



**HAMMERSMITH MAGISTRATES COURT  
TALGARTH ROAD, LONDON W6 8DN**

**PHASE 1 PRELIMINARY RISK ASSESSMENT AND PHASE 2  
ENVIRONMENTAL SITE INVESTIGATION REPORT**

**FOR**

***HM COURTS & TRIBUNALS SERVICE (HMCTS)***



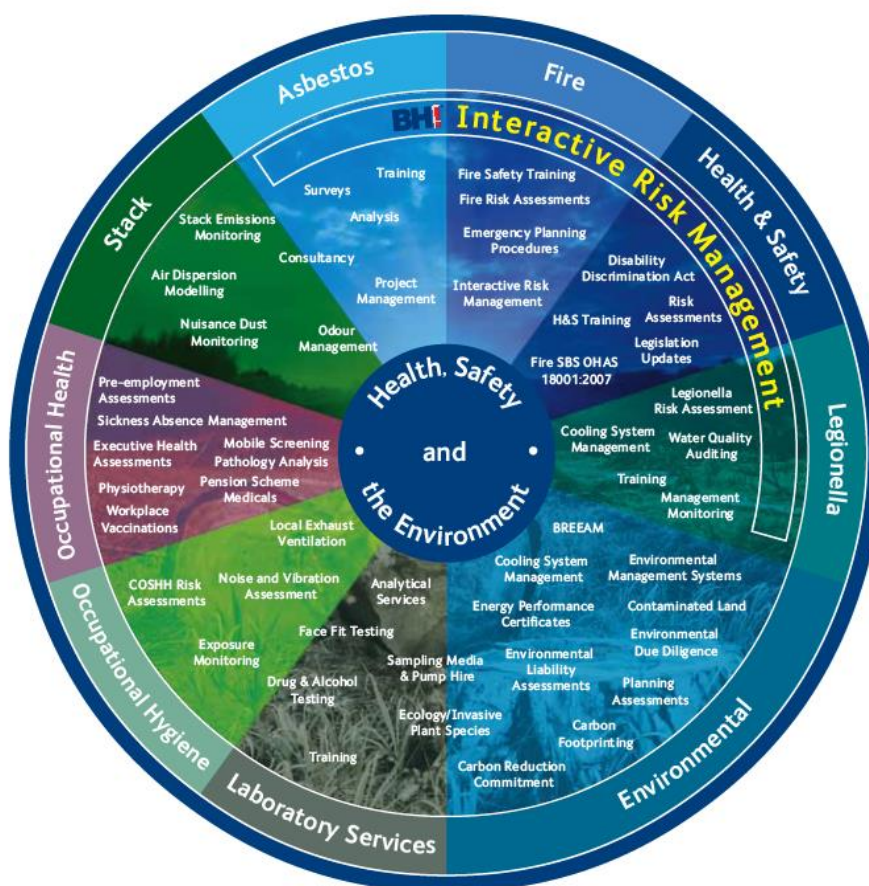
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## EXECUTIVE SUMMARY

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*RPS Health, Safety & Environment (RPS) was commissioned by HM Courts & Tribunals Service (HMCTS) to undertake a Phase 1 Preliminary Environmental Risk Assessment and a Phase 2 Environmental Site Investigation at Hammersmith Magistrates Court, Talgarth Road, London W6 8DN. The report has been commissioned for due diligence purposes in relation to the proposed divestment of the site.*

*The Phase 1 Preliminary Risk Assessment for the site identified a number of potential pollutant linkages to human health receptors associated with the site. A Phase 2 Environmental Site Investigation was therefore undertaken to determine whether these linkages were active.*

*The intrusive investigation comprised three cable percussion boreholes to depths of up to 6.00m below ground level (bgl). Groundwater and ground gas monitoring wells were installed in each of the boreholes.*

*Made Ground was encountered from the ground surface at each exploratory hole position. This was underlain by the Kempton Park Gravel Formation and then the London Clay Formation.*

*No contaminants of concern were recorded within soil or groundwater samples analysed at concentrations in excess of their adopted assessment criteria (AC).*

*Based on the findings of this assessment, the potential risk to human health and controlled water receptors from concentrations of contaminants of concern detected within soil and groundwater sampled from beneath the site is considered to be **LOW**.*

