rolling Update
London Borough of Bromley - Environmental Health Department	July 2015	Annual Rolling Update
London Borough of Greenwich - Environmental Health Department	June 2014	Annual Rolling Update
London Borough of Bexley - Environmental Health Department	March 2015	Annual Rolling Update
London Borough of Tower Hamlets - Environmental Health Department	October 2014	Annual Rolling Update
London Port Health Authority - Environmental Services	October 2014	Annual Rolling Update
London Borough of Newham - Environmental Health Department	September 2013	Annual Rolling Update
London Borough of Lewisham - Environmental Health Department	September 2014	Annual Rolling Update
Nearest Surface Water Feature		
Ordnance Survey	July 2012	Quarterly
Pollution Incidents to Controlled Waters		
Environment Agency - Southern Region	December 1999	Not Applicable
Environment Agency - Thames Region	September 1999	Not Applicable

Agency & Hydrological	Version	Update Cycle
Prosecutions Relating to Authorised Processes		
Environment Agency - Thames Region	March 2013	As notified
Prosecutions Relating to Controlled Waters		
Environment Agency - Thames Region	March 2013	As notified
River Quality		
Environment Agency - Head Office	November 2001	Not Applicable
River Quality Biology Sampling Points		
Environment Agency - Head Office	July 2012	Annually
River Quality Chemistry Sampling Points		
Environment Agency - Head Office	July 2012	Annually
Substantiated Pollution Incident Register		
Environment Agency - Thames Region - North East Area	January 2016	Quarterly
Environment Agency - Thames Region - South East Area	January 2016	Quarterly
Water Abstractions		
Environment Agency - Southern Region	January 2016	Quarterly
Environment Agency - Thames Region	January 2016	Quarterly
Water Industry Act Referrals		
Environment Agency - Thames Region	January 2016	Quarterly
Groundwater Vulnerability		
Environment Agency - Head Office	April 2015	Not Applicable
Drift Deposits		
Environment Agency - Head Office	January 1999	Not Applicable
Bedrock Aquifer Designations		
British Geological Survey - National Geoscience Information Service	August 2015	As notified
Superficial Aquifer Designations		
British Geological Survey - National Geoscience Information Service	August 2015	As notified
Source Protection Zones		
Environment Agency - Head Office	January 2016	Quarterly
Extreme Flooding from Rivers or Sea without Defences		
Environment Agency - Head Office	February 2016	Quarterly
Flooding from Rivers or Sea without Defences		
Environment Agency - Head Office	February 2016	Quarterly
Areas Benefiting from Flood Defences		
Environment Agency - Head Office	February 2016	Quarterly
Flood Water Storage Areas		
Environment Agency - Head Office	February 2016	Quarterly
Flood Defences		
Environment Agency - Head Office	February 2016	Quarterly
Detailed River Network Lines		
Environment Agency - Head Office	March 2012	Annually
Detailed River Network Offline Drainage		
Environment Agency - Head Office	March 2012	Annually
BGS Groundwater Flooding Susceptibility		
British Geological Survey - National Geoscience Information Service	May 2013	Annually

Waste	Version	Update Cycle
BGS Recorded Landfill Sites		
British Geological Survey - National Geoscience Information Service	June 1996	Not Applicable
Integrated Pollution Control Registered Waste Sites		
Environment Agency - Thames Region	October 2008	Not Applicable
Licensed Waste Management Facilities (Landfill Boundaries)		
Environment Agency - Thames Region - North East Area	February 2016	Quarterly
Environment Agency - Thames Region - South East Area	February 2016	Quarterly
Licensed Waste Management Facilities (Locations)		
Environment Agency - South East Region - Kent & South London Area	January 2016	Quarterly
Environment Agency - Thames Region - North East Area	January 2016	Quarterly
Environment Agency - Thames Region - South East Area	January 2016	Quarterly
Local Authority Landfill Coverage		
London Borough of Barking And Dagenham - Environmental Health Department	May 2000	Not Applicable
London Borough of Bexley - Environmental Health Department	May 2000	Not Applicable
London Borough of Bromley - Environmental Health Department	May 2000	Not Applicable
London Borough of Greenwich - Environmental Health Department	May 2000	Not Applicable
London Borough of Lewisham - Environmental Health Department	May 2000	Not Applicable
London Borough of Newham	May 2000	Not Applicable
London Borough of Redbridge - Environmental Health Department	May 2000	Not Applicable
London Borough of Tower Hamlets - Environmental Health Department	May 2000	Not Applicable
Local Authority Recorded Landfill Sites		
London Borough of Tower Hamlets - Environmental Health Department	April 2003	Not Applicable
London Borough of Bromley - Environmental Health Department	June 2003	Not Applicable
London Borough of Barking And Dagenham - Environmental Health Department	May 2000	Not Applicable
London Borough of Bexley - Environmental Health Department	May 2000	Not Applicable
London Borough of Greenwich - Environmental Health Department	May 2000	Not Applicable
London Borough of Lewisham - Environmental Health Department	May 2000	Not Applicable
London Borough of Newham	May 2000	Not Applicable
London Borough of Redbridge - Environmental Health Department	May 2000	Not Applicable
Registered Landfill Sites		
Environment Agency - Thames Region - North East Area	March 2003	Not Applicable
Environment Agency - Thames Region - South East Area	March 2003	Not Applicable
Registered Waste Transfer Sites		
Environment Agency - Thames Region - North East Area	March 2003	Not Applicable
Environment Agency - Thames Region - South East Area	March 2003	Not Applicable
Registered Waste Treatment or Disposal Sites		
Environment Agency - Thames Region - North East Area	June 2015	Not Applicable
Environment Agency - Thames Region - South East Area	March 2003	Not Applicable

Hazardous Substances	Version	Update Cycle
Control of Major Accident Hazards Sites (COMAH)		
Health and Safety Executive	February 2016	Bi-Annually
Explosive Sites		
Health and Safety Executive	February 2016	Bi-Annually
Notification of Installations Handling Hazardous Substances (NIHHS)		
Health and Safety Executive	November 2000	Not Applicable
Planning Hazardous Substance Enforcements		
London Borough of Lewisham - Planning Services	April 2015	Annual Rolling Update
London Borough of Barking And Dagenham	February 2016	Annual Rolling Update
London Borough of Bromley	February 2016	Annual Rolling Update
London Borough of Greenwich - Planning Department	February 2016	Annual Rolling Update
London Borough of Newham	February 2016	Annual Rolling Update
London Borough of Redbridge	February 2016	Annual Rolling Update
London Borough of Tower Hamlets	February 2016	Annual Rolling Update
London Port Health Authority - Environmental Services	January 2008	Annual Rolling Update
London Borough of Bexley - Development Control	January 2016	Annual Rolling Update
Planning Hazardous Substance Consents		
London Borough of Lewisham - Planning Services	April 2015	Annual Rolling Update
London Borough of Barking And Dagenham	February 2016	Annual Rolling Update
London Borough of Bromley	February 2016	Annual Rolling Update
London Borough of Greenwich - Planning Department	February 2016	Annual Rolling Update
London Borough of Newham	February 2016	Annual Rolling Update
London Borough of Redbridge	February 2016	Annual Rolling Update
London Borough of Tower Hamlets	February 2016	Annual Rolling Update
London Port Health Authority - Environmental Services	January 2008	Annual Rolling Update
London Borough of Bexley - Development Control	January 2016	Annual Rolling Update

Geological	Version	Update Cycle
BGS 1:625,000 Solid Geology British Geological Survey - National Geoscience Information Service	January 2009	Not Applicable
BGS Recorded Mineral Sites British Geological Survey - National Geoscience Information Service	November 2015	Bi-Annually
Brine Compensation Area Cheshire Brine Subsidence Compensation Board	August 2011	Not Applicable
Coal Mining Affected Areas The Coal Authority - Property Searches	March 2014	As notified
Mining Instability Ove Arup & Partners	October 2000	Not Applicable
Non Coal Mining Areas of Great Britain British Geological Survey - National Geoscience Information Service	May 2015	Not Applicable
Potential for Collapsible Ground Stability Hazards British Geological Survey - National Geoscience Information Service	June 2015	Annually
Potential for Compressible Ground Stability Hazards British Geological Survey - National Geoscience Information Service	June 2015	Annually
Potential for Ground Dissolution Stability Hazards British Geological Survey - National Geoscience Information Service	June 2015	Annually
Potential for Landslide Ground Stability Hazards British Geological Survey - National Geoscience Information Service	June 2015	Annually
Potential for Running Sand Ground Stability Hazards British Geological Survey - National Geoscience Information Service	June 2015	Annually
Potential for Shrinking or Swelling Clay Ground Stability Hazards British Geological Survey - National Geoscience Information Service	June 2015	Annually
Radon Potential - Radon Affected Areas British Geological Survey - National Geoscience Information Service	July 2011	As notified
Radon Potential - Radon Protection Measures British Geological Survey - National Geoscience Information Service	July 2011	As notified
Industrial Land Use	**Version**	**Update Cycle**
Contemporary Trade Directory Entries Thomson Directories	November 2015	Quarterly
Fuel Station Entries Catalist Ltd - Experian	November 2015	Quarterly
Gas Pipelines National Grid	July 2014	Quarterly
Underground Electrical Cables National Grid	January 2016	Bi-Annually

Sensitive Land Use	Version	Update Cycle
Ancient Woodland		
Natural England	June 2015	Bi-Annually
Areas of Adopted Green Belt		
London Borough of Barking And Dagenham	January 2016	As notified
London Borough of Bexley - Development Control	January 2016	As notified
London Borough of Bromley	January 2016	As notified
London Borough of Greenwich	January 2016	As notified
London Borough of Newham	January 2016	As notified
London Borough of Redbridge	January 2016	As notified
Areas of Unadopted Green Belt		
London Borough of Barking And Dagenham	November 201	As notified
London Borough of Bexley - Development Control	November 201	As notified
London Borough of Bromley	November 201	As notified
London Borough of Greenwich	November 201	As notified
London Borough of Newham	November 201	As notified
London Borough of Redbridge	November 201	As notified
Areas of Outstanding Natural Beauty		
Natural England	October 2015	Bi-Annually
Environmentally Sensitive Areas		
Natural England	October 2015	Annually
Forest Parks		
Forestry Commission	April 1997	Not Applicable
Local Nature Reserves		
Natural England	October 2015	Bi-Annually
Marine Nature Reserves		
Natural England	October 2015	Bi-Annually
National Nature Reserves		
Natural England	October 2015	Bi-Annually
National Parks		
Natural England	March 2016	Bi-Annually
Nitrate Sensitive Areas		
Department for Environment, Food and Rural Affairs (DEFRA - formerly FRCA)	October 2015	Not Applicable
Nitrate Vulnerable Zones		
Department for Environment, Food and Rural Affairs (DEFRA - formerly FRCA)	October 2015	Annually
Ramsar Sites		
Natural England	October 2015	Bi-Annually
Sites of Special Scientific Interest		
Natural England	October 2015	Bi-Annually
Special Areas of Conservation		
Natural England	October 2015	Bi-Annually
Special Protection Areas		
Natural England	October 2015	Bi-Annually
World Heritage Sites		
English Heritage - National Monument Record Centre	September 2015	Bi-Annually

Data Suppliers

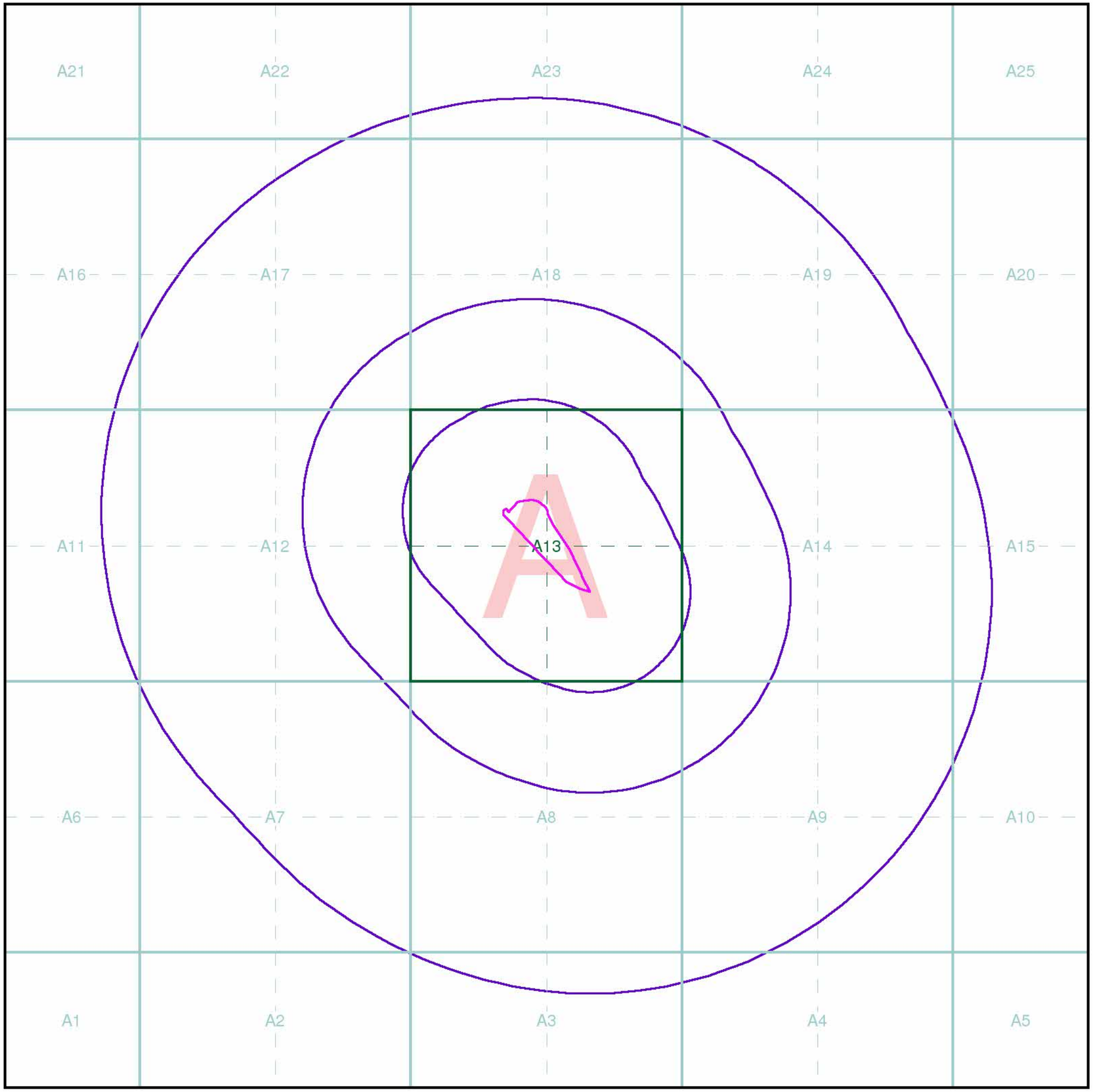
A selection of organisations who provide data within this report

Data Supplier	Data Supplier Logo
Ordnance Survey	
Environment Agency	
Scottish Environment Protection Agency	
The Coal Authority	
British Geological Survey	
Centre for Ecology and Hydrology	
Natural Resources Wales	
Scottish Natural Heritage	
Natural England	
Public Health England	
Ove Arup	
Peter Brett Associates	

Useful Contacts

Contact	Name and Address	Contact Details
1	**British Geological Survey - Enquiry Service** British Geological Survey, Kingsley Dunham Centre, Keyworth, Nottingham, Nottinghamshire, NG12 5GG	Telephone: 0115 936 3143 Fax: 0115 936 3276 Email: enquiries@bgs.ac.uk Website: www.bgs.ac.uk
2	**Environment Agency - National Customer Contact Centre (NCCC)** PO Box 544, Templeborough, Rotherham, S60 1BY	Telephone: 03708 506 506 Email: enquiries@environment-agency.gov.uk
3	**London Borough of Greenwich - Environmental Health Department** 12th Floor, Riverside House, Woolwich, London, SE18 6DN	Telephone: 020 8854 8888 Fax: 020 8921 8322 Website: www.greenwich.gov.uk
4	**London Borough of Newham - Environmental Health Department** Alice Billings House, 2-12 West Ham Lane, London, E15 4SF	Telephone: 020 8430 2000 Fax: 020 8557 8869 Website: www.newham.gov.uk
5	**London Borough of Newham** Town Hall Annexe, Barking Road, East Ham, London, E6 2RP	Telephone: 020 8430 2000 Fax: 020 8472 2284 Website: www.newham.gov.uk
6	**Peter Brett Associates** Caversham Bridge House, Waterman Place, Reading, Berkshire, RG1 8DN	Telephone: 0118 950 0761 Fax: 0118 959 7498 Email: reading@pba.co.uk Website: www.pba.co.uk
7	**Natural England** Suite D, Unex House, Bourges Boulevard, Peterborough, Cambridgeshire, PE1 1NG	Telephone: 0845 600 3078 Email: enquiries@naturalengland.org.uk Website: www.naturalengland.org.uk
-	**Public Health England - Radon Survey, Centre for Radiation, Chemical and Environmental Hazards** Chilton, Didcot, Oxfordshire, OX11 0RQ	Telephone: 01235 822622 Fax: 01235 833891 Email: radon@phe.gov.uk Website: www.ukradon.org
-	**Landmark Information Group Limited** Imperium, Imperial Way, Reading, Berkshire, RG2 0TD	Telephone: 0844 844 9952 Fax: 0844 844 9951 Email: customerservices@landmarkinfo.co.uk Website: www.landmarkinfo.co.uk

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



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Index Map

For ease of identification, your site and buffer have been split into Slices, Segments and Quadrants. These are illustrated on the Index Map opposite and explained further below.

Slice
Each slice represents a 1:10,000 plot area (2.7km x 2.7km) for your site and buffer. A large site and buffer may be made up of several slices (represented by a red outline), that are referenced by letters of the alphabet, starting from the bottom left corner of the slice "grid". This grid does not relate to National Grid lines but is designed to give best fit over the site and buffer.

Segment
A segment represents a 1:2,500 plot area. Segments that have plot files associated with them are shown in dark green, others in light blue. These are numbered from the bottom left hand corner within each slice.

Quadrant
A quadrant is a quarter of a segment. These are labelled as NW, NE, SW, SE and are referenced in the datasheet to allow features to be quickly located on plots. Therefore a feature that has a quadrant reference of A7NW will be in Slice A, Segment 7 and the NW Quadrant.

A selection of organisations who provide data within this report:

Map data

British Geological Survey
NATURAL ENVIRONMENT RESEARCH COUNCIL

Environment Agency

NATURAL ENGLAND

Envirocheck reports are compiled from 136 different sources of data.

Client Details

Mr E Tweedie, Tweedie Evans Consulting Ltd, The Old Chapel, 35a Southover, Wells, Somerset, BA5 1UH

Order Details

Order Number:	83661986_1_1
Customer Ref:	1508005.003
National Grid Reference:	543630, 179140
Site Area (Ha):	1.71
Search Buffer (m):	1000

Site Details

Phase 18-19, Warren Lane, LONDON

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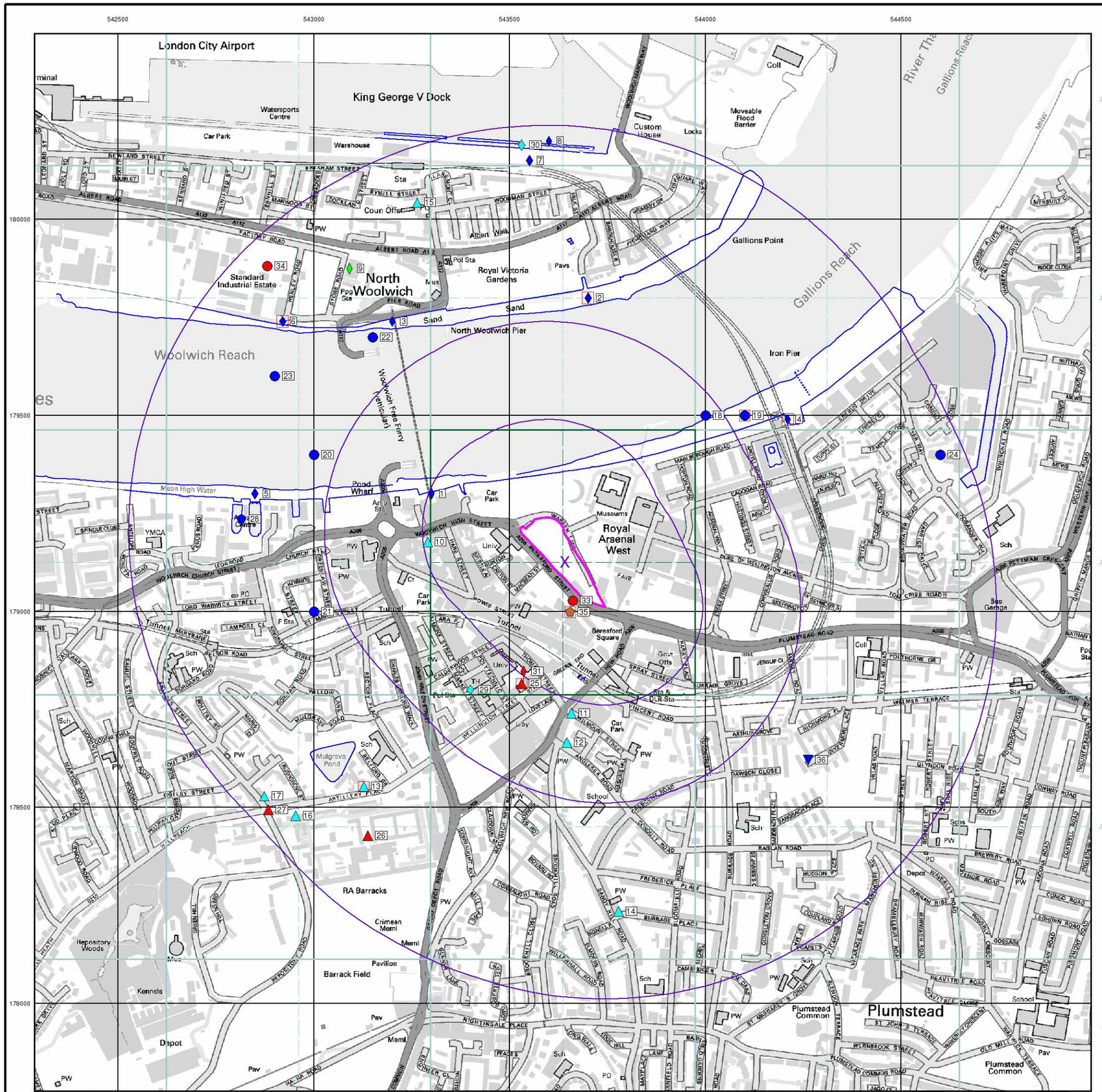

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General

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

Agency and Hydrological

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

Geological

- BGS Recorded Mineral Site

Industrial Land Use

- Contemporary Trade Directory Entry
- Fuel Station Entry

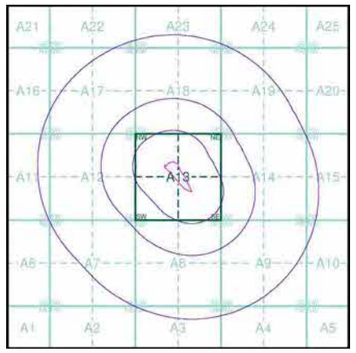
Waste

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

Hazardous Substances

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

Site Sensitivity Map - Slice A



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Slice:	A
Site Area (Ha):	1.71
Search Buffer (m):	1000