*Based on limited ground gas monitoring undertaken on site as part of the current investigation, CIRIA Characteristic Situation 1 (CS1) is applicable to the site, whereby no ground gas protection measures are required. The risk posed by ground gas to human health receptors and infrastructure is therefore considered to be **LOW**.*

*In view of the above, RPS considers there to be a low likelihood of environmental liability associated with the current use and form of the site. The likelihood of ground contamination issues significantly affecting value and saleability is considered to be low. Overall, the site is considered acceptable as security from an environmental risk perspective.*

# 1 INTRODUCTION

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## 1.1 Preamble

RPS Health, Safety & Environment (RPS) was commissioned by *HM Courts & Tribunals Service (HMCTS)* to undertake a Phase 1 Preliminary Environmental Risk Assessment and a Phase 2 Environmental Site Investigation at Hammersmith Magistrates Court, Talgarth Road, London W6 8DN. The report has been commissioned for due diligence purposes in relation to the proposed divestment of the site.

## 1.2 Scope of Work

The scope of works for this report was as follows:

- To undertake a site inspection;
- To review the historical land uses to assess the potential for ground contamination;
- To review the environmental setting to assess the sensitivity of the surrounding area to contamination/pollution;
- To undertake a qualitative environmental risk assessment of the site's current use;
- Produce a Conceptual Site Model (CSM) detailing potential pollutant linkages;
- To determine the contamination status of soil and groundwater beneath the site; and
- To assess whether contamination is present within soil and/or groundwater beneath the site at concentrations that could impact site users/occupiers and the wider environment.

## 1.3 Legislation and Guidance

This report has been produced in general accordance with:

- Contaminated Land (England) Regulations 2006 (as amended);
- DEFRA Environmental Protection Act 1990: Part 2A - *Contaminated Land Statutory Guidance (2012)*;
- Environment Agency (EA) Contaminated Land Report 11 (CLR 11): *Model Procedures for the Management of Land Contamination*;
- CIRIA Document C665: *Assessing Risks Posed by Hazardous Ground Gases to Buildings*;
- British Standard requirements for the 'Investigation of potentially contaminated sites - Code of practice' (ref. BS10175:2011);
- British Standard requirements for the 'Code of practice for ground investigations' (ref. BS5930:2015); and

- British Standard requirements for the '*Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings*' (ref BS8485:2015).

Where appropriate, consideration has also been given to the following:

- The potential for environmental liabilities to occur under other associated regimes, for example the *Water Resources Act (1991)* and the *Environmental Damage Regulations (2009)*.

Details of the limitations of this type of assessment are described in Appendix A.



## 2 SITE RECONNAISSANCE AND DESK STUDY

### 2.1 Site Reconnaissance

This section of the report is based upon observations made during a site walkover carried out on 30<sup>th</sup> September 2016. The site location and site boundary plans are shown as Figure 1 and Figure 2 respectively.



**General view of the site**

#### 2.1.1 The Site

**Table 1 – Summary of on-site activities**

Section	Description
<i>Background:</i>	The site is located in the southeast of Hammersmith, approximately 250m to the southeast of Hammersmith Underground Station. The site is located at National Grid Coordinates 523706, 178330. It is rectangular in shape and occupies an area of approximately 0.70ha.
<i>Site Layout, Activity / Operations:</i>	At the time of the walkover the site comprised Hammersmith Magistrates and Youth Courts and West London County Court. A site representative advised that the building was first in operation in 1996. The building occupied approximately 50% of the site. A car park was located in the south of the site, via an access road along the eastern boundary of the site. Access to the car park was restricted by a gate house and a barrier. A roadway was present along the northern boundary of the site. An area for pedestrian access to the building was present in the north of the site. Limited areas of raised soft landscaping were present around the perimeter of the site.  A plant room was located on the first floor of the building. Boilers, a water tank (see Appendix B, Photo 1) and an electrical switch room (see Appendix B, Photo 2) were

Section	Description
	present on the second floor.
<i>Building Structure(s):</i>	The court building comprised a part two-storey part-three storey brick structure. The upper floor was clad with metal panels. Two concertina shutter doors were located in the south of the building.
<i>Topography and Surface Cover:</i>	The site was generally flat. Steps and an access ramp were present up to the reception area of the building.  The access road and car parking area were laid to tarmac. Surface cover across the pedestrian areas to brick pavior and concrete paving slabs.
<i>Drainage:</i>	A number of manhole covers and box drains were noted within the tarmac area hardstanding across external areas of the site. No oil/water interceptors were identified during the site walkover.
<i>Bulk Storage / Tanks:</i>	Bulk storage of potentially contaminative substances was not observed on site during the walkover. A water tank (capacity approximately 15m <sup>3</sup> ) was located on the second floor.
<i>Waste:</i>	Five wheeled bins (each with a capacity of approximately 1,000 litres) for the storage of general waste were located to the south of the building in the car parking area (see Appendix B, Photo 3).
<i>Electrical Substations / Transformers:</i>	An electrical substation was located in the east of the car parking area. Signage indicated that this was owned by <i>UK Power Networks</i> .
<i>Visual Evidence of Contamination:</i>	No visual evidence of contamination was noted during the site walkover.
<i>Other Issues:</i>	No <i>Japanese Knotweed</i> or <i>Giant Hogweed</i> (invasive plant species) were readily identified on the site at the time of the survey. <i>(It should be noted that the identification can be limited by the seasons and in areas of dense vegetation growth.)</i>  An asbestos management survey had been undertaken for the building in July 2006 by <i>IOM Consulting</i> . The asbestos register had been updated in February 2013. The report stated that asbestos had not been identified at the site.

### 2.1.2 The Surrounding Area

The site is located in an area of commercial land use. At the time of the site inspection, neighbouring land consisted of the following:

**Table 2 – Neighbouring Land Uses**

Direction	Description
<i>North:</i>	Talgarth Road with Hammersmith Flyover and a hotel beyond.
<i>East:</i>	A BP petrol filling station.
<i>South:</i>	Hammersmith and District underground lines.
<i>West:</i>	Archive centre and office buildings.

## 2.2 Site History

### 2.2.1 Historical Map Review

The following review is based on past editions of readily available Ordnance Survey (OS) maps. These include scales of 1:1,056, 1:2,500 and 1:10,000 dated 1866 to 2014. Extracts from selected and historical maps are given as Figures 3 to 8.



**Table 3 – Historical Site Uses**

On-site Land Use and Features	Dates
The site comprised open rural fields/woodland. A circular tank of unspecified contents and capacity was indicated to be present in the centre of the site.	1867 to c.1893
A likely watercourse was indicated to be present from northeast to southwest through the southeastern quadrant of the site. <i>Then</i> watercourse is indicated to have been infilled.	1867 to c.1893 c.1893
Terraced buildings of unspecified use (likely residential) were present along the eastern and southern boundaries of the site. A section of Elric Street was indicated along the eastern boundary and a section of Lurgan Street was indicated to be present in the southeast quadrant of the site. Hammersmith Recreation Ground was indicated to occupy the majority of the site.	1893 to c.1963
An additional small structure of unspecified use was indicated in the southwest of the site.	1950 to c.1963
<i>Then</i> all the buildings on the site were no longer indicated to be present. The site comprised open land.	1963 to c.1974
A building of unspecified use (likely industrial or commercial) was indicated in the southeast of the site.	1974 to c.1987
The site was indicated to comprise vacant land.*	1987 to c.2002
A large building labelled as a Court occupied the majority of the site. **	2002 to Present

\* Planning records suggest that the site was potentially occupied by a car pound at this time.

\*\* Planning records suggest that the court building was constructed at some point after September 1989.