Site Details

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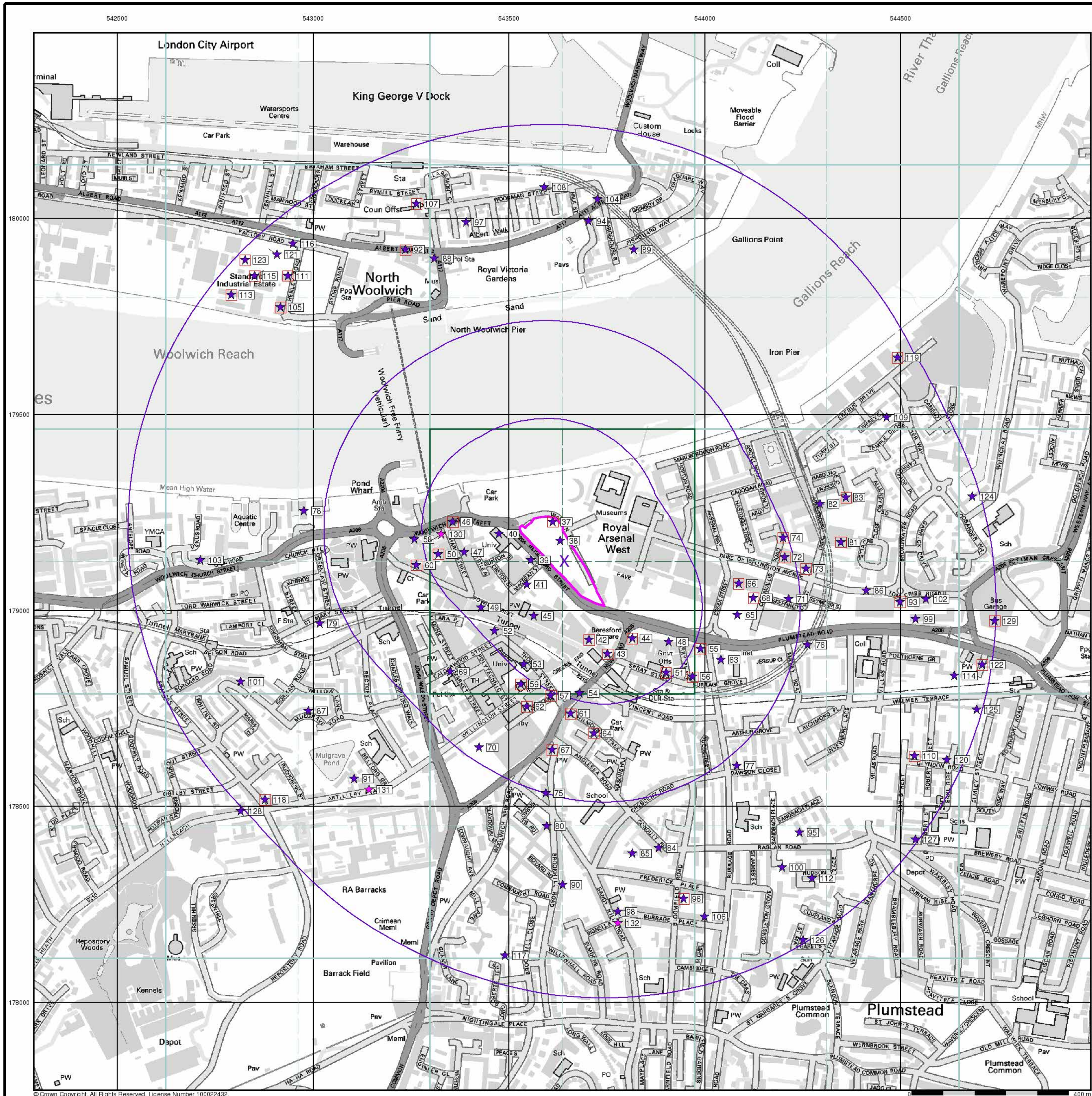
Industrial Land Use Map



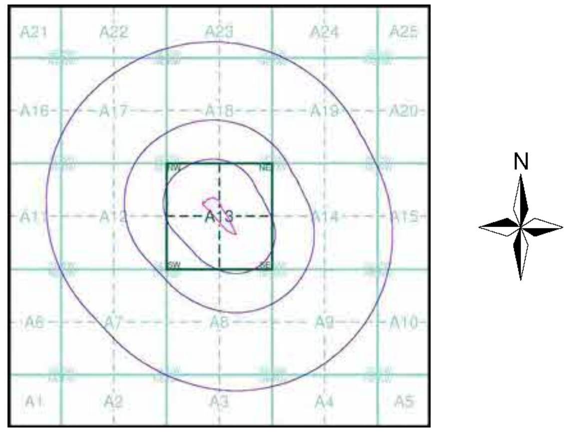
General

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

Industrial Land Use

Contemporary Trade Directory Entry
Fuel Station Entry
Gas Pipeline
Underground Electrical Cables

Industrial Land Use Map - Slice A



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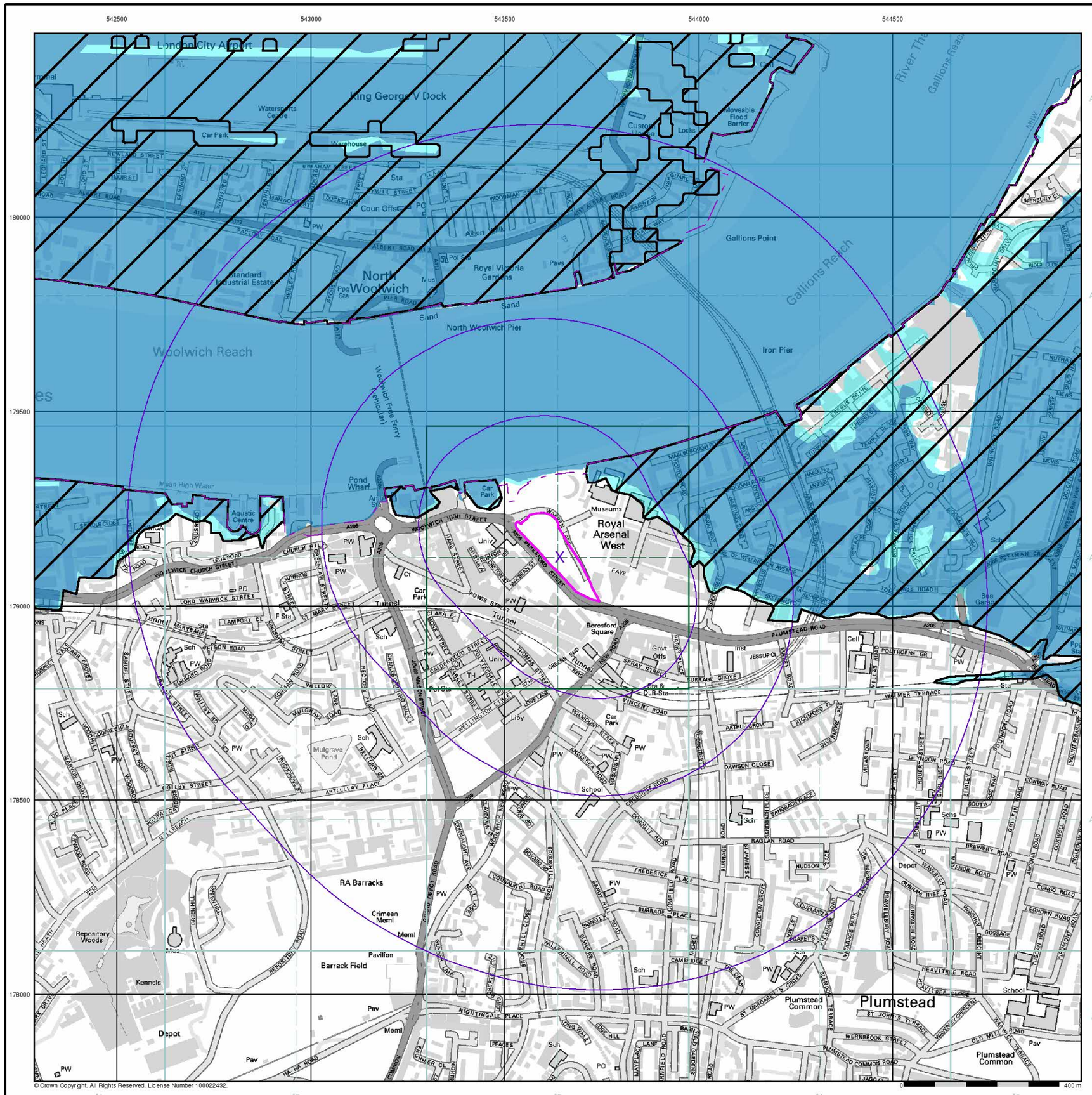

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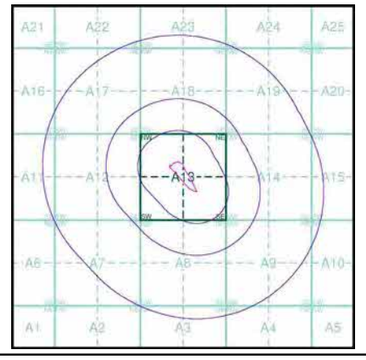
General

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

Agency and Hydrological (Flood)

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

Flood Map - Slice A



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Customer Ref:	1508005.003
National Grid Reference:	543640, 179130
Slice:	A
Site Area (Ha):	1.71
Search Buffer (m):	1000

Site Details

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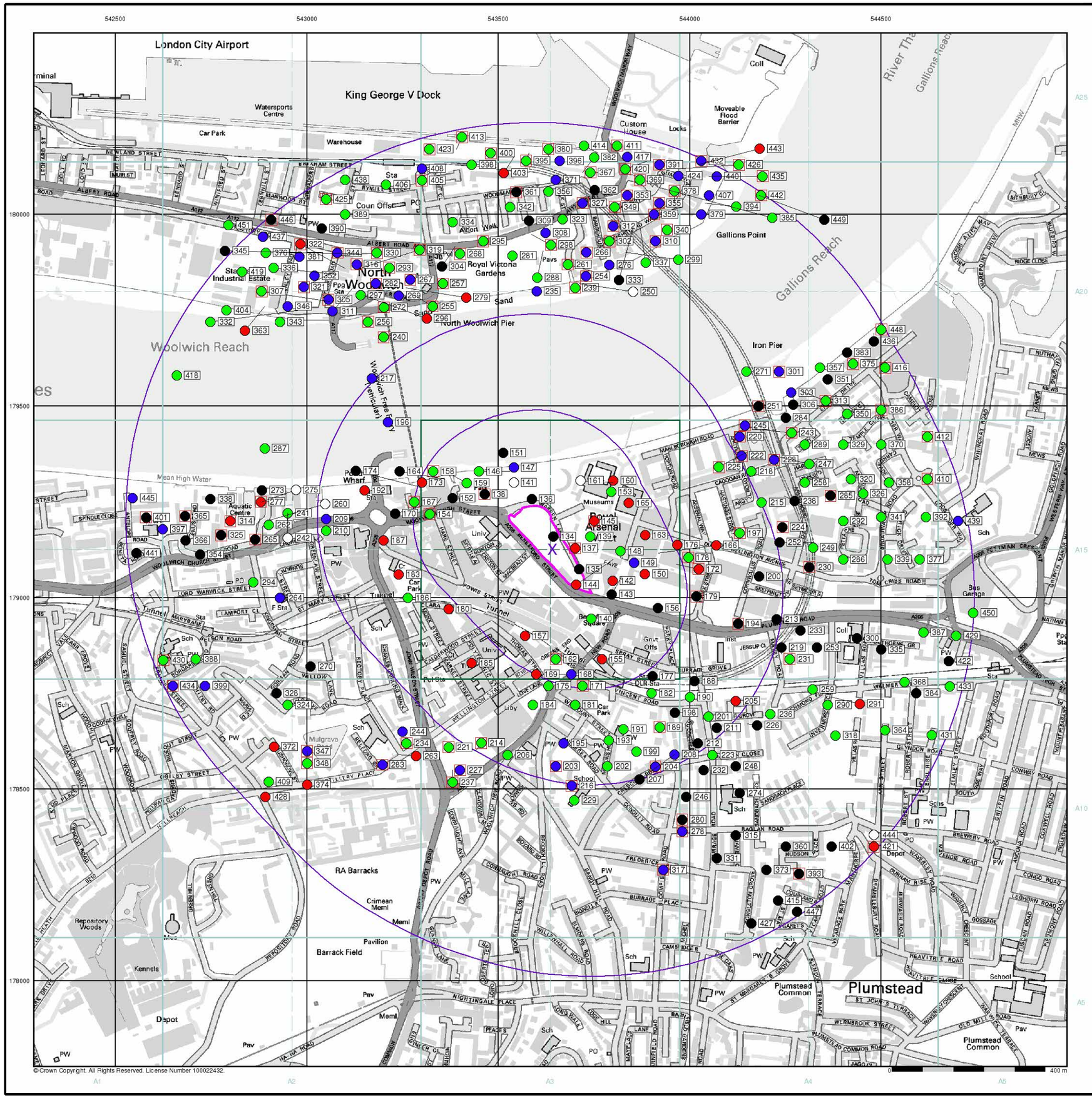

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General

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

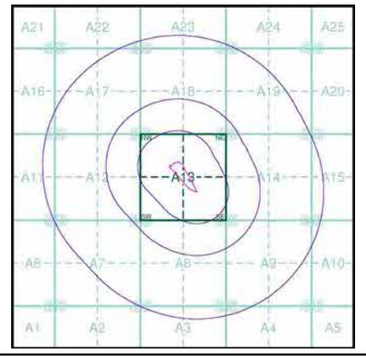
Agency and Hydrological (Boreholes)

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

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

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

Borehole Map - Slice A



Order Details

Order Number:	83661986_1_1
Customer Ref:	1508005.003
National Grid Reference:	543640, 179130
Slice:	A
Site Area (Ha):	1.71
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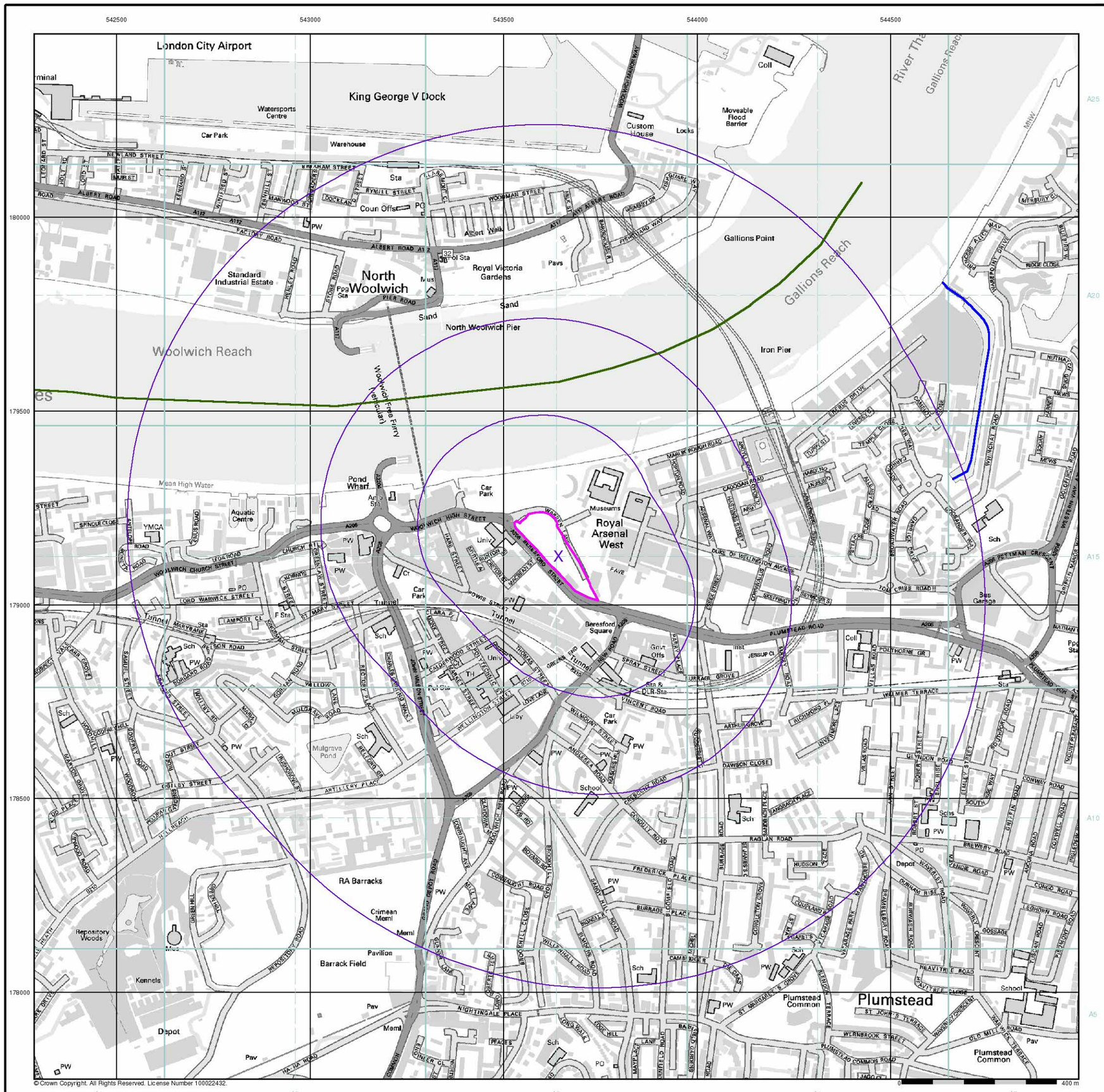

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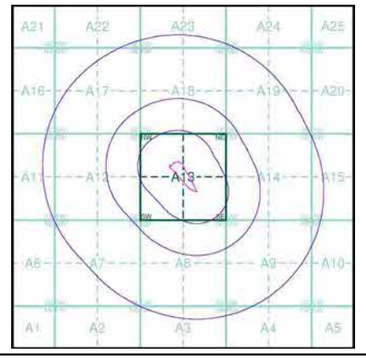
General

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

Detailed River Network Data

- Primary River
- Secondary River
- Tertiary River
- Canal
- Canal Tunnel
- Undefined River
- Lake/Reservoir
- Offline Drainage Feature
- Extended Culvert (greater than 50m)
- Underground River (inferred)
- Underground River (local knowledge)
- Downstream of High Water Mark
- Downstream of Seaward Extension
- Not assigned River feature

EA/NRW Detailed River Network Map - Slice A



Order Details

Order Number:	83661986_1_1
Customer Ref:	1508005.003
National Grid Reference:	543640, 179130
Slice:	A
Site Area (Ha):	1.71
Search Buffer (m):	1000

Site Details

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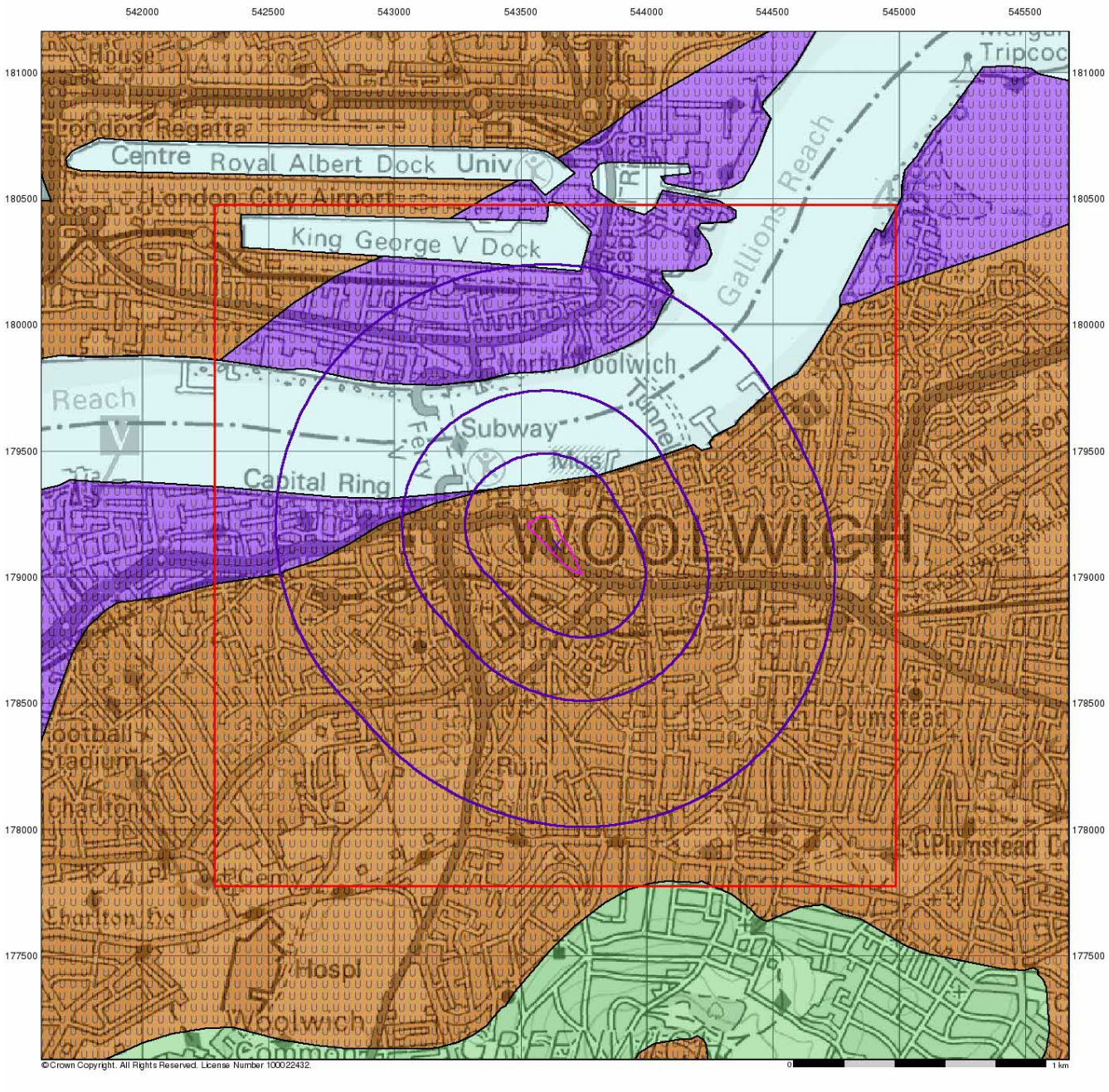

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Groundwater Vulnerability

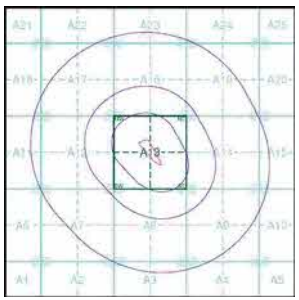
General

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

Agency and Hydrological

Geological Classes	Soil Classes
Major Aquifer (Highly Permeable)	High (H) 1, 2, 3, U
	Intermediate (I) 1, 2
	Low
Minor Aquifer (Variably Permeable)	High (H) 1, 2, 3, U
	Intermediate (I) 1, 2
	Low
Non Aquifer (Negligibly Permeable)	
Water or Sea	
Drift Deposit	

Site Sensitivity Context Map - Slice A



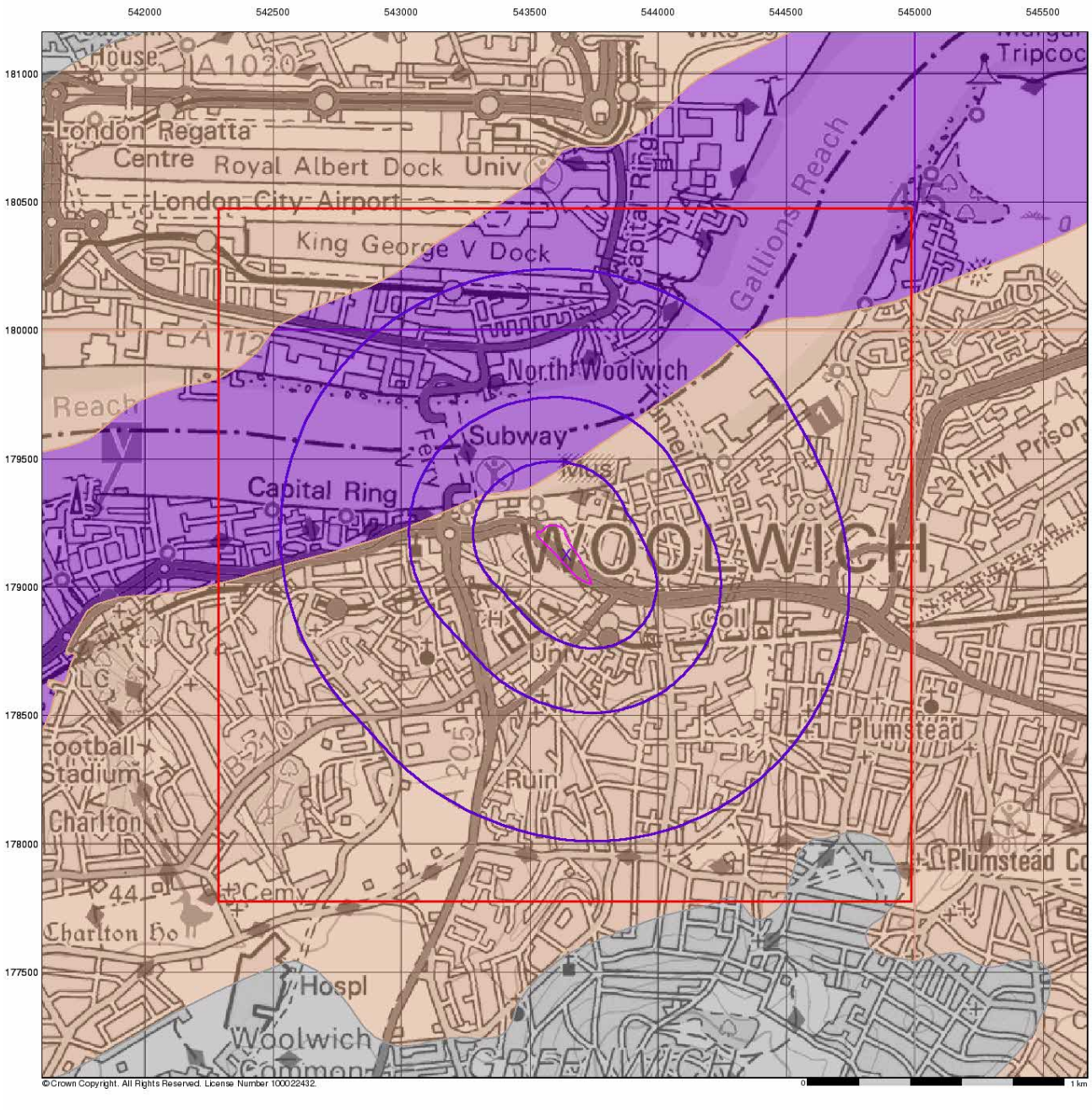
Order Details

Order Number:	83661986_1_1
Customer Ref:	1508005.003
National Grid Reference:	543640, 179130
Slice:	A
Site Area (Ha):	1.71
Search Buffer (m):	1000