**Table 4 – Historical Neighbouring Site Uses**

Surrounding Land Uses (100m radius)	Orientation	Distance	Dates	
			From	To
Railway line	South	Adjacent	1893	Present
Remainder of Metropolitan Police car pound <i>Then</i> a large office building	West	Adjacent	1976 1989	c.1989 Present
Garage. <i>Then</i> extended. <i>Then</i> indicated to have been redeveloped with buildings of unspecified use, likely fuel filling station with car wash. <i>Then</i> redeveloped to the current configuration of the BP fuel filling station and car wash.	East	30m Adjacent	1957 1976 1987  2010	c.1976 c.1987 c.2010  Present
Two small buildings of unspecified use, likely related to the railway. <i>Then</i> redeveloped with additional buildings of unspecified use.	Southwest	30m	1896  1950	c.1950  c.2014
Garage. <i>Then</i> warehouse.	North	60m	1916 1950	c.1950 c.1976
Works	North	60m	1976	c.1987
Buildings of unspecified use, likely commercial or industrial.	North	75m	1867	c.1938
Travelling crane, two circular tanks and several small buildings of unspecified use, likely related to the railway. <i>Then</i> buildings, tanks and part of the travelling crane are no longer indicated. Replaced with two buildings of unspecified use. <i>Then</i> travelling crane no longer indicated. <i>Then</i> one building no longer indicated and the other was labelled as electricity substation.	Southwest	80m	1950  1963  1967 1976	c.1963  c.1976  c.1967 Present
Buildings of unspecified use, likely residential.	Northeast	80m	1867	c.1896
Several buildings of unspecified use, likely industrial or commercial. <i>Then</i> redeveloped and labelled as chocolate manufactory. <i>Then</i> no longer labelled.	Northwest	85m	1869  1916  c.1963	c.1916  c.1963  c.1963

Surrounding Land Uses (100m radius)	Orientation	Distance	Dates	
			From	To
Building of unspecified use, likely commercial or industrial.	Northeast	90m	1963	c.1993
Electricity substation	East	95m	1950	c.1957
Buildings of unspecified use and a chimney, likely industrial.	Southwest	95m	1916	c.1950
<i>Then</i> redeveloped and labelled electricity works.			1950	c.1974
Trolley bus depot.	Northwest	100m	1950	c.1963
<i>Then</i> coach repair works.			1963	c.1983

### 2.2.2 Site Planning History

The following planning applications were available on the London Borough of Hammersmith and Fulham planning website:

- 1983/00120/GOV: Extension to car pound. Dated 20<sup>th</sup> January 1983. No objection to proposal;
- 1985/01418/GOV: Erection of a Magistrates Court (outline scheme). Dated 16<sup>th</sup> July 1985. No objection to proposal. On the decision notice for this application, reference was made to the site formerly comprising a Metropolitan Police car pound site; and
- 1988/01940/GOV: Erection of a part-two part-three storey building for use as a Magistrates Court. Dated 20<sup>th</sup> September 1989. No objection to proposal.

No conditions relating to the investigation of potentially contaminated land were attached to the decision notices for these planning applications.

## 2.3 Environmental Setting

### 2.3.1 Geology

Based on British Geological Survey (BGS) mapping (1:50,000-scale) and EA Groundwater Vulnerability mapping (1:100,000-scale), the stratigraphic sequence and aquifer classifications beneath the site are as follows:

**Table 5 – Descriptions of Geological Strata**

Strata	Description & approximate thickness	Aquifer Classification
Kempton Park Gravel Formation	Sand and gravel. Likely to be up to several metres in thickness beneath the site.	Secondary A Aquifer
London Clay Formation	Blue-grey or grey-brown, silty calcareous, silty to very silty clay. Likely to be up to 50m in thickness beneath the site.	Unproductive Stratum
Lambeth Group	Variable sequences of silty and sandy clay, with some sands and gravels likely to be a few metres in thickness beneath the site.	Secondary A Aquifer

Strata	Description & approximate thickness	Aquifer Classification
Thanet Formation	Fine-grained sand. Likely to be up to 10m in thickness beneath the site.	Secondary A Aquifer
White Chalk Subgroup	Chalk with flints and discrete marl seam. Likely to be in excess of 100m in thickness beneath the site.	Principal Aquifer

In addition to the strata detailed above, Made Ground is likely to be present beneath the site as a result of previous construction and demolition activities.

Three historic BGS borehole records are available for the site (ref: TQ27NW/162, TQ27NW/163 and TQ27NW/164), drilled to a maximum depth of 18.30m. Made Ground was recorded in two of these boreholes to a maximum thickness of 1.50m. The Kempton Park Gravel Formation (approximately 6.00m in thickness) was present at ground level or beneath the Made Ground (where present) underlain by the London Clay Formation (maximum unproven thickness of 11.50m).