Site Details

Phase 18-19, Warren Lane, LONDON

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



TWEEDIE EVANS CONSULTING

Bedrock Aquifer Designation

General

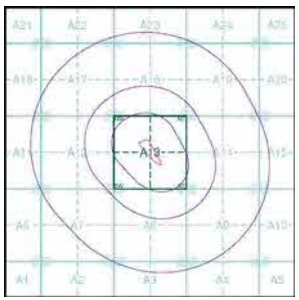
Specified Site | Specified Buffer(s) | Bearing Reference Point | Slice | Map ID

Agency and Hydrological

Geological Classes

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

Site Sensitivity Context Map - Slice A



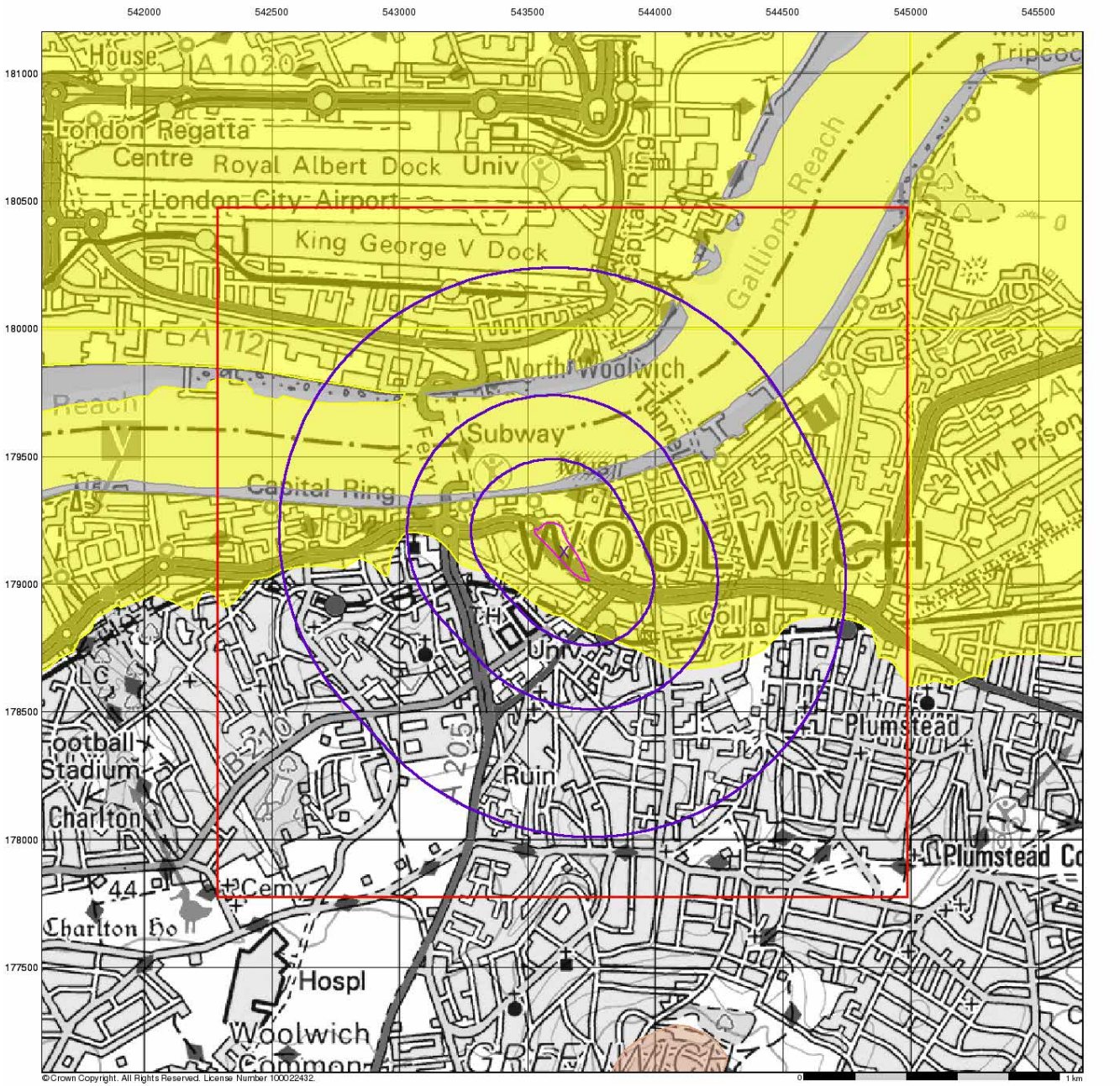
Order Details

Order Number:	83661986_1_1
Customer Ref:	1508005.003
National Grid Reference:	543640, 179130
Slice:	A
Site Area (Ha):	1.71
Search Buffer (m):	1000

Site Details

Phase 18-19, Warren Lane, LONDON

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



TWEEDIE EVANS CONSULTING

Superficial Aquifer Designation

General

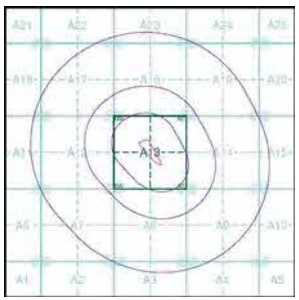
Specified Site | Specified Buffer(s) | Bearing Reference Point | Slice | Map ID

Agency and Hydrological

Geological Classes

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

Site Sensitivity Context Map - Slice A



N

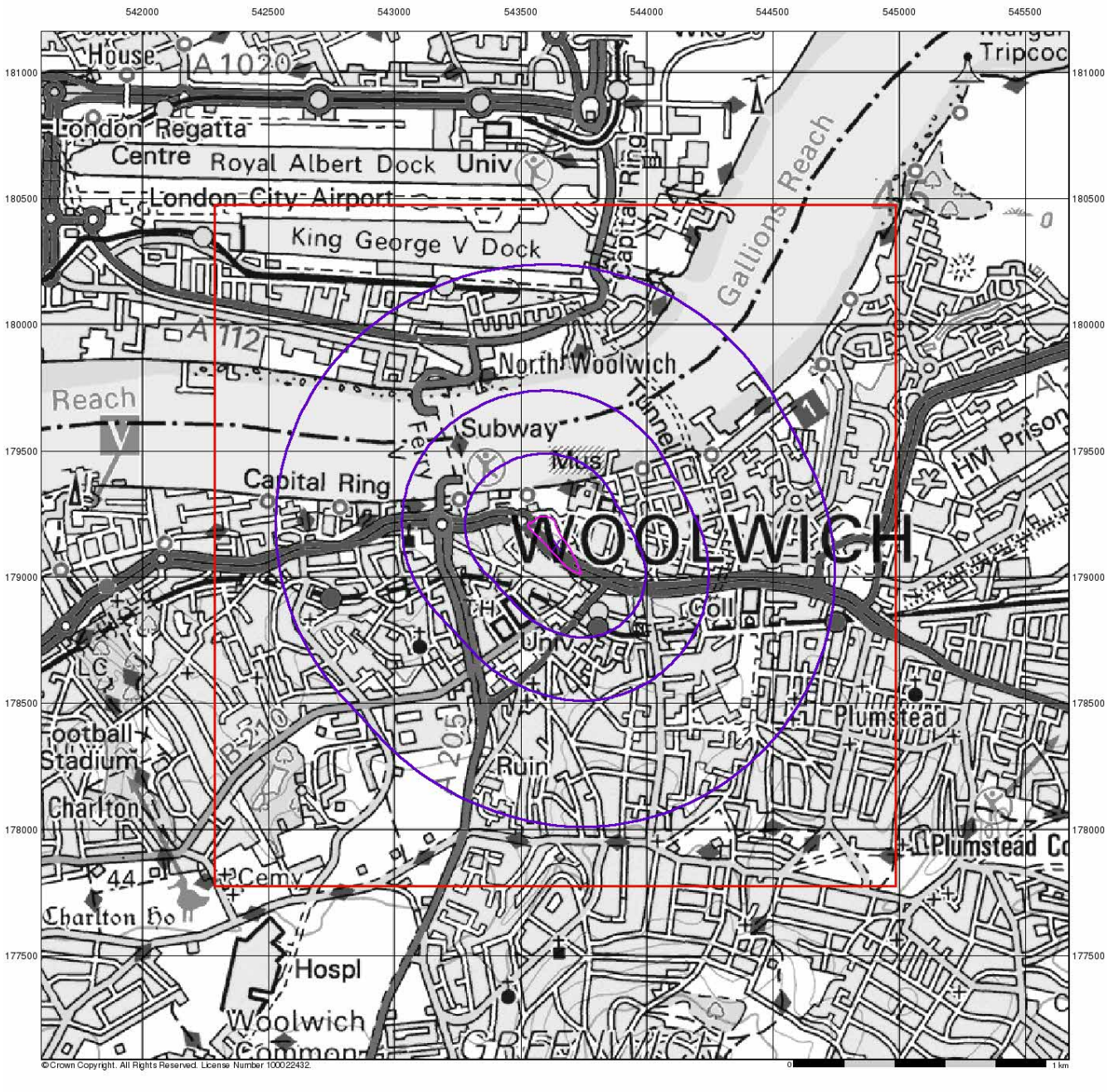
Order Details

Order Number:	83661986_1_1
Customer Ref:	1508005.003
National Grid Reference:	543640, 179130
Slice:	A
Site Area (Ha):	1.71
Search Buffer (m):	1000

Site Details

Phase 18-19, Warren Lane, LONDON

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



TWEEDIE EVANS CONSULTING

Source Protection Zones

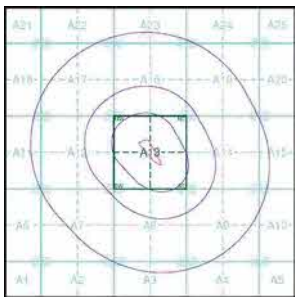
General

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

Agency and Hydrological

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

Site Sensitivity Context Map - Slice A



N

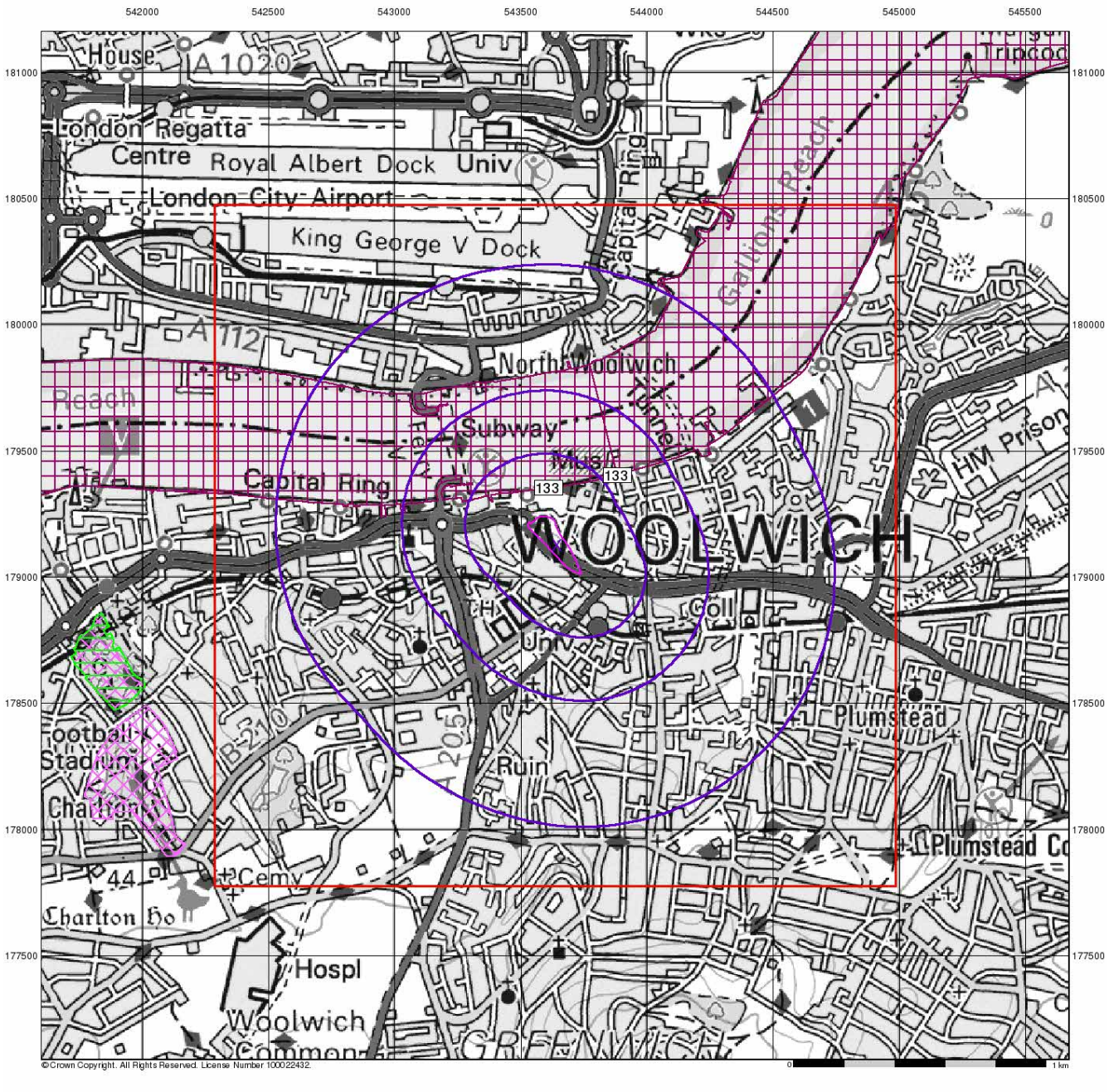
Order Details

Order Number:	83661986_1_1
Customer Ref:	1508005.003
National Grid Reference:	543640, 179130
Slice:	A
Site Area (Ha):	1.71
Search Buffer (m):	1000

Site Details

Phase 18-19, Warren Lane, LONDON

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



TWEEDIE EVANS CONSULTING

Sensitive Land Uses

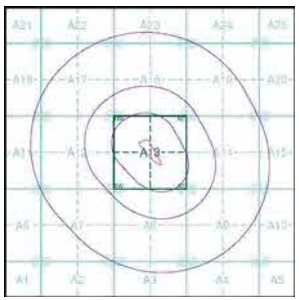
General

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

Sensitive Land Uses

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

Site Sensitivity Context Map - Slice A



N

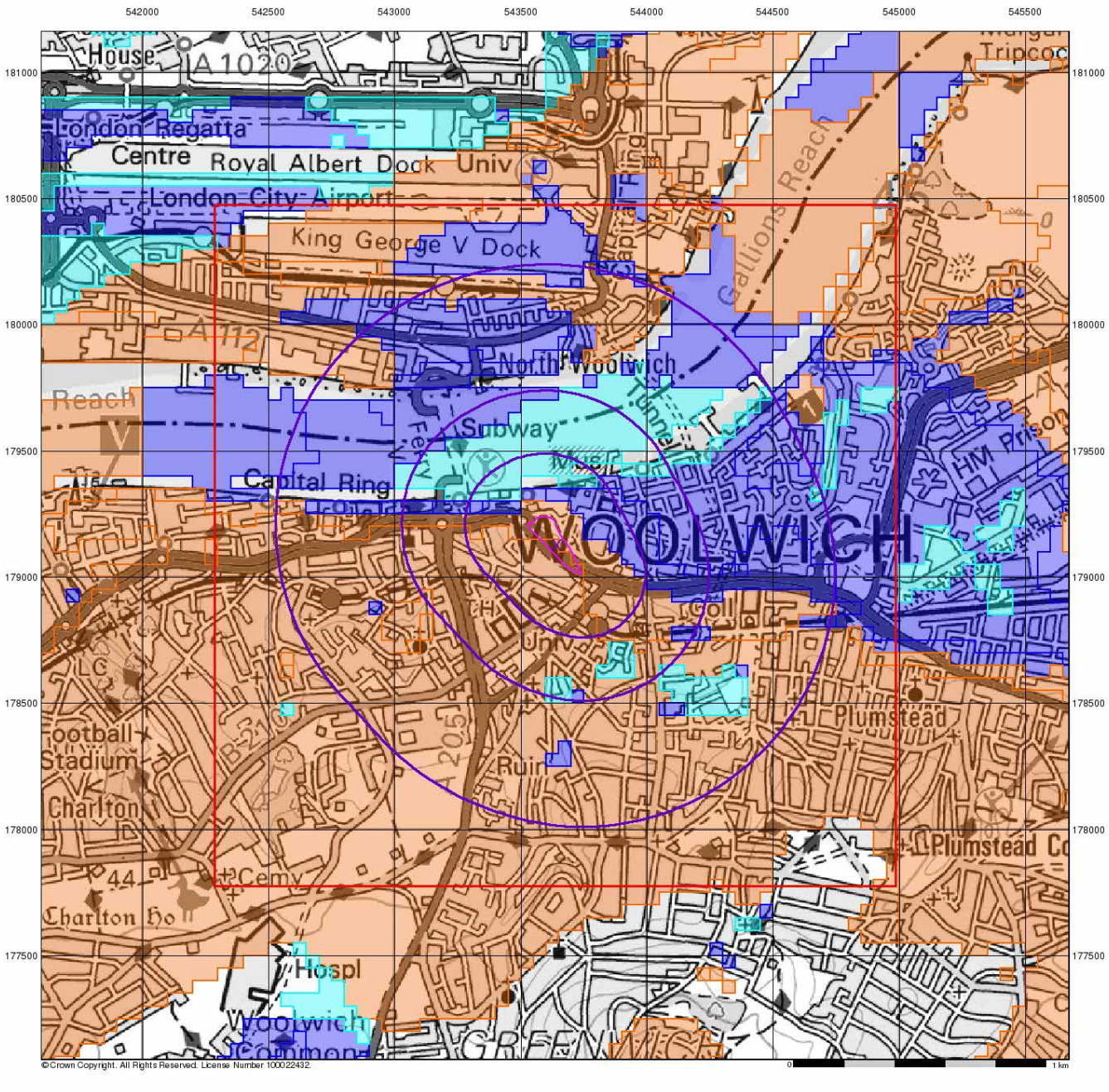
Order Details

Order Number:	83661986_1_1
Customer Ref:	1508005.003
National Grid Reference:	543640, 179130
Slice:	A
Site Area (Ha):	1.71
Search Buffer (m):	1000

Site Details

Phase 18-19, Warren Lane, LONDON

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



TEC

TWEEDIE EVANS CONSULTING

BGS Flood GFS Data

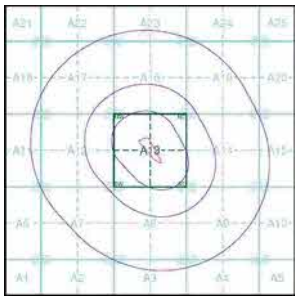
General

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

Agency and Hydrological (Flood)

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

Site Sensitivity Context Map - Slice A



Order Details

Order Number:	83661986_1_1
Customer Ref:	1508005.003
National Grid Reference:	543640, 179130
Slice:	A
Site Area (Ha):	1.71
Search Buffer (m):	1000

Site Details

Phase 18-19, Warren Lane, LONDON

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

APPENDIX D

Regulatory Correspondence

Claire Hooley

From: [redacted]
Sent: Wednesday, April 6, 2016 2:55 PM
To: [redacted]
Subject: RE: Information Request - Royal Arsenal Riverside, Woolwich SE18
Attachments: validation_sampling_report_around_tanks_Dec_07..pdf; Gas_monitoring.pdf

Dear Claire

I do have the following reports in regards to the hotel site Bereford St (Planning Ref: 12/0740/SD) on next link-
http://publicaccess.royalgreenwich.gov.uk/online-applications/applicationDetails.do?activeTab=documents&keyVal=_GRNW_DCAPR_70448

along with a couple of additional documents attached above.

Regards
Mary

[redacted]
Technical Officer Pollution Control
Community Services
Royal Borough of Greenwich

☏ 020 8921 8351
✉ The Woolwich Centre, 35 Wellington Street,
London SE18 6HQ
www.royalgreenwich.gov.uk

From: [redacted]
Sent: 06 April 2016 10:41
To: [redacted]
Subject: RE: Information Request - Royal Arsenal Riverside, Woolwich SE18

Hi [redacted]

I am currently investigating the area known as Phase18-19 at the Royal Arsenal Riverside (I have attached a plan for your reference).

I imagine a lot of the information you kindly provided below will cover most of the potential issues associated with the site but I wondered whether you knew of any other pertinent information I should be aware about with regards to this particular site are?

Many thanks,

[redacted]
Senior Geoenvironmental Consultant

DDI: [redacted]
Mobile:
e-mail:

Tweedie Evans Consulting Limited

The Old Chapel
35a Southover
Wells
Somerset
BA5 1UH

Tel: [redacted]
Fax: [redacted]
www.tecon.co.uk

Save a tree...please don't print this e-mail *unless you really need to*

From: [redacted]
Sent: 19 January 2016 11:52
To: [redacted]
Subject: FW: Information Request - Royal Arsenal Riverside, Woolwich SE18

From: [redacted]
Sent: 19 January 2016 11:02
To [redacted]
Subject: RE: Information Request - Royal Arsenal Riverside, Woolwich SE18

Hi Claire

Please find a response to your questions below:-

1. Pre-license landfill sites:
   No Pre-licensed landfill sites recorded within 500m of subject site. EA may have further information.

2. Pollution incidents/known areas of contaminated land:
   No pollution incidents known. EA may have further information.
   Known areas of contaminated land within 500m. The site is part of the Royal Arsenal Complex which was military land occupied and used for munitions manufacture and testing along with associated industries. This covered a large area of land from Woolwich to Thamesmead. As a result statutory remediation was carried out on some areas prior to development commencing on site. The attached plan and table show Zones statutorily remediated (referred to in the archaeological assessment in outline planning reference 08/1121/O (below).
   http://publicaccess.royalgreenwich.gov.uk/online-applications/applicationDetails.do?activeTab=documents&keyVal=_GRNW_DCAPR_58261
   Gas works and Buzz Bar/transformers located in Riverside area. Gas works investigated in Phase 6 below. No information on Buzz Bar /Transformers area. Royal Arsenal park investigated 1997 (see 6 below).
   Other areas include Mast Quay Woolwich High St investigated and remediated (flats with hard standing) prior to development

3. Part B APC authorisations:
   None within 500m
   Full list of Part B processes can be found on following link:-

http://www.royalgreenwich.gov.uk/downloads/file/477/permitted_processes_in_greenwich_feb_2011

4. Private water supplies:
   No know supplies in the area.

5. Storage of petroleum hydrocarbons:
   Former Petrol Filling Station (closed) – 128 Woolwich High St- Tanks still in place
   Former Petrol Filling Station (closed) - Bereford St opposite Macbean St. Tanks probably still in place
   No other information held. Check with Petroleum Officer.

6. Records of previous site investigations on or in close proximity to the site:-
   The Warren Masterplan (incl Riverside, Teardrop and Royal Arsenal West sites) Planning Ref 08/1121/O refers to Statutory Remediation areas carried out in adjacent areas as per table and plan above,
   and 13/0117/O Warren Masterplan – Environmental Statement Chapter 6 on link below includes numerous reports covering the Warren area – including desk study (Scott Wilson) and sampling information on Riverside 'park area' (1998/9) with site investigation reports in appendices 6.1-6.8
   http://publicaccess.royalgreenwich.gov.uk/online-applications/applicationDetails.do?activeTab=documents&keyVal=_GRNW_DCAPR_72974

   On-going site investigations in Warren Phases 5 (12/1168/F),
   http://publicaccess.royalgreenwich.gov.uk/online-applications/applicationDetails.do?activeTab=documents&keyVal=_GRNW_DCAPR_70877
   and
   Phase 6 (planning ref: 14/3268/SD) adjacent located Warren Riverside Site where gas works and tar tanks were located can be found on the attached link
   http://publicaccess.royalgreenwich.gov.uk/online-applications/applicationDetails.do?activeTab=documents&keyVal=_GRNW_DCAPR_79489

7. Records of any unexploded ordnance in the site area:
   We don't hold records re. unexploded ordnance.

8. Any know problems with ground gas in the site area:
   Crossrail site measured CO2 at CS3 (geology Chalk) however Phase 6 site measured at CS1.

9. Any potential issues regarding naturally elevated contaminant concentrations:
   No known issues.

10. Any other information.

I trust this answers your enquiry

Regards

[redacted]
Contaminated Land Officer Pollution Control
Community Services
Royal Borough of Greenwich

☏ 020 8921 8351
✉ The Woolwich Centre, 35 Wellington Street,

London SE18 6HQ
www.royalgreenwich.gov.uk

From: [redacted]
Sent: 07 January 2016 15:36
To: [redacted]
Subject: Information Request

RE: ROYAL ARSENAL RIVERSIDE, WOOLWICH - PHASE 8

Dear Mary,

I am writing to ask if you could conduct a search for the following details in order for us to complete an environmental review of the above mentioned site. The site is situated off Warren Lane in Woolwich with the centre of the site situated at approximate National Grid Reference 543571, 179287. The nearest postcode is SE18 6BF. I have attached a site plan for your reference.

1. Pre-license landfill sites within 500m of the subject site, including:
   - license holder
   - location of landfill/grid reference
   - nature of fill material
   - dates of operation
   - details of any leachate/landfill gas problems

2. Pollution incidents/known areas of contaminated land within 500m of the subject site, including:
   - location/grid reference
   - previous uses
   - nature/source of pollution
   - any further details

3. Part B APC authorisations within 500m of the subject site, including:
   - authorisation holder
   - location/grid reference
   - nature of authorisation

4. Private water supplies within 500m of the subject site, including:
   - location/grid reference
   - details of source and abstraction purpose

5. Storage of Petroleum Hydrocarbons.

6. Records of any previous Site Investigations on or in close proximity to the site

7. Records of any unexploded ordnance in the site area

8. Any known problems with ground gas in the site area

9. Any potential issues regarding naturally elevated contaminant concentrations

10. Any other information held by your authority which may have an impact upon the contaminative status of the site

I understand there is a charge for this service, please let me know how is best to pay this and I will arrange payment straight away.

If you require any further information please do not hesitate to contact me.

Kind regards

[redacted]
Geoenvironmental Consultant

DDI:
Mobile:

e-mail: [redacted]

Tweedie Evans Consulting Limited
The Old Chapel
35a Southover
Wells
Somerset
BA5 1UH

Tel: 01749 677760
Fax: 01749 679345
www.tecon.co.uk

Save a tree...please don't print this e-mail *unless you really need to*

This message is for the named person's use only. It may contain confidential, proprietary or legally privileged information. No confidentiality or privilege is waived or lost by any mistransmission. If you

SUBADRA

Consultants in the Earth Sciences

Unit 13, Triangle Business Park
Wendover Road, Stoke Mandeville
Bucks HP22 5BL
Tel. 01296 739400
Fax. 01296 739401
e-mail: consultants@subadra.com
www.subadra.com

[redacted]
Wooldridge Ecotec Ltd
Hall Grove Farm
Bagshot
Surrey
GU19 5HP

Ref : IN07659 CL 011

12th December 2007

[redacted]**on Sampling Report - Teardrop Site, Woolwich**

Please find below details and results of the validation sampling we undertook at the Teardrop site in Woolwich.

We attended site on the 12th and 13th November 2007 to recover soil samples from the sides and bases of excavations undertaken by your appointed contractor. We recovered a total of twenty six soil samples from three excavations. Each sample was analysed by a UKAS accredited laboratory for banded Total Petroleum Hydrocarbons (TPH).

The locations we took the samples are displayed on Figure One in Attachment One, The results of analysis are included as Laboratory Certificates in Attachment Two.

I trust that the above will be sufficient for your immediate needs. If you have any questions please contact me directly on 01296 739446.

Yours sincerely

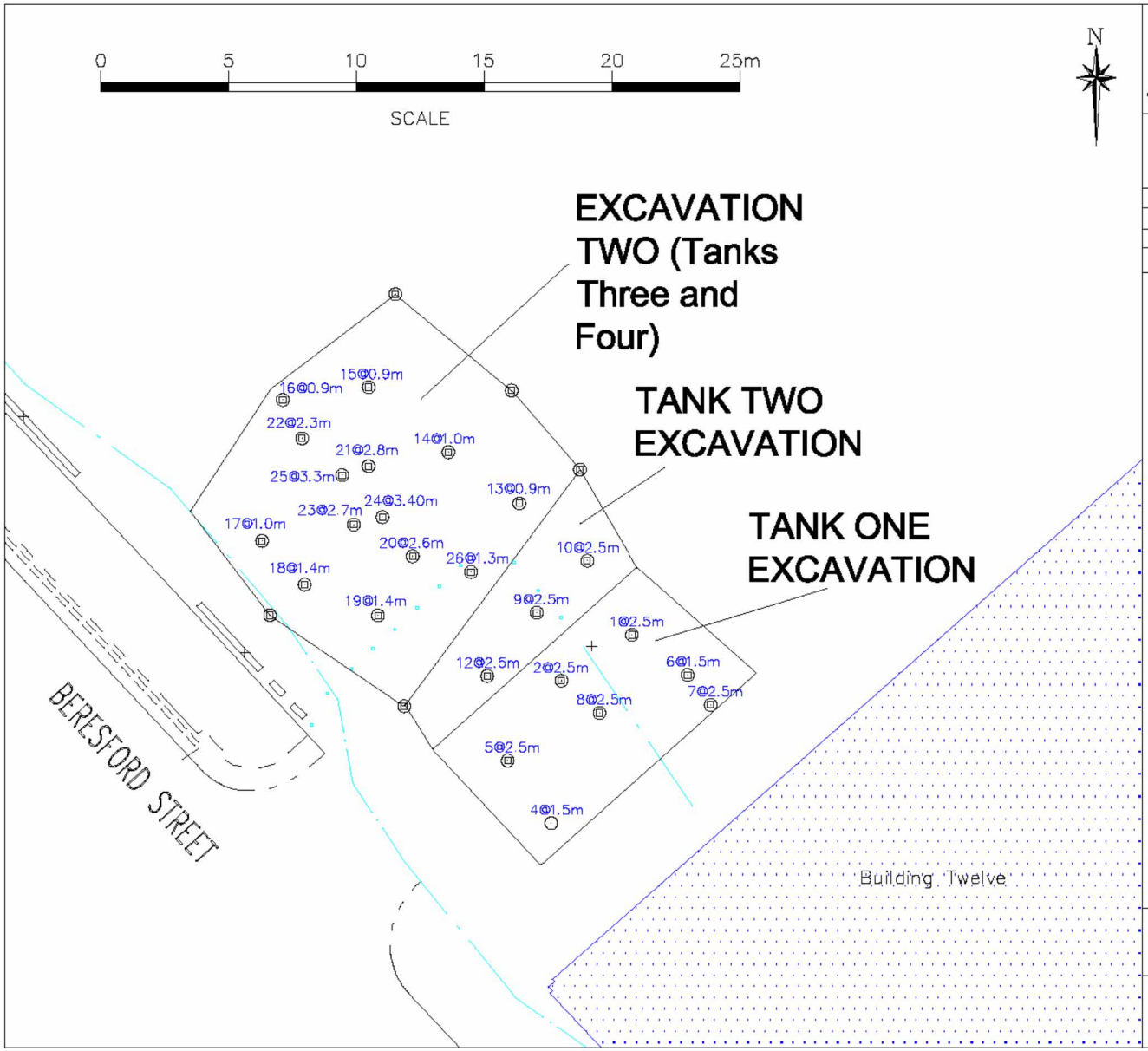
[redacted]

Subadra Consulting Limited

Enc Attachment One – Sample Locations

Attachment Two – Laboratory Certificates

Attachment One: Sample Locations



SUBADRA
Unit 13, Triangle Business Park
Stoke Mandeville, Bucks HP22 5BL
Tel. 01296 739400 Fax. 01296 739401

TEARDROP SITE
BERESFORD STREET
WOOLWICH

DATE : DECEMBER 2007

SUBADRA ARCHIVE NO : IN07659 DR 011

DRAWING BY : TA | CHECKED BY : DE

KEY

TANK EXCAVATION SAMPLE LOCATIONS

FIGURE ONE

Attachment Two: Analysis Certificates

SUBADRA

Consultants in the Earth Sciences

Unit 13, Triangle Business Park
Wendover Road, Stoke Mandeville
Bucks HP22 5BL
Tel. 01296 739400
Fax. 01296 739401
e-mail: consultants@subadra.com

Laboratory Analysis Report

Report Number 001055

Sampling Date 12th November2007

Report Date 05th December2007

Client	Site Name/Address
Wooldridge Ecotec Ltd Hall Grove Farm Bagshot Surrey GU19 5HP	Teardrop Site, Woolwich Arsenal Beresford Street Woolwich London

Number of Samples	Sample Type	Analysis Completed	Blind Testing	UKAS	MCERTS
12	Soil	SOP QP13 based on TNRCC 1005 by GC-FID	No	Yes	No

Please note these results relate only to the items tested.
SOP QP 13: In-House TPH Banded method C8 - C35 - Solvent extraction using pentane then Liquid injection into GC-FID. Analysis determined by comparison to SUP MDRO standard.
Samples prepared 13-11-07 and analyzed 14-11-07. Due to a technical fault data was not collected for sample 7.

Analysis Report Approved By

[redacted]

Duty Reporting Manager

UKAS TESTING
2628

Summary of Results

TPH Banded - Soil

Accreditation	UKAS	Blind Testing	No		
Results Reported As	Wet Weight	Last Three Z Scores	N/A	N/A	N/A

Analysis Method Parameters			
Reporting Units	mg/kg	Limit of Detection	0.05mg/kg
Linearity	2,000mg/kg	Limit of Quantification	0.1mg/kg
Sensitivity	0.1mg/kg	Precision	+/-0.1mg/kg

Sample Location	Sample	Depth	Total Petroleum Hydrocarbons				
			C8-C10	>C10-C12	>C12-C16	>C16-C21	>C21-C35
Tank 1 - NorthEast/1	sin07659.001001	2.50	<1	<1	<1	2.11	28.1
Tank 1 - NorthWest/2	sin07659.001002	2.50	<1	<1	<1	8.63	88.4
Tank 1 - Slurry/3	sin07659.001003	0.00	<1	<1	<1	<1	3.67
Tank 1 - West/4	sin07659.001004	1.50	24.1	14.5	<1	<1	3.69
Tank 1 - West/5	sin07659.001005	2.50	816	177	27.0	19.0	98.6
Tank 1 - East/6	sin07659.001006	1.50	<1	<1	<1	<1	13.8
Tank 1 - East/7	sin07659.001007	2.50	NA	NA	NA	NA	NA
Tank 1 - Base/8	sin07659.001008	2.50	<1	<1	<1	1.04	2.89
Tank 2 - Base/9	sin07659.001009	2.50	<1	<1	<1	<1	<1
Tank 2 - East/10	sin07659.001010	2.50	<1	<1	<1	<1	<1
Tank 2 - Slurry/11	sin07659.001011	0.00	30.0	11.0	<1	<1	<1
Tank 2 - West/12	sin07659.001012	2.50	2.49	<1	2.97	23.2	192

SUBADRA

Consultants in the Earth Sciences

Unit 13, Triangle Business Park
Wendover Road, Stoke Mandeville
Bucks HP22 5BL
Tel. 01296 739400
Fax. 01296 739401
e-mail: consultants@subadra.com

Laboratory Analysis Report

Report Number 001059

Sampling Date 13th November2007

Report Date 06th December2007

Client	Site Name/Address
Wooldridge Ecotec Ltd Hall Grove Farm Bagshot Surrey GU19 5HP	Teardrop Site, Woolwich Arsenal Beresford Street Woolwich London

Number of Samples	Sample Type	Analysis Completed	Blind Testing	UKAS	MCERTS
14	Soil	SOP QP13 based on TNRCC 1005 by GC-FID	No	Yes	No

Please note these results relate only to the items tested.
SOP QP 13: In-House TPH Banded method C8 - C35 - Solvent extraction using pentane then Liquid injection into GC-FID. Analysis determined by comparison to SUP MDRO standard.
Samples were incorrectly prepared 14-11-07 and were therefore reprepared 26-11-07 and analyzed 27-11-07.

Analysis Report Approved By

[redacted]

Katherine Powell

Duty Reporting Manager

UKAS TESTING
2628

Summary of Results

TPH Banded - Soil

Accreditation	UKAS	Blind Testing	No		
Results Reported As	Wet Weight	Last Three Z Scores	N/A	N/A	N/A

Analysis Method Parameters			
Reporting Units	mg/kg	Limit of Detection	0.05mg/kg
Linearity	2,000mg/kg	Limit of Quantification	0.1mg/kg
Sensitivity	0.1mg/kg	Precision	+/-0.1mg/kg

Sample Location	Sample	Depth	Total Petroleum Hydrocarbons				
			C8-C10	>C10-C12	>C12-C16	>C16-C21	>C21-C35
EX2-NE/S13	SIN07659.002001	0.90	18.4	29.7	113	94.9	113
EX2-NE/S14	SIN07659.002002	1.00	3.77	14.3	81.6	79.8	111
EX2-NE/S15	SIN07659.002003	0.90	<1	<1	8.06	33.7	86.1
EX2-NW/S16	SIN07659.002004	0.90	<1	<1	11.3	47.1	111
EX2-SW/S17	SIN07659.002005	1.00	2.57	6.76	39.0	54.9	167
EX2-SW/S18	SIN07659.002006	1.40	6.2	19.6	86.5	74.5	96.7
EX2-SW/S19	SIN07659.002007	1.40	9.54	23.8	96.8	93.7	118
EX2-SE/S20	SIN07659.002008	2.60	27.9	37.8	111	93.7	118
EX2-NE/S21	SIN07659.002009	2.80	5.79	16.2	51.8	51.0	96.0
EX2-NW/S22	SIN07659.002010	2.30	<1	<1	3.3	15.0	99.5
EX2-SW/S23	SIN07659.002011	2.70	10.3	24.2	114	91.7	100
EX2-BASE/S24	SIN07659.002012	3.40	<1	<1	<1	<1	5.38
EX2-BASE/S25	SIN07659.002013	3.30	<1	<1	<1	<1	1.49
EX2-SE/S26	SIN07659.002014	1.30	19.4	44.6	201	154	76.2

MLM

www.mlm.uk.com

Soil-Gas & Groundwater Monitoring / Sampling Site Data

						Calibrated / Checked		Logged in QA File
Date	15/02/12	**Project**	Teardrop			**Before**	**After**	
Time	09/01/00	**Project Number**	05/05/81	**Equipment Used**	GFM 435 Dip Meter P.I.D.	Yes	Yes	Yes
Technician	Vicky Rowe	**Weather**						

Notes:
Pressure Falling

Well No. / Location	CH_4 (%)	CO_2 (%)	O_2 (%)	Pressure (mbar)	Flow (l/hr)	Average VOC (ppm)	Peak VOC (ppm)	Instrument Accuracy Check	Height of Casing (m)	Depth to Water (mb casing)	Depth to base of well (mbgl)	Sample Collected (Y/N)	Comments and Visual/Olfactory Description of Sample Collected
BH1	<0.1	0.7	18.2	1026	<0.1	3.0	7.6	YES			9.44	N	Dry
BH2	<0.1	<0.1	19.6	1026	<0.1	2.2	6.0	YES		9.78	9.83	N	
BH3	<0.1	<0.1	19.8	1025	<0.1	1.1	8.5	YES			9.51	N	Dry
Amb	<0.1	<0.1	20.6	1026		<0.1	<0.1	YES				N	

note: if a zero value was recorded this is more accurately described as a recorded value below the limit of detection of the equipment used.

MLM

www.mlm.uk.com

Soil-Gas & Groundwater Monitoring / Sampling Site Data

						Calibrated / Checked		Logged in QA File
Date	22/02/12	**Project**	Teardrop			**Before**	**After**	
Time	10.55am	**Project Number**	05/05/81	**Equipment Used**	GFM 435 Dip Meter P.I.D.	Yes	Yes	Yes
Technician	Vicky Rowe	**Weather**	Overcast Dry					

Notes:

Well No. / Location	CH_4 (%)	CO_2 (%)	O_2 (%)	Pressure (mbar)	Flow (l/hr)	Average VOC (ppm)	Peak VOC (ppm)	Instrument Accuracy Check	Height of Casing (m)	Depth to Water (mb casing)	Depth to base of well (mbgl)	Sample Collected (Y/N)	Comments and Visual/Olfactory Description of Sample Collected
BH1	<0.1	0.7	20.0	1025	<0.1	3.2	7.7	YES			9.45	N	Dry
BH2	<0.1	0.3	19.2	1025	<0.1	2.2	6.2	YES		9.79	9.83	N	
BH3	<0.1	0.1	19.8	1024	<0.1	1.3	1.5	YES			9.51	N	Dry
Amb	<0.1	<0.1	20.6	1024		1.4	1.9	YES				N	

note: if a zero value was recorded this is more accurately described as a recorded value below the limit of detection of the equipment used.

MLM www.mlm.uk.com	Date	07.03.12	Project	Teardrop			Calibrated / Checked		Logged in QA File
	Time	1.30pm	Project Number	723672	Equipment Used	GFM 435 Dip Meter P.I.D.	Before	After	
	Technician	Vicky Rowe	Weather	Wet and windy			Yes	Yes	Yes

Notes:

Well No. / Location	CH_4 (%)	CO_2 (%)	O_2 (%)	Pressure (mbar)	Flow (l/hr)	Average VOC (ppm)	Peak VOC (ppm)	Instrument Accuracy Check	Height of Casing (m)	Depth to Water (mb casing)	Depth to base of well (mbgl)	Sample Collected (Y/N)	Comments and Visual/Olfactory Description of Sample Collected
BH1	<0.1	1.1	18.6	1008	<0.1	2.2	5.7	YES			9.45	N	Dry
BH2	<0.1	0.5	19.5	1008	<0.1	2.2	5.6	YES		9.81	9.83	N	
BH3	<0.1	0.1	20.2	1010	<0.1	1.6	1.8	YES			9.51	N	Dry
Amb	<0.1	<0.1	20.6	1008		0.4	0.4	YES				N	

note: if a zero value was recorded this is more accurately described as a recorded value below the limit of detection of the equipment used.

APPENDIX E

Risk Evaluation

Risk Evaluation

The qualitative assessment methodology presented in Ciria publication C552 (2001) titled 'Contaminated Land Risk Assessment: A Guide to Good Practice' has been used by TEC for the basis of evaluating potential risk.

The method requires an assessment of the:

- magnitude of the probability or likelihood of the risk occurring (Table 1); and
- magnitude of the potential consequence or severity of the risk occurring (Table 2)

Table 1. Classification of Probability

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

Table 2. Classification of Consequence

Classification	Definition	Examples
Severe	Short-term (acute) risk to human health likely to result in "significant harm" as defined by the Environment Protection Act 1990, Part IIA. Short-term risk of pollution of sensitive water resource. (Note: Water Resources Act contains no scope for considering significance of pollution). Catastrophic damage to buildings/property. A short-term risk to a particular ecosystem, or organisation forming part of such ecosystem (note: the definitions of ecological systems within the draft circular on Contaminated Land, DETR, 2000).	High concentrations of cyanide on the surface of an informal recreation area. Major spillage of contaminants from site into controlled water. Explosion, causing building collapse (can also equate to a short-term human health risk if buildings are occupied).
Medium	Chronic damage to human health ("significant harm" as defined in DETR, 2000). Pollution of sensitive water resources. (Note: Water Resources Act contains no scope for considering significance of pollution). A significant change in a particular ecosystem, or organism forming part of such ecosystem, (note: the definitions of ecological systems within draft circular on Contaminated Land, DETR, 2000).	Concentration of a contaminant from site exceeding the generic or site-specific assessment criteria. Leaching of contaminants from a site to a major or minor aquifer. Death of a species within a designated nature reserve.
Mild	Pollution of non-sensitive water resources. Significant damage to crops, buildings, structures and services ("significant harm" as defined in the draft circular on Contaminated Land, DETR, 2000). Damage to sensitive buildings/structures/services or the environment.	Pollution of non-classified groundwater. Damage to building rendering it unsafe to occupy (for example foundation damage resulting in instability).
Minor	Harm, although not necessarily significant harm, which may result in a financial loss, or expenditure to resolve. Non-permanent health effects to human health (easily prevented by means such as personal protective clothing etc), easily repairable effects of damage to buildings, structures and services.	The presence of contaminants at such concentrations that protective equipment is required during site works. The loss of plants in a landscaping scheme. Discolouration of concrete.

The combination of the two factors is determined using Table 3 and the resulting level of risk is described in Table 4. The evaluation can be applied to each of the scenarios identified in the risk model and the overall risk assessed.

Table 3. Combination of Consequence with Probability

		Consequence			
		Severe	Medium	Mild	Minor
Probability	High Likelihood	Very High Risk	High Risk	Moderate Risk	Moderate/Low Risk
	Likely	High Risk	Moderate Risk	Moderate/Low Risk	Low Risk
	Low Likelihood	Moderate Risk	Moderate/Low Risk	Low Risk	Very Low Risk
	Unlikely	Moderate/Low Risk	Low Risk	Very Low Risk	Very Low Risk

Table 4. Description of risks and likely action required

Very High Risk	There is a high probability that severe harm could arise to a designated receptor from an identified hazard, or there is evidence that severe harm to a designated receptor is currently happening. This risk, if realised, is likely to result in a substantial liability. Urgent investigation (if not undertaken already) and remediation are likely to be required.
High Risk	Harm is likely to arise to a designated receptor from an identified hazard. Realisation of the risk is likely to present a substantial liability. Urgent investigation (if not undertaken already) is required and remedial works may be necessary in the short-term and are likely over the longer-term.
Moderate Risk	It is possible that harm could arise to a designated receptor from an identified hazard. However, it is either relatively unlikely that any such harm would be severe, or if any harm were to occur it is more likely that the harm would be relatively mild. Investigation (if not already undertaken) is normally required to clarify the risk and to determine the potential liability. Some remedial works may be required in the long-term.
Low Risk	It is possible that harm could arise to a designated receptor from an identified hazard, but it is likely that this harm, if realised, would at worst normally be mild.
Very Low Risk	There is a low possibility that harm could arise to a receptor. In the event of such harm being realised it is not likely to be severe.

Using the risk model the pollutant linkages are identified and a preliminary estimate of risk undertaken. If there is no pollutant linkage identified, then there is no risk. If the estimate of risk for all the linkages and exposure scenarios is very low at this stage then it is likely that no further assessment will be required.

APPENDIX F

Exploratory Hole Logs

CABLE PERCUSSIVE BOREHOLE RECORD

Project Title: Royal Arsenal Riverside - Phase 18-19	Borehole: BH01
Project No: 1508005.003	Dates: 07 March 2016
Client: Berkeley Homes (East Thames) Limited	

TWEEDIE EVANS CONSULTING
www.tecon.co.uk
info@tecon.co.uk

Depth (m)	Description	Legend	Sample Details	Depth (m)	SPT Results: Blow Count	SPT Results: N Value	Remarks/ Data	Installation
0.00	Ground Surface			0.0				
	MADE GROUND Brown slightly silty gravelly cobbly sand. Gravel and cobbles of red brick, yellow brick and concrete and gravel of sandstone, black carbonaceous material and clinker with occasional fragment of clay pipe.			1.0 2.0 3.0 4.0 5.0 6.0 7.0 8.0 9.0 10.0				

Notes:

- A: 250ml and 60ml Amber Glass Jars
- T: Plastic Tub (1Kg)
- B: Bulk Sample
- U: Undisturbed Sample
- SPT: Standard Penetration Test
- HSV: Hand Shear Vane
- PP: Pocket Penetrometer

Plant: Dando 2000

Water observations: No groundwater was encountered.