Groundwater levels were recorded in two of the boreholes at depths ranging from approximately 5.55m to 5.65m below ground level (bgl), towards the base of the Kempton Park Gravel Formation.

### 2.3.2 Hydrogeology

EA mapping indicates that the site overlies a Secondary A Aquifer, relating to the Kempton Park Gravel Formation. These formations are formed of permeable layers capable of supporting water supplies at a local scale, in some cases forming an important source of base flow to rivers. The Lambeth Group and Thanet Formation are also classified as a Secondary A Aquifers.

The London Clay Formation, indicated to be present beneath the Kempton Park Gravel Formation is classified as an Unproductive Stratum. These are formations with low permeability that have negligible significance for water supply of river base flow.

The White Chalk Subgroup, indicated to be present beneath the Thanet Formation is classified as a Principal Aquifer. These formations provide a high level of water storage and may support water supply and/or river base flow on a strategic scale.

According to EA data, the site is not located in a groundwater Source Protection Zone (SPZ).

Information provided by the EA indicates that there are no records of active licensed groundwater abstractions within 1km of the site.

The chemical quality of groundwater beneath the site has not been classified under the EA Local River Basin Management Plan.

### **2.3.3 Surface Water**

The River Thames is present approximately 700m to the southwest of the site at its closest point. Under the EA Local River Basin Management Plan, the chemical quality of this watercourse has been classified as ~~good~~ and the ecological quality as ~~moderate~~.

EA data indicated that there are no records of active licenced surface water abstractions within 1km of the site.

### **2.3.4 Fluvial / Tidal Flood Risk**

According to the EA flood map for planning (rivers and the sea), the east of the site is indicated to be located within Flood Zone 3, with the annual probability of flooding classified as greater than 1 in 100 (1%). The centre of the site is indicated to be located within a Flood Zone 2, with the annual probability of flooding classified as greater than 1 in 1000 (0.1%) but less than 1 in 100 (1%).

The floodplain appears to be associated with the River Thames. The EA Flood Map shows the predicted extent of flooding not taking into account the effect of flood defences (if present). Much of the surrounding area is also within the projected floodplain of the River Thames. The site appears to benefit to an extent from flood defences.

### **2.3.5 Ecologically Sensitive Sites**

Natural England data indicates that there are no ecologically sensitive sites that constitute environmental receptors as defined within Table 1 of the DEFRA Environmental Protection Act 1990: Part 2A - Contaminated Land Statutory Guidance (2012), located within a 1km radius of the site.

### **2.3.6 Radon**

According to the Indicative Atlas of Radon in England and Wales published by the Health Protection Agency (part of Public Health England) and the BGS, the site is located in a low risk area from radon gas, whereby less than 1% of homes are above the action level.

### 2.3.7 Coal Authority

According to Coal Authority data, the site is not located in an area potentially affected by coal mining activities.

### 2.3.8 Unexploded Ordnance (UXO)

The London County Council Bomb Damage Maps 1939-1945 indicate that several terraced buildings adjacent to the west of the site were subject to minor blast damage during World War 2.

## 2.4 Authorised Processes and Pollution Incidents

### 2.4.1 Landfills and Waste Sites

Information provided by the EA, Local Authority and BGS indicates there are no current or historical landfill sites or waste treatment/transfer sites recorded within 500m of the site.

### 2.4.2 Environmental Permits

EA and Local Authority data indicates that there are five active processes regulated by an Environmental Permit (under the Environmental Permitting Regulations 2010) registered within 500m of the subject site. These are outlined in the table below:

**Table 6 – Environmental Permits**

Licence Holder	Permitted Activity	Approx. Distance and Direction from Site
BP Hammersmith Flyover Service Station	Petrol filling station	Adjacent East
Violet Super Dry Cleaners	Dry cleaning	275m North
Imperial College of Science Technology and Medicine	Keeping and use of radioactive materials	375m South
Imperial College Healthcare NHS Trust	Disposal of radioactive waste	375m South

### 2.4.3 COMAH Sites

There are no records of any operations under the Control of Major Accident Hazards (COMAH) Regulations 1999, located within 500m of the site.