General remarks:
Borehole terminated at a depth of 0.55mbgl due to the presence of a cable

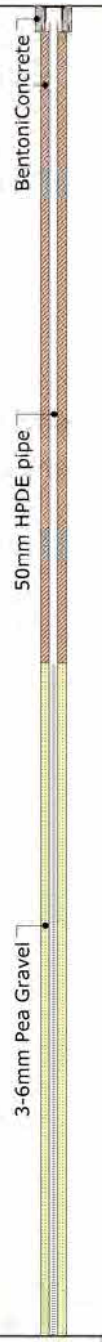
Logged by: CH	Checked by: ET	Approved by: RE

CABLE PERCUSSIVE BOREHOLE RECORD

Project Title: Royal Arsenal Riverside - Phase 18-19	Borehole: BH01a
Project No: 1508005.003	Dates: 07 March 2016
Client: Berkeley Homes (East Thames) Limited	

TWEEDIE EVANS CONSULTING
www.tecon.co.uk
info@tecon.co.uk

Depth (m)	Description	Legend	Sample Details	Depth (m)	SPT Results: Blow Count	SPT Results: N Value	Remarks/ Data	Installation
	Ground Surface			0.0				
	MADE GROUND Brown slightly silty slightly clayey sandy gravel and cobbles of red brick and concrete and gravel of ceramic and glass. ...Red brick obstruction encountered from 0.7mbgl - 1.0mbgl.			1.0				
1.80								
2.20	MADE GROUND Brown locally light brown slightly clayey gravelly sand. Gravel of chert, red brick and black carbonaceous material. ...Localised pockets of yellow sand throughout.			2.0	(14) 15, 15, 12, 8/25mm	>50		
				3.0	(6) 4, 5, 6, 8	23		
3.60	Light brown sandy GRAVEL of rounded to sub-rounded chert.							
	Light brown slightly silty fine to medium glauconitic SAND.			4.0	(7) 9, 20, 24, 6/5mm	>50		
				5.0	(12) 10, 25, 25/60mm	>50		
				6.0				
				7.0	(10) 27, 22/45mm	>50		
				8.0	(10) 18, 24, 3/2mm	>50		
				9.0				
				10.0	(9) 10, 21, 19/50mm	>50		



Notes:

A:	250ml and 60ml Amber Glass Jars
T:	Plastic Tub (1Kg)
B:	Bulk Sample
U:	Undisturbed Sample
SPT:	Standard Penetration Test
HSV:	Hand Shear Vane

Plant: Dando 2000

Water observations:

General remarks:

Logged by: CH | Checked by: ET | Approved by: RE

CABLE PERCUSSIVE BOREHOLE RECORD

Project Title: Royal Arsenal Riverside - Phase 18-19	Borehole: BH01a
Project No: 1508005.003	Dates: 07 March 2016
Client: Berkeley Homes (East Thames) Limited	

TWEEDIE EVANS CONSULTING
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Depth (m)	Description	Legend	Sample Details	Depth (m)	SPT Results: Blow Count	SPT Results: N Value	Remarks/ Data	Installation
				11.0	(10) 10, 15, 25/30mm	>50		
				12.0				
					(12) 21, 21, 9/5mm	>50		
				13.0				
				14.0	(15) 15, 17, 18/35mm	>50		
15.00								
	Light brown sandy GRAVEL of rounded chert.			15.0				
					(25/34mm) 25, 25/40mm	>50		
16.20				16.0				
	Weak, low to medium-density, white locally speckled black CHALK with moderate gravel and cobbles of angular to sub-rounded flint.				(9) 7, 10, 10, 7	34		
				17.0				
				18.0	(9) 4, 6, 6, 8	24		
				19.0				
					(11) 3, 3, 4, 6	16		
				20.0				

Notes:

- A: 250ml and 60ml Amber Glass Jars
- T: Plastic Tub (1Kg)
- B: Bulk Sample
- U: Undisturbed Sample
- SPT: Standard Penetration Test
- HSV: Hand Shear Vane

Plant: Dando 2000

Water observations:

General remarks:

Logged by: CH	Checked by: ET	Approved by: RE

CABLE PERCUSSIVE BOREHOLE RECORD

Project Title: Royal Arsenal Riverside - Phase 18-19	Borehole: BH01a
Project No: 1508005.003	Dates: 07 March 2016
Client: Berkeley Homes (East Thames) Limited	

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Depth (m)	Description	Legend	Sample Details	Depth (m)	SPT Results: Blow Count	SPT Results: N Value	Remarks/ Data	Installation
21.50	Borehole Terminated			21.0	(17) 11, 17, 22/50mm	>50		
				22.0				
				23.0				
				24.0				
				25.0				
				26.0				
				27.0				
				28.0				
				29.0				
				30.0				

Notes:

- A: 250ml and 60ml Amber Glass Jars
- T: Plastic Tub (1Kg)
- B: Bulk Sample
- U: Undisturbed Sample
- SPT: Standard Penetration Test
- HSV: Hand Shear Vane

Plant: Dando 2000

Water observations:

General remarks:

Logged by: CH	Checked by: ET	Approved by: RE

DYNAMIC SAMPLING RECORD

Project Title: Royal Arsenal Riverside - Phase 18-19	Borehole: WS01
Project No: 1508005.003	Dates: 03 March 2016 - 04 March 2016
Client: Berkeley Homes (East Thames) Limited	

TWEEDIE EVANS CONSULTING
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Depth (m)	Description	Legend	Sample Details	Depth (m)	SPT Results: Blow Count	SPT Results: N Value	Remarks/ Data	Installation
0.00	Ground Surface			0.0				
0.20	MADE GROUND Brown gravelly sandy clay. Gravel of red brick, chert and clinker.						PID (ppm) Results	
0.65	MADE GROUND Dark brown to black slightly clayey sandy gravel of concrete, chert and black carbonaceous material.		A				PID = 0.00	
	MADE GROUND Yellowish brown locally light brown gravelly sand. Gravel of chert.						PID = 0.00	
1.20	MADE GROUND Brown locally light brown and yellowish brown gravelly sandy clay with occasional pocket of gravelly sand. Gravel of chert, red brick, black carbonaceous material, concrete and yellow brick.			1.0	(1, 1) 2, 4, 9, 7	22		
1.60	MADE GROUND Yellowish brown to light brown locally reddish brown gravelly sand. Gravel of red brick, chert and concrete.							
2.10	MADE GROUND Brown slightly silty gravelly sandy clay. Gravel of chert and occasional red brick.			2.0	(3, 4) 5, 5, 5, 6	21		
	Medium dense becoming very dense light brown gravelly fine to medium SAND. Gravel of rounded to sub-angular chert.							
3.00	Borehole Terminated			3.0	(12, 12) 14, 13, 13, 12	>50		
				4.0				
				5.0				

Notes:

A: 250ml and 60ml Amber Glass Jars
T: Plastic Tub (1Kg)
SPT: Standard Penetration Test
HSV: Hand Shear Vane
PP: Pocket Penetrometer
PID: Photo-Ionisation Detector

Plant: Archway Dart

Water observations: No groundwater was encountered.

General remarks:
Borehole terminated at 3.0mbgl due to effective refusal on very dense gravelly sand.

Logged by: CH	Checked by: ET	Approved by: RE

DYNAMIC SAMPLING RECORD

Project Title: Royal Arsenal Riverside - Phase 18-19	Borehole: WS02
Project No: 1508005.003	Dates: 04 March 2016
Client: Berkeley Homes (East Thames) Limited	

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Depth (m)	Description	Legend	Sample Details	Depth (m)	SPT Results: Blow Count	SPT Results: N Value	Remarks/ Data	Installation
0.00	Ground Surface			0.0				
0.10	MADE GROUND Brown slightly silty sandy clay. Gravel of red rick, chert and concrete.							
	Borehole Terminated			1.0				
				2.0				
				3.0				
				4.0				
				5.0				

Notes:

- A: 250ml and 60ml Amber Glass Jars
- T: Plastic Tub (1Kg)
- SPT: Standard Penetration Test
- HSV: Hand Shear Vane
- PP: Pocket Penetrometer
- PID: Photo-Ionisation Detector

Plant: Archway Dart

Water observations: No groundwater was encountered.

General remarks:

Borehole terminated at a depth of 0.1mbgl due to the presence of a concrete obstruction.

Logged by: CH	Checked by: ET	Approved by: RE

DYNAMIC SAMPLING RECORD

Project Title: Royal Arsenal Riverside - Phase 18-19	Borehole: WS03
Project No: 1508005.003	Dates: 04 March 2016
Client: Berkeley Homes (East Thames) Limited	

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Depth (m)	Description	Legend	Sample Details	Depth (m)	SPT Results: Blow Count	SPT Results: N Value	Remarks/ Data	Installation
0.00	Ground Surface			0.0				
0.60	MADE GROUND Brown locally light brown and grey slightly silty gravelly sand, Gravel of red brick, concrete, yellow brick, chert, breeze block and clinker.		A				PID (ppm) Results PID = 0.00	
1.50	MADE GROUND Black locally dark brown and yellow clayey sandy gravel of red brick, charcoal, chalk, ceramic, flint, slate and yellow brick.			1.0	(2, 1) 1, 1, 1, 1	4	PID = 0.00	
2.50	MADE GROUND Light brown gravelly sand. Gravel of chert and rare red brick and black carbonaceous material.			2.0	(1, 0) 0, 0, 0, 1	1		
3.00	Medium dense light brown to orange brown gravelly fine to medium SAND. Gravel of rounded to sub-angular chert.			3.0	(5, 4) 4, 4, 4, 5	17		
5.00	Medium dense to very dense light brown to pale brown locally orange fine glauonitic SAND.			4.0	(5, 6) 8, 10, 12, 18	48		
				5.0				

Notes:

A: 250ml and 60ml Amber Glass Jars
T: Plastic Tub (1Kg)
SPT: Standard Penetration Test
HSV: Hand Shear Vane
PP: Pocket Penetrometer
PID: Photo-Ionisation Detector

Plant: Archway Dart

Water observations: No groundwater was encountered.

General remarks:

Logged by: CH	Checked by: ET	Approved by: RE

DYNAMIC SAMPLING RECORD

Project Title: Royal Arsenal Riverside - Phase 18-19	Borehole: WS04
Project No: 1508005.003	Dates: 04 March 2016
Client: Berkeley Homes (East Thames) Limited	

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Depth (m)	Description	Legend	Sample Details	Depth (m)	SPT Results: Blow Count	SPT Results: N Value	Remarks/ Data	Installation
0.00	Ground Surface			0.0				
	MADE GROUND Brown locally light brown, yellow and black slightly clayey slightly silty gravelly sand. Gravel of red brick, concrete, chert, clinker and black carbonaceous material and rare cobble of clinker.		A				PID (ppm) Results PID = 0.00	
0.50								
0.70	MADE GROUND Gravel and cobble of concrete and yellow brick.		A				PID = 68.2	
	MADE GROUND Dark brown locally black and light brown gravelly silty sand. Gravel of mudstone, chert, red brick, concrete and clinker. ....Hydrocarbon odour noted at 0.8-1.0mbgl.			1.0	(2, 3) 5, 4, 5, 5	19	PID = 54.2 PID = 4.0	
1.95								
	MADE GROUND Light brown to brown gravelly sand. Gravel of chert and rare red brick.			2.0	(2, 4) 4, 5, 6, 5	20		
2.20								
	Medium to to very dense light brown to orangish brown gravelly fine to medium SAND. Gravel of angular to sub-rounded chert.							
3.00				3.0	(9, 11) 11, 12, 13, 14	50		
	Very dense light brown to pale brown slightly silty fine SAND.							
4.00				4.0				
	Borehole Terminated							
				5.0				

Notes:

A: 250ml and 60ml Amber Glass Jars
T: Plastic Tub (1Kg)
SPT: Standard Penetration Test
HSV: Hand Shear Vane
PP: Pocket Penetrometer
PID: Photo-Ionisation Detector

Plant: Archway Dart

Water observations: No groundwater was encountered.

General remarks:

Borehole terminated due to refusal on very dense sand.

Logged by: CH	Checked by: ET	Approved by: RE

DYNAMIC SAMPLING RECORD

Project Title: Royal Arsenal Riverside - Phase 18-19	Borehole: WS05
Project No: 1508005.003	Dates: 04 March 2016
Client: Berkeley Homes (East Thames) Limited	

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Depth (m)	Description	Legend	Sample Details	Depth (m)	SPT Results: Blow Count	SPT Results: N Value	Remarks/ Data	Installation
0.00	Ground Surface			0.0				
0.40	MADE GROUND Light brown to pinkish brown slightly clayey sandy gravel of limestone, chert and occasional red brick.						PID (ppm) Results	
1.50	MADE GROUND Brown slightly clayey gravelly silty sand. Gravel of chert, black carbonaceous material and red brick.		A	1.0	(3, 4) 4, 2, 1, 1	8	PID = 0.00	
1.90	Loose light brown locally orange slightly gravelly fine to medium SAND. Gravel of angular to sub-rounded chert.							
2.50	Loose brown to light brown locally grey slightly silty fine SAND with occasional gravel of angular to sub-rounded chert.			2.0	(2, 1) 2, 1, 1, 2	6		
2.95	Loose light brown to pale brown fine SAND.							
	Loose brown slightly gravelly SAND. Gravel of fine rounded to sub-rounded chert.			3.0	(2, 2) 1, 1, 2, 1	5		
4.40	Loose light brown to yellowish brown locally grey and orange slightly silty fine SAND.			4.0	(0, 0) 1, 0, 0, 1	2		
4.50	Very dense light brown to pale brown fine glauconitic SAND.							
	Borehole Terminated			5.0				

Notes:

A: 250ml and 60ml Amber Glass Jars
T: Plastic Tub (1Kg)
SPT: Standard Penetration Test
HSV: Hand Shear Vane
PP: Pocket Penetrometer
PID: Photo-Ionisation Detector

Plant: Archway Dart

Water observations: No groundwater was encountered.

General remarks:

Borehole terminated at 4.5mbgl due to refusal on very dense sand.

Logged by: CH	Checked by: ET	Approved by: RE

DYNAMIC SAMPLING RECORD

Project Title: Royal Arsenal Riverside - Phase 18-19	Borehole: WS06
Project No: 1508005.003	Dates: 05 March 2016
Client: Berkeley Homes (East Thames) Limited	

TWEEDIE EVANS CONSULTING
www.tecon.co.uk
info@tecon.co.uk

Depth (m)	Description	Legend	Sample Details	Depth (m)	SPT Results: Blow Count	SPT Results: N Value	Remarks/ Data	Installation
0.00	Ground Surface			0.0				
0.10	MADE GROUND Tarmacadam hardstanding.						PID (ppm) Results	
	MADE GROUND Light brown to pinkish brown locally reddish brown clayey sandy gravel of limestone, concrete, chert and red brick.						PID = 0.00	
0.80	MADE GROUND Reddish brown silty sandy gravel of red brick, clinker, concrete and yellow brick. Occasional cobble of red brick.		A	1.0	(1, 0) 1, 2, 1, 1	5		
1.90	Loose becoming medium dense greyish brown to light brown slightly gravelly silty SAND. Gravel of angular to sub-rounded chert. ...Localised pockets of black organic material.			2.0	(1, 0) 1, 0, 1, 0	2	PID = 0.00	
3.50	Very dense light brown to pale brown fine glauconitic SAND.			3.0	(1, 2) 3, 4, 5, 6	18		
4.00	Borehole Terminated			4.0	(7, 7) 10, 12, 18, 20	>50		
				5.0				

Notes:

A: 250ml and 60ml Amber Glass Jars
T: Plastic Tub (1Kg)
SPT: Standard Penetration Test
HSV: Hand Shear Vane
PP: Pocket Penetrometer
PID: Photo-Ionisation Detector

Plant: Archway Dart

Water observations: Minor groundwater ingress encountered at 2.5mbgl.

General remarks:

Borehole terminated at 4.0mbgl due to refusal on very dense sand.

Logged by: CH	Checked by: ET	Approved by: RE

DYNAMIC SAMPLING RECORD

Project Title: Royal Arsenal Riverside - Phase 18-19	Borehole: WS07
Project No: 1508005.003	Dates: 05 March 2016
Client: Berkeley Homes (East Thames) Limited	

TWEEDIE EVANS CONSULTING
www.tecon.co.uk
info@tecon.co.uk

Depth (m)	Description	Legend	Sample Details	Depth (m)	SPT Results: Blow Count	SPT Results: N Value	Remarks/ Data	Installation
0.00	Ground Surface			0.0				
0.16	MADE GROUND Tarmacadam hardstanding.						PID (ppm) Results PID = 0.00	
0.40	MADE GROUND Greyish brown locally reddish brown and yellow slightly clayey sandy gravel and cobbles of red brick, yellow brick and concrete and gravel of sandstone, chert and black carbonaceous material.		A					
	MADE GROUND Brown to dark brown locally grey and light brown gravelly silty sand. Gravel of red brick, chalk, concrete, black carbonaceous material and chert.			1.0			PID = 0.00	
2.80				2.0				
	(Medium Dense) light brown to orangish brown gravelly fine to medium SAND. Gravel of sub-angular to rounded chert.			3.0				
3.35								
	(Dense) light brown to pale brown locally orange fine glauconitic SAND.			4.0				
4.00								
	Borehole Terminated			5.0				

Notes:

A: 250ml and 60ml Amber Glass Jars
T: Plastic Tub (1Kg)
SPT: Standard Penetration Test
HSV: Hand Shear Vane
PP: Pocket Penetrometer
PID: Photo-Ionisation Detector

Plant: Archway Dart

Water observations: No groundwater was encountered.

General remarks:
Densities are based upon field observations only.
Borehole terminated at 4.0mbgl due to refusal on very dense sand.

Logged by: CH	Checked by: ET	Approved by: RE

DYNAMIC SAMPLING RECORD

Project Title: Royal Arsenal Riverside - Phase 18-19	Borehole: WS08
Project No: 1508005.003	Dates: 05 March 2016
Client: Berkeley Homes (East Thames) Limited	

TWEEDIE EVANS CONSULTING
www.tecon.co.uk
info@tecon.co.uk

Depth (m)	Description	Legend	Sample Details	Depth (m)	SPT Results: Blow Count	SPT Results: N Value	Remarks/ Data	Installation
0.00	Ground Surface			0.0				
0.12	MADE GROUND Tarmacadam hardstanding.						PID (ppm) Results PID = 0.00	
	MADE GROUND Brown gravelly sandy clay. Gravel of reddish brown, concrete, black carbonaceous material and chert.		A					
0.80	MADE GROUND Cobble of concrete.			1.0			PID = 0.00	
	MADE GROUND Brown gravelly sandy clay. Gravel of chert, red brick and black carbonaceous material.							
1.95	Light brown to orangish brown gravelly SAND. Gravel of rounded to sub-angular chert.			2.0				
	Borehole Terminated			3.0				
				4.0				
				5.0				

Notes:

A: 250ml and 60ml Amber Glass Jars
T: Plastic Tub (1Kg)
SPT: Standard Penetration Test
HSV: Hand Shear Vane
PP: Pocket Penetrometer
PID: Photo-Ionisation Detector

Plant: Archway Dart

Water observations: No groundwater was encountered.

General remarks:

Borehole terminated at 2.0mbgl once natural ground was encountered.

Logged by: CH	Checked by: ET	Approved by: RE

DYNAMIC SAMPLING RECORD

Project Title: Royal Arsenal Riverside - Phase 18-19	Borehole: WS09
Project No: 1508005.003	Dates: 05 March 2016
Client: Berkeley Homes (East Thames) Limited	

TWEEDIE EVANS CONSULTING
www.tecon.co.uk
info@tecon.co.uk

Depth (m)	Description	Legend	Sample Details	Depth (m)	SPT Results: Blow Count	SPT Results: N Value	Remarks/ Data	Installation
0.00	Ground Surface			0.0				
0.11	MADE GROUND Tarmacadam hardstanding.						PID (ppm) Results PID = 0.00	
	MADE GROUND Dark brown locally grey and black slightly clayey gravelly silty sand. Gravel of red brick, concrete, charcoal, sandstone, black carbonaceous material and chert.		A				PID = 0.00	
1.50				1.0	(1, 0) 1, 0, 1, 0	2		
1.90	MADE GROUND Brown gravelly silty sand. Gravel of red brick and chert.							
	Medium dense light brown to orangish brown gravelly SAND. Gravel of rounded to sub-angular chert.			2.0	(4, 6) 6, 6, 8, 8	28		
2.70								
	Medium dense to very dense light brown to pale brown locally orangish fine glauconitic SAND.			3.0	(4, 4) 4, 5, 5, 6	20		
4.00								
	Borehole Terminated			4.0	(7, 9) 12, 16, 22	>50		
				5.0				

Notes:

- A: 250ml and 60ml Amber Glass Jars
- T: Plastic Tub (1Kg)
- SPT: Standard Penetration Test
- HSV: Hand Shear Vane
- PP: Pocket Penetrometer
- PID: Photo-Ionisation Detector

Plant: Archway Dart

Water observations: No groundwater was encountered.

General remarks:

Borehole terminated at 4.0mbgl due to effective refusal on very dense sand.

Logged by: CH	Checked by: ET	Approved by: RE

APPENDIX G

Geochemical Certificates of Analysis

Claire Hooley
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Analytical Report Number : 16-13640

Project / Site name:	Royal Arsenal Riverside - Phases 18-19	**Samples received on:**	07/03/2016
Your job number:	1508005-003-01	**Samples instructed on:**	17/03/2016
Your order number:		**Analysis completed by:**	01/04/2016
Report Issue Number:	1	**Report issued on:**	01/04/2016
Samples Analysed:	3 leachate samples - 8 soil samples		

Signed: [redacted]
[redacted]
Reporting Manager
For & on behalf of i2 Analytical Ltd.

Signed: [redacted]
[redacted]
Assistant Reporting Manager
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

Excel copies of reports are only valid when accompanied by this PDF certificate.

Analytical Report Number: 16-13640

Project / Site name: Royal Arsenal Riverside - Phases 18-19

Lab Sample Number				550931	550932	550933	550934	550935
Sample Reference				WS01	WS03	WS04	WS04	WS05
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.40-0.50	0.30-0.40	0.10-0.20	0.80-0.90	0.50-0.60
Date Sampled				02/03/2016	03/03/2016	03/03/2016	03/03/2016	03/03/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)								
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	3.6	6.5	5.5	5.6	2.0
Total mass of sample received	kg	0.001	NONE	0.54	0.51	0.46	0.52	0.52
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	Chrysotile, Amosite- Loose Fibres	Amosite- Loose Fibres	-	-
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Detected	Detected	Not-detected	Not-detected
General Inorganics								
pH	pH Units	N/A	MCERTS	8.4	9.1	10.1	5.9	8.6
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Total Sulphate as SO_4	mg/kg	50	MCERTS	580	2700	11000	4400	280
Water Soluble Sulphate (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.054	0.51	0.47	1.2	0.046
Sulphide	mg/kg	1	MCERTS	< 1.0	5.0	18	130	< 1.0
Total Organic Carbon (TOC)	%	0.1	MCERTS	< 0.1	0.5	1.1	0.3	0.2
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	0.19
Acenaphthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	0.40	< 0.10	< 0.10
Fluorene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	0.23	< 0.10	< 0.10
Phenanthrene	mg/kg	0.1	MCERTS	< 0.10	0.42	2.8	< 0.10	0.64
Anthracene	mg/kg	0.1	MCERTS	< 0.10	0.18	0.68	< 0.10	0.31
Fluoranthene	mg/kg	0.1	MCERTS	< 0.10	1.1	4.3	< 0.10	2.0
Pyrene	mg/kg	0.1	MCERTS	< 0.10	1.3	3.8	< 0.10	1.8
Benzo(a)anthracene	mg/kg	0.1	MCERTS	< 0.10	0.69	1.9	< 0.10	0.97
Chrysene	mg/kg	0.05	MCERTS	< 0.05	0.63	1.9	< 0.05	0.86
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	0.62	1.8	< 0.10	0.93
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	0.48	1.1	< 0.10	0.61
Benzo(a)pyrene	mg/kg	0.1	MCERTS	< 0.10	0.58	1.7	< 0.10	0.88
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	< 0.10	0.37	1.0	< 0.10	0.45
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	0.23	< 0.10	< 0.10
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	0.46	1.4	< 0.05	0.45
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	1.6	MCERTS	< 1.60	6.78	23.2	< 1.60	10.1
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	6.9	8.0	9.1	29	4.6
Barium (aqua regia extractable)	mg/kg	1	MCERTS	27	76	190	100	33
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.4	0.5	0.7	0.4	0.3
Boron (water soluble)	mg/kg	0.2	MCERTS	1.4	1.4	1.0	1.7	< 0.2
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	14	18	24	31	9.4
Copper (aqua regia extractable)	mg/kg	1	MCERTS	20	120	37	85	33
Lead (aqua regia extractable)	mg/kg	1	MCERTS	66	160	150	300	110
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	11	14	18	44	8.3
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	26	28	37	69	18
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	32	110	150	17	25

Analytical Report Number: 16-13640

Project / Site name: Royal Arsenal Riverside - Phases 18-19

Lab Sample Number				550931	550932	550933	550934	550935
Sample Reference				WS01	WS03	WS04	WS04	WS05
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.40-0.50	0.30-0.40	0.10-0.20	0.80-0.90	0.50-0.60
Date Sampled				02/03/2016	03/03/2016	03/03/2016	03/03/2016	03/03/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)								
Monoaromatics								
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Petroleum Hydrocarbons								
TPH C10 - C40	mg/kg	10	MCERTS	< 10	440	310	54	24
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	12	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	3.6	3.7	17	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	34	17	10	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0	210	97	8.5	< 8.0
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	250	120	48	< 10
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	1.6	2.3	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	6.1	3.0	< 2.0
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10	17	33	< 10	< 10
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	< 10	99	94	< 10	14
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	120	140	< 10	21
PCBs								
PCB Congener 077	mg/kg	0.001	NONE	-	< 0.001	-	-	-
PCB Congener 081	mg/kg	0.001	NONE	-	< 0.001	-	-	-
PCB Congener 105	mg/kg	0.001	NONE	-	< 0.001	-	-	-
PCB Congener 114	mg/kg	0.001	NONE	-	< 0.001	-	-	-
PCB Congener 118	mg/kg	0.001	NONE	-	< 0.001	-	-	-
PCB Congener 123	mg/kg	0.001	NONE	-	< 0.001	-	-	-
PCB Congener 126	mg/kg	0.001	NONE	-	< 0.001	-	-	-
PCB Congener 156	mg/kg	0.001	NONE	-	< 0.001	-	-	-
PCB Congener 157	mg/kg	0.001	NONE	-	< 0.001	-	-	-
PCB Congener 167	mg/kg	0.001	NONE	-	< 0.001	-	-	-
PCB Congener 169	mg/kg	0.001	NONE	-	< 0.001	-	-	-
PCB Congener 189	mg/kg	0.001	NONE	-	< 0.001	-	-	-
Total PCBs	mg/kg	0.012	NONE	-	< 0.012	-	-	-

Analytical Report Number: 16-13640

Project / Site name: Royal Arsenal Riverside - Phases 18-19

Lab Sample Number				550936	550937	550938		
Sample Reference				WS06	WS07	WS08		
Sample Number				None Supplied	None Supplied	None Supplied		
Depth (m)				0.80-1.00	0.50-0.60	0.40-0.50		
Date Sampled				04/03/2016	04/03/2016	04/03/2016		
Time Taken				None Supplied	None Supplied	None Supplied		
Analytical Parameter (Soil Analysis)								
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1		
Moisture Content	%	N/A	NONE	15	17	6.3		
Total mass of sample received	kg	0.001	NONE	0.48	0.49	0.46		
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	-	Chrysotile - Loose Fibres		
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Detected		
General Inorganics								
pH	pH Units	N/A	MCERTS	8.6	8.2	9.0		
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1		
Total Sulphate as SO_4	mg/kg	50	MCERTS	740	670	7200		
Water Soluble Sulphate (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.053	0.042	1.2		
Sulphide	mg/kg	1	MCERTS	< 1.0	1.1	13		
Total Organic Carbon (TOC)	%	0.1	MCERTS	< 0.1	0.9	0.8		
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Acenaphthylene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	0.19		
Acenaphthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	0.44		
Fluorene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	0.34		
Phenanthrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	3.8		
Anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	1.4		
Fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	7.9		
Pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	7.2		
Benzo(a)anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	3.4		
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	3.6		
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	3.0		
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	2.2		
Benzo(a)pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	3.0		
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	1.5		
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	0.27		
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	1.8		
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	1.6	MCERTS	< 1.60	< 1.60	40.0		
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	11	9.3	24		
Barium (aqua regia extractable)	mg/kg	1	MCERTS	74	220	140		
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	1.3	0.6	0.4		
Boron (water soluble)	mg/kg	0.2	MCERTS	0.5	0.8	1.5		
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2		
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2	< 1.2	< 1.2		
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	21	9.2	24		
Copper (aqua regia extractable)	mg/kg	1	MCERTS	40	120	53		
Lead (aqua regia extractable)	mg/kg	1	MCERTS	270	290	230		
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	0.6	< 0.3		
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	22	11	19		
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	49	34	28		
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	53	72	110		

Lab Sample Number				550936	550937	550938		
Sample Reference				WS06	WS07	WS08		
Sample Number				None Supplied	None Supplied	None Supplied		
Depth (m)				0.80-1.00	0.50-0.60	0.40-0.50		
Date Sampled				04/03/2016	04/03/2016	04/03/2016		
Time Taken				None Supplied	None Supplied	None Supplied		
Analytical Parameter (Soil Analysis)								
Monoaromatics								
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		

Petroleum Hydrocarbons

TPH C10 - C40	mg/kg	10	MCERTS	< 10	< 10	730		
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1		
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1		
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1		
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	1.5		
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	26		
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	< 8.0	45		
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0	< 8.0	310		
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10	380		
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1		
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1		
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1		
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	2.2		
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	10		
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10	< 10	45		
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	< 10	< 10	170		
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10	230		

PCBs

PCB Congener 077	mg/kg	0.001	NONE	< 0.001	-	< 0.001		
PCB Congener 081	mg/kg	0.001	NONE	< 0.001	-	< 0.001		
PCB Congener 105	mg/kg	0.001	NONE	< 0.001	-	< 0.001		
PCB Congener 114	mg/kg	0.001	NONE	< 0.001	-	< 0.001		
PCB Congener 118	mg/kg	0.001	NONE	< 0.001	-	< 0.001		
PCB Congener 123	mg/kg	0.001	NONE	< 0.001	-	< 0.001		
PCB Congener 126	mg/kg	0.001	NONE	< 0.001	-	< 0.001		
PCB Congener 156	mg/kg	0.001	NONE	< 0.001	-	< 0.001		
PCB Congener 157	mg/kg	0.001	NONE	< 0.001	-	< 0.001		
PCB Congener 167	mg/kg	0.001	NONE	< 0.001	-	< 0.001		
PCB Congener 169	mg/kg	0.001	NONE	< 0.001	-	< 0.001		
PCB Congener 189	mg/kg	0.001	NONE	< 0.001	-	< 0.001		
Total PCBs	mg/kg	0.012	NONE	< 0.012	-	< 0.012		

Analytical Report Number: 16-13640

Project / Site name: Royal Arsenal Riverside - Phases 18-19

Lab Sample Number				550939	550940	550941		
Sample Reference				WS04	WS06	WS08		
Sample Number				None Supplied	None Supplied	None Supplied		
Depth (m)				0.80-0.90	0.80-1.00	0.40-0.50		
Date Sampled				03/03/2016	04/03/2016	04/03/2016		
Time Taken				None Supplied	None Supplied	None Supplied		
Analytical Parameter (Leachate Analysis)								
General Inorganics								
pH	pH Units	N/A	ISO 17025	7.7	8.0	8.9		
Total Cyanide	µg/l	10	ISO 17025	< 10	< 10	< 10		
Sulphate as SO_4	µg/l	100	ISO 17025	39300	7890	62100		
Sulphide	µg/l	5	NONE	< 5.0	< 5.0	< 5.0		
Total Organic Carbon (TOC)	mg/l	0.1	NONE	2.23	2.68	7.78		
Total Phenols								
Total Phenols (monohydric)	µg/l	10	ISO 17025	< 10	< 10	< 10		
Speciated PAHs								
Naphthalene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01		
Acenaphthylene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01		
Acenaphthene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01		
Fluorene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01		
Phenanthrene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01		
Anthracene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01		
Fluoranthene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01		
Pyrene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01		
Benzo(a)anthracene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01		
Chrysene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01		
Benzo(b)fluoranthene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01		
Benzo(k)fluoranthene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01		
Benzo(a)pyrene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01		
Indeno(1,2,3-cd)pyrene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01		
Dibenz(a,h)anthracene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01		
Benzo(ghi)perylene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01		
Total PAH								
Total EPA-16 PAHs	µg/l	0.2	NONE	< 0.2	< 0.2	< 0.2		
Heavy Metals / Metalloids								
Arsenic (dissolved)	µg/l	1.1	ISO 17025	1.7	12	8.0		
Barium (dissolved)	µg/l	0.05	ISO 17025	170	16	46		
Beryllium (dissolved)	µg/l	0.2	ISO 17025	< 0.2	< 0.2	< 0.2		
Boron (dissolved)	µg/l	10	ISO 17025	48	< 10	11		
Cadmium (dissolved)	µg/l	0.08	ISO 17025	< 0.08	< 0.08	< 0.08		
Chromium (dissolved)	µg/l	0.4	ISO 17025	< 0.4	1.1	3.0		
Copper (dissolved)	µg/l	0.7	ISO 17025	3.4	3.3	28		
Lead (dissolved)	µg/l	1	ISO 17025	4.0	19	15		
Mercury (dissolved)	µg/l	0.5	ISO 17025	< 0.5	< 0.5	< 0.5		
Nickel (dissolved)	µg/l	0.3	ISO 17025	8.8	< 0.3	4.7		
Selenium (dissolved)	µg/l	4	ISO 17025	< 4.0	< 4.0	< 4.0		
Vanadium (dissolved)	µg/l	1.7	ISO 17025	< 1.7	17	34		
Zinc (dissolved)	µg/l	0.4	ISO 17025	< 0.4	< 0.4	< 0.4		

Analytical Report Number : 16-13640

Project / Site name: Royal Arsenal Riverside - Phases 18-19

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
550931	WS01	None Supplied	0.40-0.50	Light brown sandy loam with gravel.
550932	WS03	None Supplied	0.30-0.40	Brown loam and sand with gravel.
550933	WS04	None Supplied	0.10-0.20	Light brown sandy loam with gravel and rubble.
550934	WS04	None Supplied	0.80-0.90	Brown clay and sand.
550935	WS05	None Supplied	0.50-0.60	Light brown sandy loam with gravel.
550936	WS06	None Supplied	0.80-1.00	Light brown sandy loam with gravel and brick.
550937	WS07	None Supplied	0.50-0.60	Brown loam and clay with gravel.
550938	WS08	None Supplied	0.40-0.50	Brown loam and clay with gravel and rubble.

The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number : 16-13640

Project / Site name: Royal Arsenal Riverside - Phases 18-19

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron in leachate	Determination of boron by acidification followed by ICP-OES.	In-house method based on MEWAM	L039-PL	W	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Hexavalent chromium in soil (Lower Level)	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Metals by ICP-OES in leachate	Determination of metals in leachate by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Monohydric phenols in leachate	Determination of phenols in leachate by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	ISO 17025
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
PCBs WHO 12 in soil	Determination of PCBs (WHO-12 Congeners) by GC-MS.	In-house method based on USEPA 8082	L027-PL	D	NONE
pH in leachate	Determination of pH in leachate by electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L005-PL	W	ISO 17025
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	MCERTS
Speciated EPA-16 PAHs in leachate	Determination of PAH compounds in leachate by extraction in dichloromethane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L070-PL	W	NONE
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate in leachates	Determination of sulphate in leachate by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025

Analytical Report Number : 16-13640

Project / Site name: Royal Arsenal Riverside - Phases 18-19

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Sulphate, water soluble, in soil	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests, 2:1 water:soil extraction, analysis by ICP-OES.	L038-PL	D	MCERTS
Sulphide in leachate	Determination of sulphide in leachate by ion selective electrode.	In-house method	L010-PL	W	NONE
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode.	In-house method	L010-PL	D	MCERTS
Total cyanide in leachate	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	ISO 17025
Total organic carbon in leachate	Determination of dissolved organic carbon in leachate by TOC/DOC NDIR analyser.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037-PL	W	NONE
Total organic carbon in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L023-PL	D	MCERTS
Total sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L038-PL	D	MCERTS
TPH Banding in Soil by FID	Determination of hexane extractable hydrocarbons in soil by GC-FID.	In-house method, TPH with carbon banding.	L076-PL	W	MCERTS
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method	L076-PL	W	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

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Analytical Report Number : 16-17780

Project / Site name:	Royal Arsenal Riverside - Phase 18-19	**Samples received on:**	16/05/2016
Your job number:	1508005-003	**Samples instructed on:**	17/05/2016
Your order number:		**Analysis completed by:**	23/05/2016
Report Issue Number:	1	**Report issued on:**	23/05/2016
Samples Analysed:	1 water sample		

Signed: [redacted]

[redacted]
Reporting Manager
For & on behalf of i2 Analytical Ltd.

Signed: [redacted]

[redacted]
Assistant Reporting Manager
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

Excel copies of reports are only valid when accompanied by this PDF certificate.

Analytical Report Number: 16-17780

Project / Site name: Royal Arsenal Riverside - Phase 18-19

Lab Sample Number				574563				
Sample Reference				BH01a				
Sample Number				None Supplied				
Depth (m)				None Supplied				
Date Sampled				16/05/2016				
Time Taken				None Supplied				
Analytical Parameter (Water Analysis)								
General Inorganics								
pH	pH Units	N/A	ISO 17025	7.2				
Total Cyanide	µg/l	10	ISO 17025	< 10				
Sulphate as SO_4	µg/l	45	ISO 17025	444000				
Sulphide	µg/l	5	NONE	< 5.0				
Total Organic Carbon (TOC)	mg/l	0.1	ISO 17025	6.95				
Total Phenols								
Total Phenols (monohydric)	µg/l	10	ISO 17025	< 10				
Speciated PAHs								
Naphthalene	µg/l	0.01	ISO 17025	< 0.01				
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01				
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01				
Fluorene	µg/l	0.01	ISO 17025	< 0.01				
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01				
Anthracene	µg/l	0.01	ISO 17025	< 0.01				
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01				
Pyrene	µg/l	0.01	ISO 17025	< 0.01				
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01				
Chrysene	µg/l	0.01	ISO 17025	< 0.01				
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01				
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01				
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01				
Indeno(1,2,3-cd)pyrene	µg/l	0.01	NONE	< 0.01				
Dibenz(a,h)anthracene	µg/l	0.01	NONE	< 0.01				
Benzo(ghi)perylene	µg/l	0.01	NONE	< 0.01				
Total PAH								
Total EPA-16 PAHs	µg/l	0.16	NONE	< 0.16				
Heavy Metals / Metalloids								
Arsenic (dissolved)	µg/l	0.15	ISO 17025	9.97				
Barium (dissolved)	µg/l	0.06	ISO 17025	43				
Beryllium (dissolved)	µg/l	0.1	ISO 17025	0.1				
Boron (dissolved)	µg/l	10	ISO 17025	160				
Cadmium (dissolved)	µg/l	0.02	ISO 17025	< 0.02				
Chromium (hexavalent)	µg/l	5	ISO 17025	< 5.0				
Chromium (dissolved)	µg/l	0.2	ISO 17025	< 0.2				
Copper (dissolved)	µg/l	0.5	ISO 17025	< 0.5				
Lead (dissolved)	µg/l	0.2	ISO 17025	0.2				
Mercury (dissolved)	µg/l	0.05	ISO 17025	0.17				
Nickel (dissolved)	µg/l	0.5	ISO 17025	9.9				
Selenium (dissolved)	µg/l	0.6	ISO 17025	0.9				
Vanadium (dissolved)	µg/l	0.2	ISO 17025	0.2				
Zinc (dissolved)	µg/l	0.5	ISO 17025	2.2				

Analytical Report Number: 16-17780

Project / Site name: Royal Arsenal Riverside - Phase 18-19

Lab Sample Number				574563				
Sample Reference				BH01a				
Sample Number				None Supplied				
Depth (m)				None Supplied				
Date Sampled				16/05/2016				
Time Taken				None Supplied				
Analytical Parameter (Water Analysis)								
Monoaromatics								
Benzene	µg/l	1	ISO 17025	< 1.0				
Toluene	µg/l	1	ISO 17025	< 1.0				
Ethylbenzene	µg/l	1	ISO 17025	< 1.0				
p & m-xylene	µg/l	1	ISO 17025	< 1.0				
o-xylene	µg/l	1	ISO 17025	< 1.0				
MTBE (Methyl Tertiary Butyl Ether)	µg/l	1	ISO 17025	< 1.0				
Petroleum Hydrocarbons								
TPH1 (C10 - C40)	µg/l	10	NONE	< 10				
TPH-CWG - Aliphatic >C5 - C6	µg/l	10	NONE	< 10				
TPH-CWG - Aliphatic >C6 - C8	µg/l	10	NONE	< 10				
TPH-CWG - Aliphatic >C8 - C10	µg/l	10	NONE	< 10				
TPH-CWG - Aliphatic >C10 - C12	µg/l	10	NONE	< 10				
TPH-CWG - Aliphatic >C12 - C16	µg/l	10	NONE	< 10				
TPH-CWG - Aliphatic >C16 - C21	µg/l	10	NONE	< 10				
TPH-CWG - Aliphatic >C21 - C35	µg/l	10	NONE	< 10				
TPH-CWG - Aliphatic (C5 - C35)	µg/l	10	NONE	< 10				
TPH-CWG - Aromatic >C5 - C7	µg/l	10	NONE	< 10				
TPH-CWG - Aromatic >C7 - C8	µg/l	10	NONE	< 10				
TPH-CWG - Aromatic >C8 - C10	µg/l	10	NONE	< 10				
TPH-CWG - Aromatic >C10 - C12	µg/l	10	NONE	< 10				
TPH-CWG - Aromatic >C12 - C16	µg/l	10	NONE	< 10				
TPH-CWG - Aromatic >C16 - C21	µg/l	10	NONE	< 10				
TPH-CWG - Aromatic >C21 - C35	µg/l	10	NONE	< 10				
TPH-CWG - Aromatic (C5 - C35)	µg/l	10	NONE	< 10				

U/S = Unsuitable Sample I/S = Insufficient Sample

Analytical Report Number : 16-17780

Project / Site name: Royal Arsenal Riverside - Phase 18-19

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Boron in water	Determination of boron in water by acidification followed by ICP-OES. Accredited matrices: SW PW GW	In-house method based on MEWAM	L039-PL	W	ISO 17025
BTEX and MTBE in water (Monoaromatics)	Determination of BTEX and MTBE in water by headspace GC-MS. Accredited matrices: SW PW GW	In-house method based on USEPA8260	L073B-PL	W	ISO 17025
Hexavalent chromium in water	Determination of hexavalent chromium in water by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method by continuous flow analyser. Accredited Matrices SW, GW, PW.	L080-PL	W	ISO 17025
Metals in water by ICP-MS (dissolved)	Determination of metals in water by acidification followed by ICP-MS. Accredited Matrices: SW, GW, PW except B=SW,GW, Hg=SW,PW, Al=SW,PW.	In-house method based on USEPA Method 6020 & 200.8 "for the determination of trace elements in water by ICP-MS.	L012-PL	W	ISO 17025
Monohydric phenols in water	Determination of phenols in water by continuous flow analyser. Accredited matrices: SW PW GW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	ISO 17025
pH in water	Determination of pH in water by electrometric measurement. Accredited matrices: SW PW GW	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L005-PL	W	ISO 17025
Speciated EPA-16 PAHs in water	Determination of PAH compounds in water by extraction in dichloromethane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L0102B-PL	W	NONE
Sulphate in water	Determination of sulphate in water by acidification followed by ICP-OES. Accredited matrices: SW PW GW	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Sulphide in water	Determination of sulphide in water by ion selective electrode.	In-house method	L010-PL	W	NONE
Total cyanide in water	Determination of total cyanide by distillation followed by colorimetry. Accredited matrices: SW PW GW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	ISO 17025
Total organic carbon in water	Determination of dissolved organic carbon inlwater by TOC/DOC NDIR analyser.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037-PL	W	ISO 17025
TPH1 (Waters)	Determination of dichloromethane extractable hydrocarbons in water by GC-MS.	In-house method	L070-PL	W	NONE
TPHCWG (Waters)	Determination of dichloromethane extractable hydrocarbons in water by GC-MS, speciation by interpretation.	In-house method	L070-PL	W	NONE

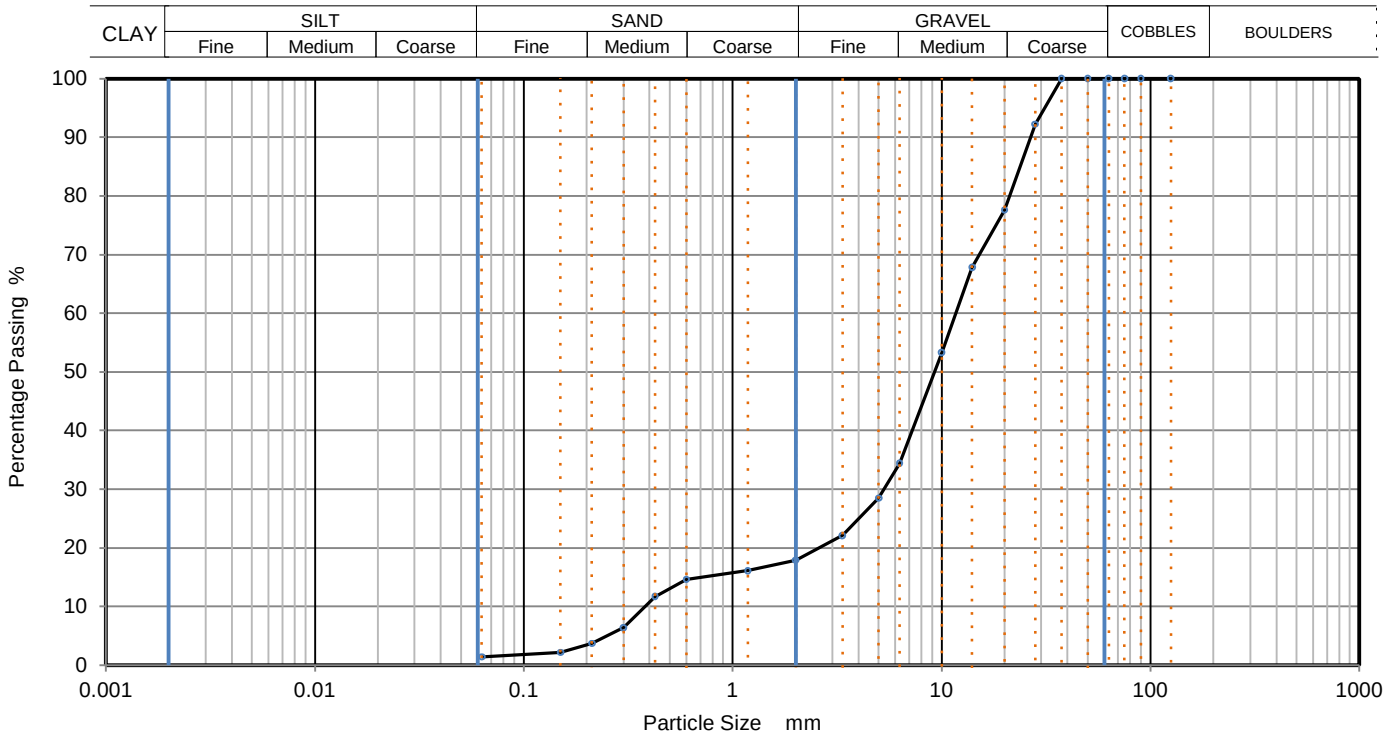
For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

APPENDIX H

Soil Geotechnical Certificates of Analysis

PARTICLE SIZE DISTRIBUTION

				Job Ref	20591
				Borehole/Pit No.	BH01a
Site Name	Royal Arsenal Riverside Phase 18-19			Sample No.	
Project No.	1508005.003	Client	TEC	Depth	2.20 m
Soil Description	Brown sandy GRAVEL (gravel is fmc and sub-rounded to sub-angular)			Sample Type	B
				Samples received	17/03/2016
				Schedules received	17/03/2016
Test Method	BS1377:Part 2: 1990, clause 9.0			Project started	18/03/2016
				Date tested	07/04/2016



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	92		
20	78		
14	68		
10	53		
6.3	34		
5	29		
3.35	22		
2	18		
1.18	16		
0.6	15		
0.425	12		
0.3	6		
0.212	4		
0.15	2		
0.063	1		

Dry Mass of sample, g	2617

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	82.1
Sand	16.5
Fines <0.063mm	1.4

Grading Analysis		
D100	mm	
D60	mm	11.7
D30	mm	5.31
D10	mm	0.38
Uniformity Coefficient		31
Curvature Coefficient		6.3