### 2.4.4 Pollution Incidents

EA data indicates that there are no records of any significant or major pollution incidents within 500m of the site.





## 2.5 Regulatory Consultations

The Environmental Health Department at Hammersmith and Fulham London Borough Council was contacted regarding any known contamination issues at the site. ***RPS is currently awaiting a response.***

The London Fire and Emergency Planning Authority were contacted regarding records of any above or below ground flammable fuel storage present at the site (either currently or historically). The search identified no historic or current fuel storage at the site.

### 3 PRELIMINARY CONCEPTUAL SITE MODEL

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#### 3.1 Background

A preliminary conceptual site model (CSM) consists of an appraisal of the *source-pathway-receptor* 'contaminant linkages' which is central to the approach used to determine the existence of 'contaminated land' according to the definition set out under Part 2A of the Environmental Protection Act 1990. For a risk to exist (under Part 2A), all three of the following components must be present to facilitate a potential 'pollutant linkage'.

- **Source** referring to the source of contamination.
- **Pathway** for the contaminant to move/migrate to receptor(s).
- **Receptor** that could be affected by the contaminant(s).

Receptors include human beings, other living organisms, crops, controlled waters and buildings / structures. The National Planning Policy Framework, used to address contaminated land through the planning process, follows the same principles as those set out under Part 2A. Further details on the Part 2A regime are presented within Appendix C.

#### 3.2 Potential Pollutant Linkages

Each stage of the potential pollutant linkages have been assessed individually on the basis of information obtained during the site reconnaissance and desk study exercise and is discussed in the following section.

##### 3.2.1 Potential Contaminant Sources

###### **On Site**

A circular tank was indicated to be present in the centre of the site from 1867 to c.1893. Given the rural setting, it is considered unlikely to have contained hazardous substances and is therefore not considered a potential source of contaminants of concern. A likely watercourse ran northeast to southwest through the southeastern quadrant of the site from 1867 and was indicated to have been infilled by c.1893. Given the significant time since this feature was indicated to be present, it is not considered to be a potential source of contaminants of concern.

A building of unspecified use (likely industrial or commercial) was indicated to be present in the southeast of the site from 1974 to c.1987. A planning application for the site, dated January 1983, related to the extension of a car pound, and it is therefore considered likely that this building of

unspecified use relates to the Metropolitan Police car pound that potentially occupied the site at this time.

Potentially contaminative land uses identified on the site during the walkover included an electricity substation located in the southeast of the site.

Made Ground, indicated to be present beneath parts of the site, is considered to represent a potential source of contaminants of concern and ground gas.

### ***Off-Site***

Former potentially contaminative land uses in the vicinity of the site include the Metropolitan Police car pound (which extended off-site to the west); a garage, subsequently a warehouse; a works; buildings of unspecified use (likely commercial or industrial); and infrastructure relating to the railway, including a travelling crane and tanks.

Current potentially contaminative land uses in the vicinity of the site include a petrol filling station located adjacent to the east of the site and a railway line to the south.

### **3.2.2 Potential Pathways**

Surfacing across the site currently comprises building cover, hardstanding and limited areas of soft landscaping. In areas of the building and hardstanding, the potential risks to human health receptors *via* the pathways of dermal contact and ingestion will be mitigated. However, in areas of soft landscaping, the pathways of dermal contact and ingestion could be active. In addition, there would be potential for the airborne migration of soil/dust from these areas.

There is the potential for ground gas and volatile contaminants of concern in soil and/or groundwater beneath the site to impact future site users *via* the inhalation pathway in indoor areas.

Groundwater within granular layers of the underlying Made Ground and the Kempton Park Gravel Formation may constitute a potential pathway for the off-site migration of contaminants of concern (where present).

Potential contaminants of concern associated with current and historical land uses in the vicinity of the site also have the potential to migrate onto site *via* groundwater within the underlying permeable strata.

### 3.2.3 Potential Receptors

Potential human health receptors include current court employees, visitors to the site and those within neighbouring commercial properties.

The site is situated above a Secondary A Aquifer relating to the Kempton Park Gravel Formation. There is considered potential for contaminants of concern (if present) to impact this controlled water receptor.

The likely significant thickness of London Clay Formation (present beneath the Kempton Park Gravel Formation) will provide protection to the underlying Lambeth Group and Thanet Formation (both classified as Secondary A Aquifers) and the deeper White Chalk Subgroup (classified as a Principal Aquifer). The site is not located within a groundwater SPZ and there are no licensed groundwater abstractions indicated to be present within 1km.

The nearest surface water feature is the River Thames, located approximately 700m to the southwest of the site at its closest point. Given its distance, this watercourse is not considered to be at significant risk from potential contaminants of concern sourced from the site and has not been considered further as a receptor as part of this assessment.

### 3.3 Preliminary Conceptual Site Model

A preliminary CSM has been developed on the basis of the site reconnaissance and desk study. The CSM is used to identify potential sources, pathways and receptors (i.e. potential pollutant linkages) on site and is summarised in the table below:

**Table 7 - Preliminary Conceptual Site Model**

Potential Source	Contaminants of Concern	Via	Potential Pathways	Linkage Potentially Active?	Receptors
<b>On site – current:</b> Made Ground and electricity substation  <b>On site - historical:</b> Potential Metropolitan Police car pound	Metals, hydrocarbons, asbestos and polychlorinated biphenyls (PCBs)	Soil	Dermal contact/ingestion	✓	Site users
			Inhalation of volatiles	✓	Site users
			Airborne migration of soil or dust	✓	Off-site users
			Leaching of mobile contaminants	✓	Kempton Park Gravel Formation Secondary A Aquifer
		Groundwater	Dermal contact/ingestion	✓ ✓	Site users Off-site users
			Inhalation of volatiles	✓ ✓	Site users Off-site users
			Vertical and lateral migration in permeable strata	✓	Kempton Park Gravel Formation Secondary A Aquifer

Potential Source	Contaminants of Concern	Via	Potential Pathways	Linkage Potentially Active?	Receptors
<b>Off site – historical:</b> Metropolitan Police car pound; garage, warehouse; works; buildings of unspecified use (likely commercial or industrial); and infrastructure relating to the railway  <b>Off-site – current:</b> Petrol filling station and railway line	Metals and hydrocarbons	Groundwater	Dermal contact/ingestion	✓	Site users
			Inhalation of volatiles	✓	Site users
<b>On and off-site –</b> Made Ground, natural strata or bio-degradation of contamination	Carbon dioxide and methane	Ground Gas	Inhalation of ground gas	✓ ✓	Future site users Site users
			Explosive risks	✓ ✓	Future site users Site users



## 4 INTRUSIVE SITE INVESTIGATION

### 4.1 Introduction

An intrusive site investigation has been carried out in order to provide an assessment of whether pollutant linkages identified within the preliminary CSM (presented as Table 7) are currently active at the site.

### 4.2 Description of Works

Site investigation works were carried out on the 27<sup>th</sup> and 28<sup>th</sup> October 2016 and comprised:

- Three cable boreholes (BH1 to BH3) to depths of up to 5.90m bgl; and
- Installation of groundwater/gas monitoring wells in all three boreholes.

The rationale behind each exploratory hole location is summarised in the table below. An exploratory hole location plan is provided as Figure 2.

**Table 8 – Exploratory Hole Rationale**

Exploratory Hole	Location on Site	Rationale
BH1	Northeast	Located in the vicinity of the petrol filling station (located adjacent to the east of the site), to determine the risk from this potential source of contaminants of concern.
BH2	Southwest	Located to provide general environmental site coverage.
BH3	Southeast	Located in the vicinity of the petrol filling station (located adjacent to the east of the site) and the on site electricity substation.

The soil arisings from each exploratory hole were carefully examined for visual and olfactory evidence of contamination.

A return visit for groundwater sampling was carried out on 3<sup>rd</sup> November 2016. The monitoring wells were inspected for the presence of free-phase hydrocarbon product using an oil/water interface probe and the depth to groundwater was recorded prior to sampling.

Ground gas monitoring was undertaken on one occasion on 3<sup>rd</sup> November 2016. Installations were monitored for concentrations of methane, carbon dioxide, carbon monoxide, hydrogen sulphide, oxygen and iVOCs. In addition, the flow rate and barometric pressure were recorded.