Remarks

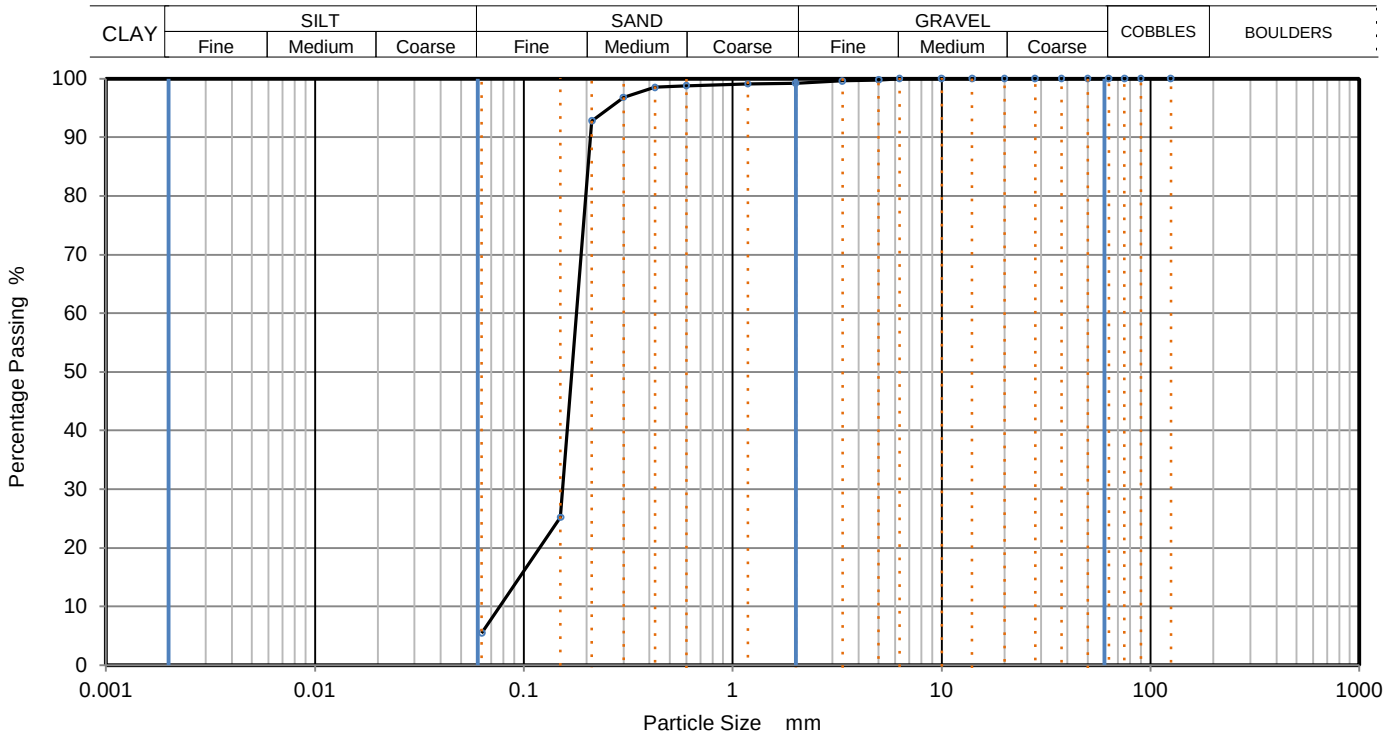
Preparation and testing in accordance with BS1377 unless noted below

K4 Soils Laboratory
Unit 8, Olds Close, Watford, Herts, WD18 9RU
Email: james@k4soils.com
Tel: 01923 711288

Checked and Approved
Initials: kp
Date: 08/04/2016

PARTICLE SIZE DISTRIBUTION

				Job Ref	20591
				Borehole/Pit No.	BH01a
Site Name	Royal Arsenal Riverside Phase 18-19			Sample No.	
Project No.	1508005.003	Client	TEC	Depth	3.50 m
Soil Description	Pale brown silty SAND with rare fine gravel			Sample Type	B
				Samples received	17/03/2016
				Schedules received	17/03/2016
Test Method	BS1377:Part 2: 1990, clause 9.0			Project started	18/03/2016
				Date tested	07/04/2016



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	99		
1.18	99		
0.6	99		
0.425	99		
0.3	97		
0.212	93		
0.15	25		
0.063	6		

Dry Mass of sample, g	600

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	0.8
Sand	93.7
Fines <0.063mm	5.5

Grading Analysis		
D100	mm	
D60	mm	0.179
D30	mm	0.154
D10	mm	0.0768
Uniformity Coefficient		2.3
Curvature Coefficient		1.7

Remarks

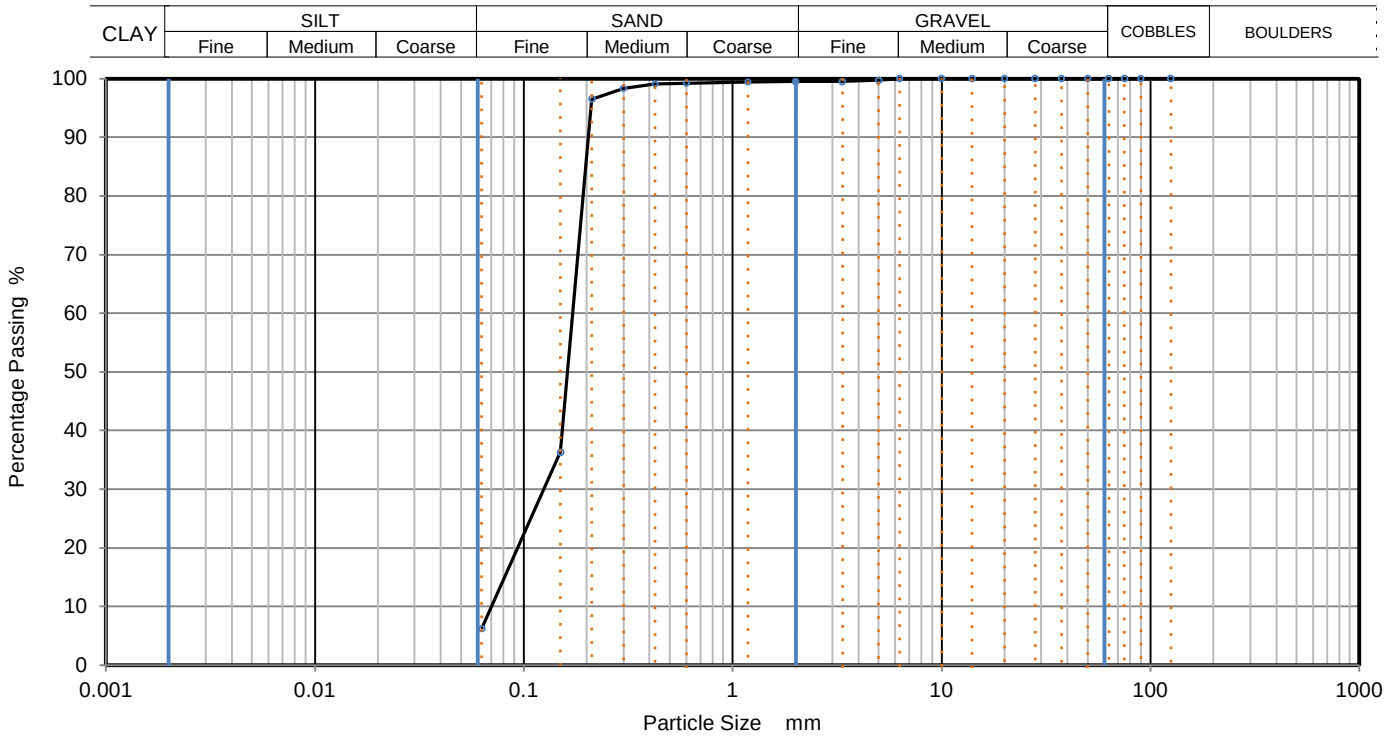
Preparation and testing in accordance with BS1377 unless noted below

K4 Soils Laboratory
Unit 8, Olds Close, Watford, Herts, WD18 9RU
Email: james@k4soils.com
Tel: 01923 711288

Checked and Approved
Initials: kp
Date: 08/04/2016

PARTICLE SIZE DISTRIBUTION

				Job Ref	20591
				Borehole/Pit No.	BH01a
Site Name	Royal Arsenal Riverside Phase 18-19			Sample No.	
Project No.	1508005.003	Client	TEC	Depth	8.00 m
Soil Description	Brown silty SAND			Sample Type	B
				Samples received	17/03/2016
				Schedules received	17/03/2016
Test Method	BS1377:Part 2: 1990, clause 9.0			Project started	18/03/2016
				Date tested	07/04/2016



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	99		
0.6	99		
0.425	99		
0.3	98		
0.212	97		
0.15	36		
0.063	6		

Dry Mass of sample, g	481

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	0.5
Sand	93.3
Fines <0.063mm	6.2

Grading Analysis		
D100	mm	
D60	mm	0.172
D30	mm	0.125
D10	mm	0.0703
Uniformity Coefficient		2.4
Curvature Coefficient		1.3

Remarks

Preparation and testing in accordance with BS1377 unless noted below

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Checked and Approved
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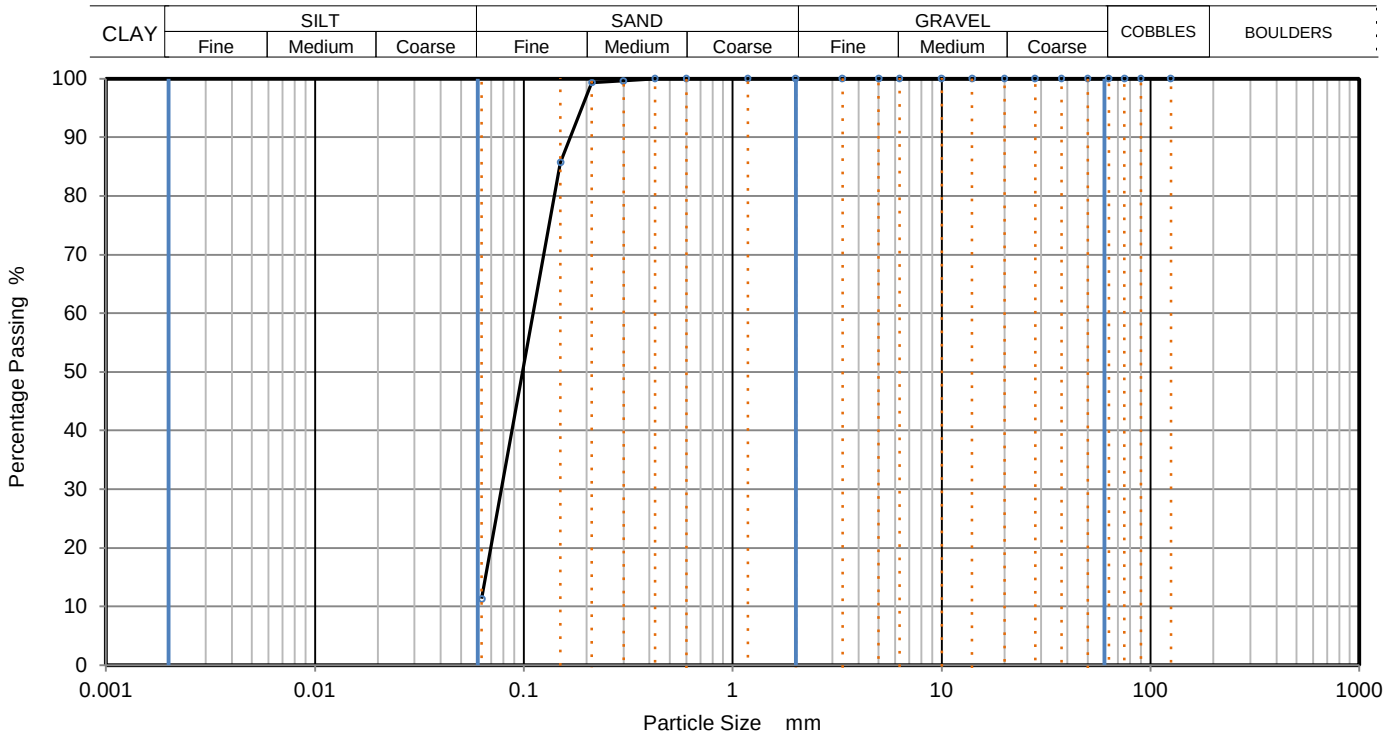
Date: 08/04/2016

PARTICLE SIZE DISTRIBUTION

				Job Ref	20591
				Borehole/Pit No.	BH01a
Site Name	Royal Arsenal Riverside Phase 18-19			Sample No.	
Project No.	1508005.003	Client	TEC	Depth	12.50 m
Soil Description	Brown silty SAND			Sample Type	B
				Samples received	17/03/2016
				Schedules received	17/03/2016
Test Method	BS1377:Part 2: 1990, clause 9.0			Project started	18/03/2016
				Date tested	05/04/2016



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	100		
0.425	100		
0.3	100		
0.212	99		
0.15	86		
0.063	11		

Dry Mass of sample, g	480

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	0.0
Sand	88.7
Fines <0.063mm	11.3

Grading Analysis		
D100	mm	
D60	mm	0.111
D30	mm	0.0783
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

Remarks

Preparation and testing in accordance with BS1377 unless noted below

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Checked and Approved
Initials: kp
Date: 08/04/2016

UKAS TESTING 2519

Approved Signatories: K.Phaure (Tech.Mgr) J.Phaure (Lab.Mgr)

Determination of shear strength using the Small Shearbox Apparatus

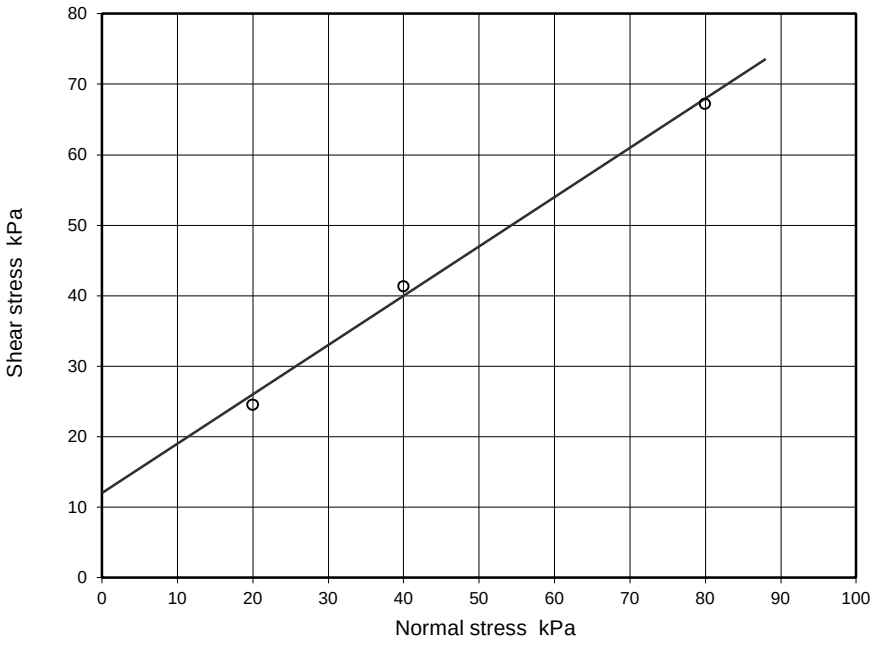
				Job Ref	20591
				Borehole/Pit No.	BH01a
Site Name	Royal Arsenal Riverside Phase 18-19			Sample No.	
Soil Description	Brown sandy GRAVEL (gravel is fmc and sub-rounded to sub-angular)			Depth m	2.20
				Sample Type	B
Project No.	1508005.003	Client	TEC	Sample received	17/03/2016
				Schedule received	17/03/2016
Test Method	BS1377 : Part 7 : 1990, clause 4			Date test started	18/03/2016
Preparation Details				Date completed	07/04/2016

Specimen Details

		Test No.						
Initial	Height	20.0	20.0	20.0				mm
	Bulk Density	1.91	1.91	1.91				Mg/m³
	Moisture Content	13.2	13.2	13.2				%
	Dry density	1.69	1.69	1.69				Mg/m³
	Voids ratio	0.580	0.598	0.598				
	Degree of Saturation	61	60	60				%
Consolidation	Consolidation / Normal Stress applied	**20**	**40**	**80**				kPa
	Change in height during consolidation*	-0.088	-0.100	-0.120				mm
	Voids ratio after consolidation	0.573	0.590	0.588				
After test	Final Moisture content	10.9	10.9	10.9				

Shearing stage(s)

Rate of displacement	Peak	1.14000	1.14000	1.14000				mm/min
	Residual							mm/min
Peak values, (o)	Relative horizontal displacement	1.50	1.75	3.00				mm
	Shear stress	24.5	41.3	67.2				kPa
	Vertical Movement at peak shear stress*	0.09	0.14	-0.06				mm
Residual values, (x)	No. of traverses (including peak run)	1	1	1				
	Relative horizontal displacement							mm
	Shear stress							kPa
	Vertical movement at residual shear stress*							mm



Shear Strength Parameters

Peak strength, (o)		Regression	Manual
c '	kPa	12	-
Ø '	degrees	35	-

Residual strength, (x)			
c 'R	kPa	[0.0]	-
Ø 'R	degrees	[ ]	-

Remarks :

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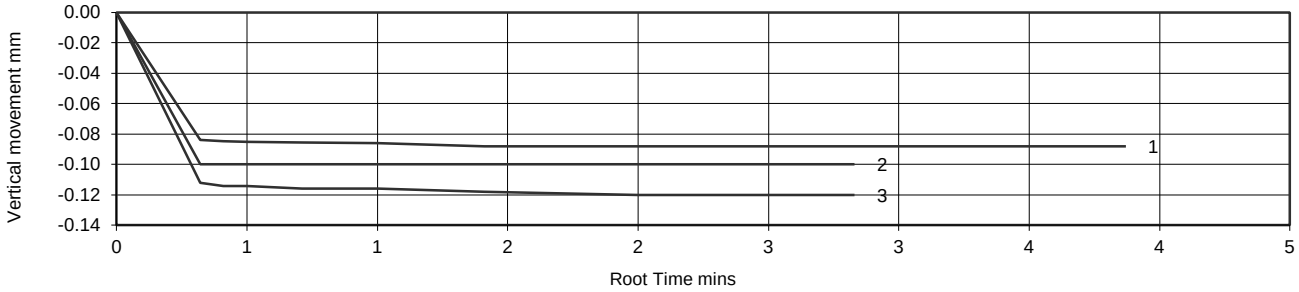
Date 08/04/2016

2519 *Approved Signatories: K.Phaure (Tech.Mgr) J.Phaure (Lab.Mgr)*

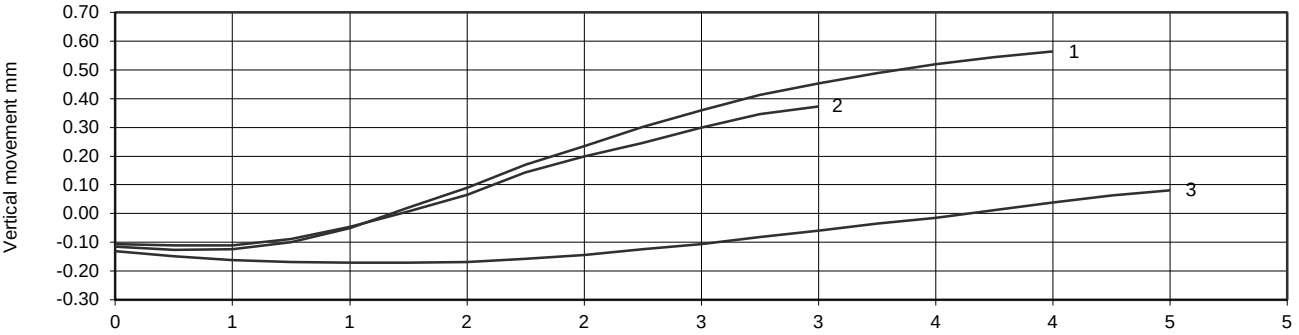
Determination of shear strength using the Small Shearbox Apparatus

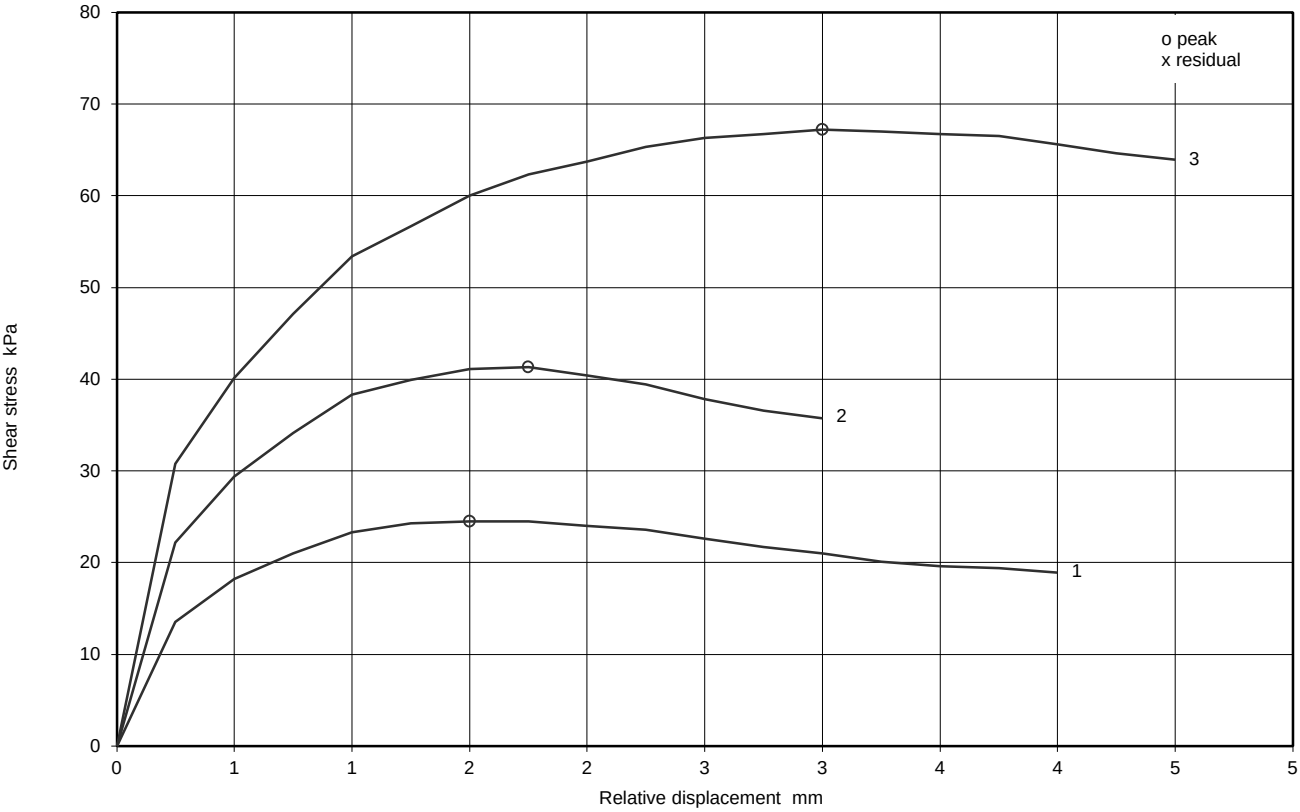
				Job Ref	20591
				Borehole/Pit No.	BH01a
Site Name	Royal Arsenal Riverside Phase 18-19			Sample No.	-
Soil Description	Brown sandy GRAVEL (gravel is fmc and sub-rounded to sub-angular)			Depth m	2.20
				Sample Type	B
Project No.	1508005.003	Client	TEC	Date of Test	07/04/2016

Consolidation stage(s)



Shearing stage(s)





*Note : Vertical movement/change in height is recorded as negative for reduced height (settlement) and positive for increased height (swell).

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Sheet 2 of 2

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Date 08/04/2016

Determination of shear strength using the Small Shearbox Apparatus

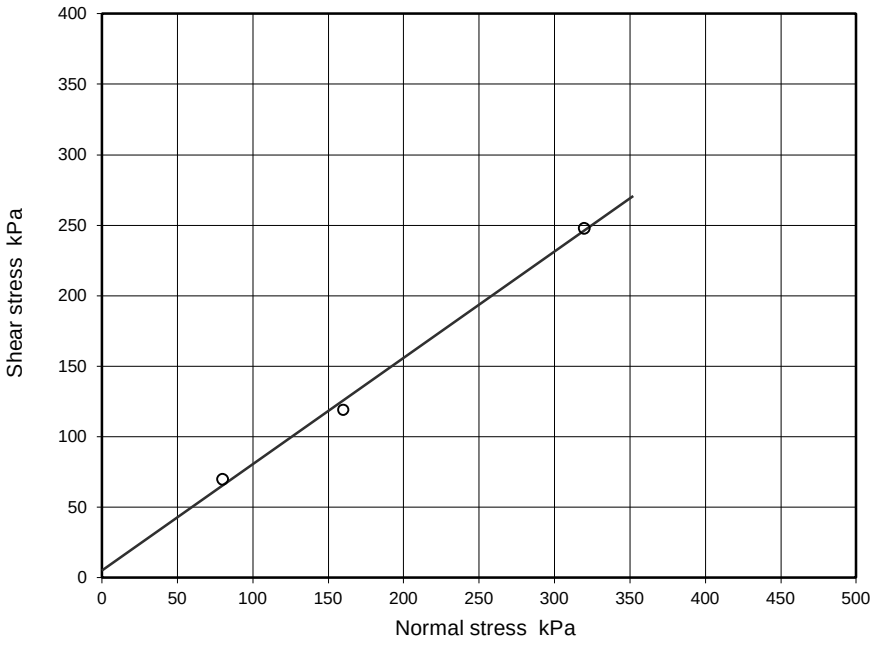
				Job Ref	20591
				Borehole/Pit No.	BH01a
Site Name	Royal Arsenal Riverside Phase 18-19			Sample No.	
Soil Description	Brown silty SAND			Depth m	8.00
				Sample Type	B
Project No.	1508005.003	Client	TEC	Sample received	17/03/2016
				Schedule received	17/03/2016
Test Method	BS1377 : Part 7 : 1990, clause 4			Date test started	08/03/2016
Preparation Details				Date completed	07/04/2016

Specimen Details

		Test No.						
Initial	Height	20.0	20.0	20.0				mm
	Bulk Density	1.81	1.81	1.81				Mg/m³
	Moisture Content	24.8	24.8	24.8				%
	Dry density	1.45	1.45	1.45				Mg/m³
	Voids ratio	0.862	0.862	0.862				
	Degree of Saturation	78	78	78				%
Consolidation	Consolidation / Normal Stress applied	**80**	**160**	**320**				kPa
	Change in height during consolidation*	-0.278	-0.300	-0.328				mm
	Voids ratio after consolidation	0.836	0.834	0.831				
After test	Final Moisture content	21.8	21.8	21.8				

Shearing stage(s)

Rate of displacement	Peak	1.14000	1.14000	1.14000				mm/min
	Residual							mm/min
Peak values, (o)	Relative horizontal displacement	2.50	3.25	3.25				mm
	Shear stress	69.6	119.0	247.7				kPa
	Vertical Movement at peak shear stress*	-0.14	-0.39	-0.27				mm
Residual values, (x)	No. of traverses (including peak run)	1	1	1				
	Relative horizontal displacement							mm
	Shear stress							kPa
	Vertical movement at residual shear stress*							mm



Shear Strength Parameters

Peak strength, (o)		Regression	Manual
c '	kPa	5.3	-
Ø '	degrees	37	-

Residual strength, (x)			
c 'R	kPa	[0.0]	-
Ø 'R	degrees	[ ]	-

Remarks :

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Sheet 1 of 2

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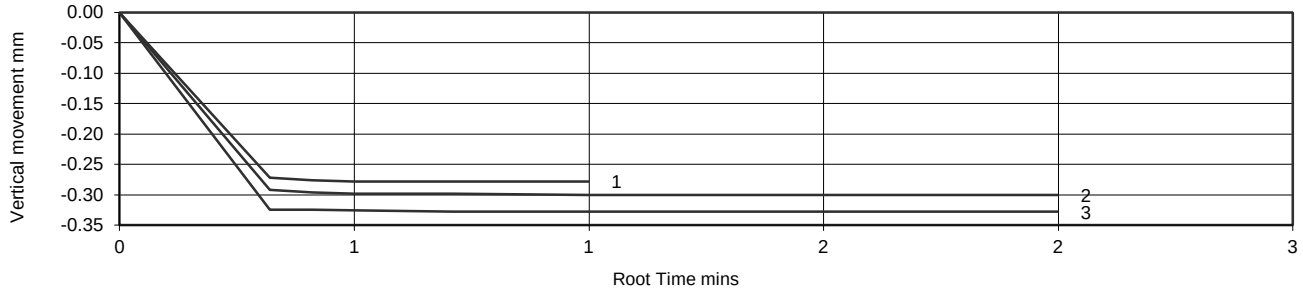
Date 08/04/2016

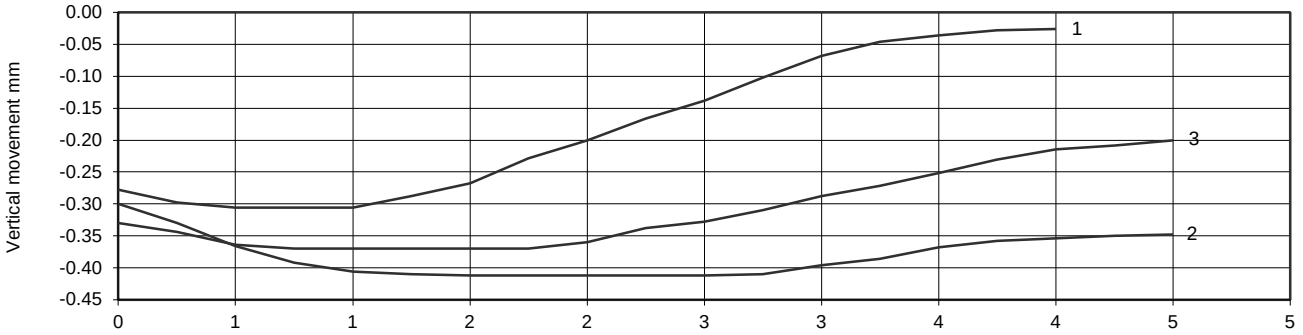
2519 *Approved Signatories: K.Phaure (Tech.Mgr) J.Phaure (Lab.Mgr)*

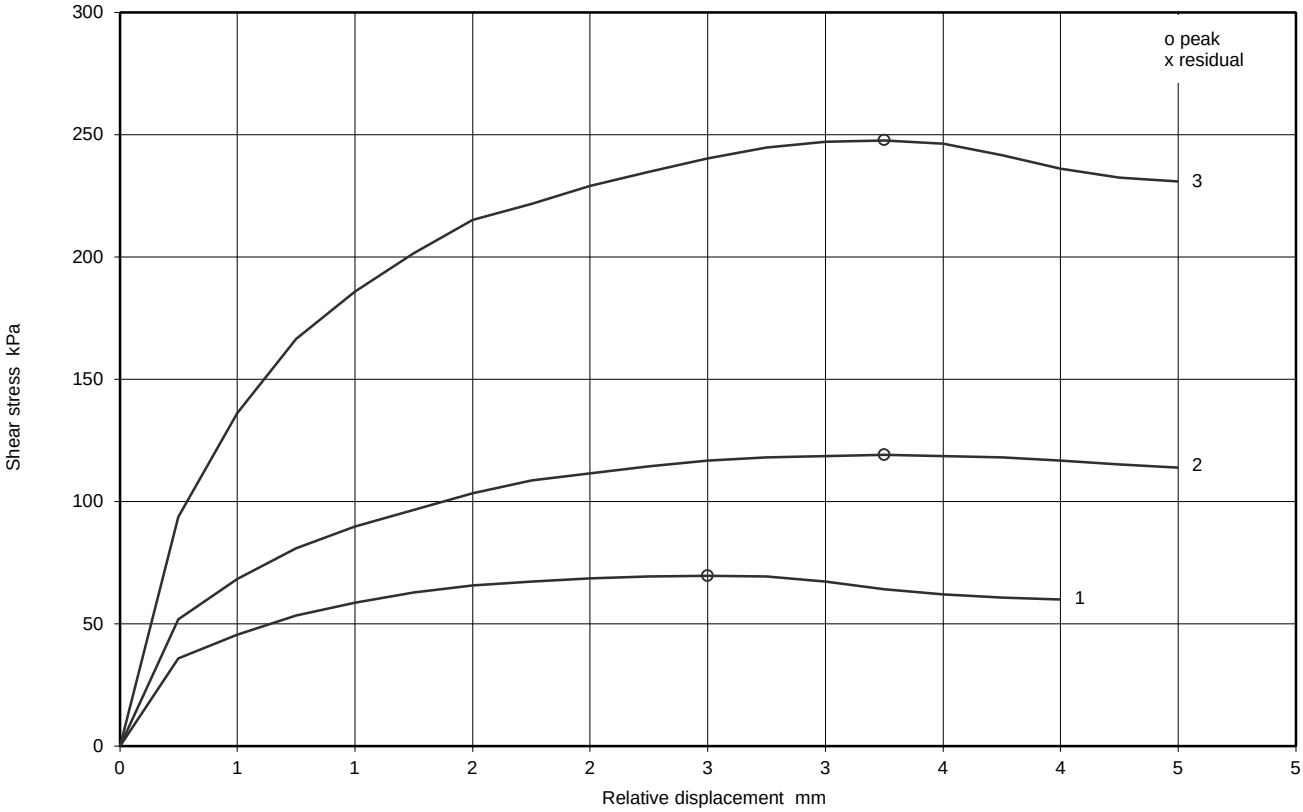
	Determination of shear strength using the Small Shearbox Apparatus			Job Ref	20591
				Borehole/Pit No.	BH01a
Site Name	Royal Arsenal Riverside Phase 18-19			Sample No.	-
Soil Description	Brown silty SAND			Depth m	8.00
				Sample Type	B
Project No.	1508005.003	Client	TEC	Date of Test	07/04/2016

Consolidation stage(s)



Shearing stage(s)





*Note : Vertical movement/change in height is recorded as negative for reduced height (settlement) and positive for increased height (swell).

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Sheet 2 of 2

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Date 08/04/2016

2519 Approved Signatories: K.Phaure (Tech.Mgr) J.Phaure (Lab.Mgr)

Sulphate Content (Gravimetric Method) for 2:1 Soil: Water Extract and pH Value - Summary of Results

Tested in accordance with BS1377 : Part 3 : 1990, clause 5.3 and clause 9

Job No.	Project Name	Programme	
20591	Royal Arsenal Riverside Phase 18-19	Samples received	17/03/2016
		Schedule received	17/03/2016
Project No.	Client	Project started	18/03/2016
1508005.003	TEC	Testing Started	04/04/2016

Hole No.	Sample				Soil description	Dry Mass passing 2mm	SO3 Content	SO4 Content	pH	Remarks
	Ref	Top	Base	Type		%	g/l	g/l		
BH01a		2.20		B	Brown sandy GRAVEL (gravel is fmc and sub-rounded to sub-angular)	18	0.17	0.21	7.38	
BH01a		3.50		B	Pale brown silty SAND with rare fine gravel	99	0.24	0.29	7.38	
BH01a		12.50		B	Brown silty SAND	100	0.19	0.23	7.42	
BH01a		16.20		D	Fmc sub-angular to rounded GRAVEL in a off white chalk and dark grey clay matrix	20	0.37	0.44	7.22	
BH01a		20.00		D	Fmc sub-angular to rounded GRAVEL in a off white chalk and dark grey clay matrix	20	0.48	0.57	7.28	

Test Report by K4 SOILS LABORATORY
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Checked and Approved

Initials **kp**

Date: **08/04/2016**

2519

Approved Signatories: K.Phaure (Tech.Mgr) J.Phaure (Lab.Mgr)

APPENDIX I

Ground Gas Monitoring Results

Ground Gas Monitoring Data Sheet

Name of Site:	Royal Arsenal Riverside - Phases 18 - 19				
Project Code:	1508005.003				
Date: 31/03/2016	Equipment		Last Three Days		
Completed by: CH	Gas Analyser:	GFM 430	Atmospheric Trend:		
Authorised by: ET	Condition:	Good	Temperature Range:		
	Dipmeter:	Dual Phase	Rainfall:		
	Condition:	Good			

On-site Weather Conditions: Cloudy, dry

General Site Conditions / Ground Conditions / On site Activities:

Sub-contractors presetn onsite

GAS MONITORING TO BE UNDERTAKEN IN ACCORDANCE WITH TEC METHOD STATEMENT

Borehole Information	Time (seconds)	Borehole Flow Rate (l/hr)	DP (Pa)	Gas Concentrations						Groundwater Level	Borehole Depth	Comments
				CH4 (%v/v)	CO2 (%v/v)	O2 (%v/v)	H2S (ppm)	CO (ppm)	LEL (%)			
BH ref: BH01a	0	0.0	0	0.0	0.0	21.4	0	0	0			
Time: 09.30	15	0.8	2	0.0	2.3	19.3	0	0	0			
Atmospheric Pressure (mb)	30	0.9	2	0.0	2.4	19.0	0	0	0			
Before: 994	45	0.8	2	0.0	2.4	18.9	0	0	0			
After: 995	60	1.0	3	0.0	2.4	18.9	0	0	0			
Well Condition: Good	120	1.2	3	0.0	2.4	18.9	0	0	0			
	180	1.2	3	0.0	2.4	18.9	0	0	0			
Well Diameter: 50mm										10.29	12.23	

Borehole Information	Time (seconds)	Borehole Flow Rate (l/hr)	DP (Pa)	Gas Concentrations						Groundwater Level	Borehole Depth	Comments
				CH4 (%v/v)	CO2 (%v/v)	O2 (%v/v)	H2S (ppm)	CO (ppm)	LEL (%)			
BH ref: WS05	0	0.0	0	0.0	0	20.7	0	0	0			
Time: 10.00	15	0.0	0	0.0	2.4	18.7	0	0	0			
Atmospheric Pressure (mb)	30	0.0	0	0.0	2.5	18.4	0	0	0			
Before: 994	45	0.0	0	0.0	2.5	18.4	0	0	0			
After: 994	60	0.0	0	0.0	2.5	18.3	0	0	0			
Well Condition: Good	120			0.0	2.5	18.3	0	0	0			
	180			0.0	2.5	18.3	0	0	0			
Well Diameter: 50mm												
										DRY	2.09	

Ground Gas Monitoring Data Sheet

Name of Site:	Royal Arsenal Riverside - Phases 18 - 19				
Project Code:	1508005.003				
Date: 31/03/2016	Equipment		Last Three Days		
Completed by: CH	Gas Analyser:	GFM 430	Atmospheric Trend:		
Authorised by: ET	Condition:	Good	Temperature Range:		
	Dipmeter:	Dual Phase	Rainfall:		
	Condition:	Good			

On-site Weather Conditions: Cloudy, dry

General Site Conditions / Ground Conditions / On site Activities:

Sub-contractors presetn onsite

GAS MONITORING TO BE UNDERTAKEN IN ACCORDANCE WITH TEC METHOD STATEMENT

Borehole Information	Time (seconds)	Borehole Flow Rate (l/hr)	DP (Pa)	Gas Concentrations						Groundwater Level	Borehole Depth	Comments
				CH4 (%v/v)	CO2 (%v/v)	O2 (%v/v)	H2S (ppm)	CO (ppm)	LEL (%)			
BH ref: WS03	0	0.2	0	0.0	0.0	20.9	0	0	0			
Time: 10.15	15	0.0	0	0.0	4.1	15.9	0	0	0			
Atmospheric Pressure (mb)	30	0.0	0	0.0	4.1	15.5	0	0	0			
Before: 995	45	0.0	0	0.0	4.1	15.5	0	0	0			
After: 995	60	0.0	0	0.0	4.1	15.4	0	0	0			
Well Condition: Good	120			0.0	4.2	15.4	0	0	0			
	180			0.0	4.2	15.4	0	0	0			
Well Diameter: 50mm										Dry	3.07	

Borehole Information	Time (seconds)	Borehole Flow Rate (l/hr)	DP (Pa)	Gas Concentrations						Groundwater Level	Borehole Depth	Comments
				CH4 (%v/v)	CO2 (%v/v)	O2 (%v/v)	H2S (ppm)	CO (ppm)	LEL (%)			
BH ref: WS06	0	0.1	0	0.0	0.0	20.1	0	0	0			
Time: 10.40	15	0.0	0	0.0	0.6	20	0	0	0			
Atmospheric Pressure (mb)	30	0.0	0	0.0	0.4	19.9	0	0	0			
Before: 995	45	0.0	0	0.0	0.5	19.9	0	0	0			
After: 994	60	0.0	0	0.0	0.4	19.9	0	0	0			
Well Condition: Good	120			0.0	0.4	19.9	0	0	0			
	180			0.0	0.3	19.9	0	0	0			
Well Diameter: 50mm												
										DRY	3.12	

Ground Gas Monitoring Data Sheet

Name of Site:	Royal Arsenal Riverside - Phases 18 - 19				
Project Code:	1508005.003				
Date: 15/04/2016	Equipment		Last Three Days		
Completed by: CH	Gas Analyser:	GFM 430	Atmospheric Trend:		
Authorised by: ET	Condition:	Good	Temperature Range:		
	Dipmeter:	Dual Phase	Rainfall:		
	Condition:	Good			

On-site Weather Conditions: Cloudy, dry

General Site Conditions / Ground Conditions / On site Activities:

Sub-contractors presetn onsite

GAS MONITORING TO BE UNDERTAKEN IN ACCORDANCE WITH TEC METHOD STATEMENT

Borehole Information	Time (seconds)	Borehole Flow Rate (l/hr)	DP (Pa)	Gas Concentrations						Groundwater Level	Borehole Depth	Comments
				CH4 (%v/v)	CO2 (%v/v)	O2 (%v/v)	H2S (ppm)	CO (ppm)	LEL (%)			
BH ref: BH01a	0	0.0	0	0.0	1.2	20.4	0	0	0			
Time: 09.30	15	0.0	0	0.0	1.5	19.3	0	0	0			
Atmospheric Pressure (mb)	30	0.0	0	0.0	1.5	19.3	0	0	0			
Before: 1027	45	0.0	0	0.0	1.5	19.2	0	0	0			
After: 1027	60	0.0	0	0.0	1.6	19.2	0	0	0			
Well Condition: Good	120			0.0	1.6	19.2	0	0	0			
	180			0.0	1.6	19.2	0	0	0			
Well Diameter: 50mm										10.32	12.04	

Borehole Information	Time (seconds)	Borehole Flow Rate (l/hr)	DP (Pa)	Gas Concentrations						Groundwater Level	Borehole Depth	Comments
				CH4 (%v/v)	CO2 (%v/v)	O2 (%v/v)	H2S (ppm)	CO (ppm)	LEL (%)			
BH ref: WS05	0	0.0	0	0.0	0.2	21.1	0	0	0			
Time: 10.00	15	0.0	0	0.0	2.3	18.6	0	0	0			
Atmospheric Pressure (mb)	30	0.0	0	0.0	2.4	18.4	0	0	0			
Before: 1027	45	0.0	0	0.0	2.4	18.4	0	0	0			
After: 1027	60	0.0	0	0.0	2.4	18.3	0	0	0			
Well Condition: Good	120			0.0	2.4	18.3	0	0	0			
	180			0.0	2.4	18.3	0	0	0			
Well Diameter: 50mm												
										DRY	2.09	

Ground Gas Monitoring Data Sheet

Name of Site:	Royal Arsenal Riverside - Phases 18 - 19				
Project Code:	1508005.003				
Date: 15/04/2016	Equipment		Last Three Days		
Completed by: CH	Gas Analyser:	GFM 430	Atmospheric Trend:		
Authorised by: ET	Condition:	Good	Temperature Range:		
	Dipmeter:	Dual Phase	Rainfall:		
	Condition:	Good			

On-site Weather Conditions: Sunny, dry

General Site Conditions / Ground Conditions / On site Activities:

Sub-contractors present onsite

GAS MONITORING TO BE UNDERTAKEN IN ACCORDANCE WITH TEC METHOD STATEMENT

Borehole Information	Time (seconds)	Borehole Flow Rate (l/hr)	DP (Pa)	Gas Concentrations						Groundwater Level	Borehole Depth	Comments
				CH4 (%v/v)	CO2 (%v/v)	O2 (%v/v)	H2S (ppm)	CO (ppm)	LEL (%)			
BH ref: WS03	0	0.0	0	0.0	0.0	20.1	0	0	0			
Time: 10.15	15	0.3	0	0.0	4.1	15.9	0	0	0			
Atmospheric Pressure (mb)	30	0.0	0	0.0	4.2	15.4	0	0	0			
Before: 1027	45	0.0	0	0.0	4.2	15.3	0	0	0			
After: 1027	60	0.0	0	0.0	4.2	15.2	0	0	0			
Well Condition: Good	120			0.0	4.2	15.2	0	0	0			
	180			0.0	4.2	15.2	0	0	0			
Well Diameter: 50mm										Dry	3.09	

Borehole Information	Time (seconds)	Borehole Flow Rate (l/hr)	DP (Pa)	Gas Concentrations						Groundwater Level	Borehole Depth	Comments
				CH4 (%v/v)	CO2 (%v/v)	O2 (%v/v)	H2S (ppm)	CO (ppm)	LEL (%)			
BH ref: WS06	0	0.1	0	0.0	0.1	21.5	0	0	0			
Time: 10.40	15	0.0	0	0.0	0.4	21.1	0	0	0			
Atmospheric Pressure (mb)	30	0.0	0	0.0	0.5	20.7	0	0	0			
Before: 1026	45	0.0	0	0.0	0.8	20.4	0	0	0			
After:1027	60	0.0	0	0.0	0.9	20.2	0	0	0			
Well Condition: Good	120			0.0	1.0	20.0	0	0	0			
	180			0.0	1.1	19.9	0	0	0			
Well Diameter: 50mm	240			0.0	1.1	19.9	0	0	0			
										DRY	3.07	

Ground Gas Monitoring Data Sheet

Name of Site:	Royal Arsenal Riverside - Phases 18 - 19				
Project Code:	1508005.003				
Date: 20/04/2016	Equipment		Last Three Days		
Completed by: CH	Gas Analyser:	GFM 430	Atmospheric Trend:		
Authorised by: ET	Condition:	Good	Temperature Range:		
	Dipmeter:	Dual Phase	Rainfall:		
	Condition:	Good			

On-site Weather Conditions: Sunny , dry

General Site Conditions / Ground Conditions / On site Activities:

Sub-contractors present onsite

GAS MONITORING TO BE UNDERTAKEN IN ACCORDANCE WITH TEC METHOD STATEMENT

Borehole Information	Time (seconds)	Borehole Flow Rate (l/hr)	DP (Pa)	Gas Concentrations						Groundwater Level	Borehole Depth	Comments
				CH4 (%v/v)	CO2 (%v/v)	O2 (%v/v)	H2S (ppm)	CO (ppm)	LEL (%)			
BH ref: BH01a	0	0.0	0	0.0	1.8	20.1	0	0	0			
Time: 09.30	15	0.3	3	0.0	20.1	19.8	0	0	0			
Atmospheric Pressure (mb)	30	0.3	3	0.0	2.4	18.9	0	0	0			
Before: 1021	45	0.1	1	0.0	2.4	18.9	0	0	0			
After: 1021	60	0.1	1	0.0	2.4	18.8	0	0	0			
Well Condition: Good	120	0.1	1	0.0	2.4	18.7	0	0	0			
	180			0.0	2.4	18.7	0	0	0			
Well Diameter: 50mm										10.15	12.07	

Borehole Information	Time (seconds)	Borehole Flow Rate (l/hr)	DP (Pa)	Gas Concentrations						Groundwater Level	Borehole Depth	Comments
				CH4 (%v/v)	CO2 (%v/v)	O2 (%v/v)	H2S (ppm)	CO (ppm)	LEL (%)			
BH ref: WS05	0	0.0	0	0.0	0	20.8	0	0	0			
Time: 10.00	15	0.0	0	0.0	1.8	20.1	0	0	0			
Atmospheric Pressure (mb)	30	0.0	0	0.0	1.9	19.8	0	0	0			
Before: 1021	45	0.0	0	0.0	2.2	19.4	0	0	0			
After: 1021	60	0.0	0	0.0	2.3	19.4	0	0	0			
Well Condition: Good	120			0.0	2.3	19.3	0	0	0			
	180			0.0	2.3	19.1	0	0	0			
Well Diameter: 50mm												
										DRY	2.10	

Ground Gas Monitoring Data Sheet

Name of Site:	Royal Arsenal Riverside - Phases 18 - 19		
Project Code:	1508005.003		
Date: 20/04/2016	Equipment	Last Three Days	
Completed by: CH	Gas Analyser: GFM 430	Atmospheric Trend:	
Authorised by: ET	Condition: Good	Temperature Range:	
	Dipmeter: Dual Phase	Rainfall:	
	Condition: Good		

On-site Weather Conditions: Sunny , dry

General Site Conditions / Ground Conditions / On site Activities:

Sub-contractors present onsite

GAS MONITORING TO BE UNDERTAKEN IN ACCORDANCE WITH TEC METHOD STATEMENT

Borehole Information	Time (seconds)	Borehole Flow Rate (l/hr)	DP (Pa)	Gas Concentrations						Groundwater Level	Borehole Depth	Comments
				CH4 (%v/v)	CO2 (%v/v)	O2 (%v/v)	H2S (ppm)	CO (ppm)	LEL (%)			
BH ref: WS03	0	0.0	0	0.0	0.0	20.3	0	0	0			
Time: 10.15	15	0.0	0	0.0	3.5	18.1	0	0	0			
Atmospheric Pressure (mb)	30	0.0	0	0.0	3.7	17.8	0	0	0			
Before: 1021	45	0.0	0	0.0	3.9	17.4	0	0	0			
After: 1021	60	0.0	0	0.0	4.1	17.4	0	0	0			
Well Condition: Good	120			0.0	4.2	16.9	0	0	0			
	180			0.0	4.2	16.8	0	0	0			
Well Diameter: 50mm										Dry	3.07	

Borehole Information	Time (seconds)	Borehole Flow Rate (l/hr)	DP (Pa)	Gas Concentrations						Groundwater Level	Borehole Depth	Comments
				CH4 (%v/v)	CO2 (%v/v)	O2 (%v/v)	H2S (ppm)	CO (ppm)	LEL (%)			
BH ref: WS06	Unable to monitor due to material storage on and in proximity to borehole											
Time: 10.40												
Atmospheric Pressure (mb)												
Before: 1021												
After:1021												
Well Condition: Good												
Well Diameter: 50mm												