## 4.3 Laboratory Testing

### 4.3.1 Environmental Laboratory Testing - Soil

Four samples of Made Ground and two samples of Kempton Park Gravel Formation were submitted to a UKAS/MCERTS accredited laboratory and analysed for a number of determinands including:

***Inorganic Determinands:***

*pH, arsenic, cadmium, chromium, hexavalent chromium, copper, lead, mercury, nickel, sulphide, total cyanide, sulphate, sulphur, selenium, zinc and asbestos.*

***Organic Determinands:***

*Polycyclic aromatic hydrocarbons (PAH), speciated total petroleum hydrocarbons (TPH CWG) including benzene, toluene, ethylbenzene and xylenes (BTEX) and methyl tert-butyl ether (MTBE), polychlorinated biphenyls (PCBs) and monohydric phenol.*

### 4.3.2 Environmental Laboratory Testing - Groundwater

Three groundwater samples were collected during the monitoring visit from monitoring wells BH1, BH2 and BH3, screened within the Made Ground and Kempton Park Gravel Formation, and analysed by a UKAS/MCERTS accredited laboratory for a number of determinands including:

***Inorganic Determinands:***

*pH, arsenic, cadmium, chromium, hexavalent chromium, copper, lead, mercury, nickel, selenium, zinc, sulphate, sulphide and total cyanide.*

***Organic Determinands:***

*Total organic carbon, PAH, TPH CWG including BTEX and MTBE, PCBs and monohydric phenol.*

## 5 SITE INVESTIGATION FINDINGS

### 5.1 Ground Conditions

The strata encountered during the intrusive investigation are summarised in the table below, and described in the following section.

**Table 9 – Encountered Strata**

Strata	Depth to Top of Strata (m bgl)	Thickness (m)
Made Ground	Ground level	1.40 to 2.40
Kempton Park Gravel Formation	1.40 to 2.40	3.20 to 4.50
London Clay Formation	5.20 to 5.90	>0.10 (full thickness not proven)

General descriptions of the strata encountered during the intrusive investigation are summarised below. Reference should be made to the exploratory hole logs within Appendix D of this report for full descriptions of ground conditions underlying the site.

#### **Made Ground**

Made Ground was encountered from the ground surface at each exploratory hole position and ranged in thickness from 1.40m to 2.40m.

The stratum was variable in nature, comprising clayey sandy gravel, sandy gravel and gravelly clay.

#### **Kempton Park Gravel Formation**

The Kempton Park Gravel Formation was encountered beneath the Made Ground and was proven to a maximum depth of 5.90m bgl. The stratum generally comprised yellow orange sandy gravel.

#### **London Clay Formation**

The London Clay Formation was encountered beneath the Kempton Park Gravel Formation in all three of the boreholes. An unproven thickness of 0.10m was encountered in all the boreholes. The stratum comprised brown grey clay.

### 5.2 Groundwater

Groundwater levels could not be monitored during drilling works as water was added to aid drilling through the Kempton Park Gravel Formation. Groundwater levels recorded during the subsequent monitoring visit to site are summarised in the table below:

Table 10 – Groundwater Data

Monitoring Well ID	Well Screen Depth (m bgl)	Strata	Depth to Groundwater (m bgl)	Groundwater Elevation (mAOD)
			03/11/2016	03/11/16
BH1	1.00 to 6.00	Made Ground and Kempton Park Gravel Formation	4.193	0.224
BH2	1.00 to 5.80	Made Ground and Kempton Park Gravel Formation	4.914	-0.091
BH3	1.00 to 5.20	Made Ground and Kempton Park Gravel Formation	4.375	0.126

Free-phase product was not observed within groundwater during monitoring visits.

It is considered likely that the groundwater monitoring data above is representative of a continuous groundwater body within the Kempton Park Gravel Formation. Groundwater elevation data indicates that groundwater flow beneath the site is towards to the southwest, in the direction of the River Thames.

### 5.3 Field Evidence of Contamination

#### 5.3.1 Visual and Olfactory Evidence of Contamination

No visual or olfactory evidence of contamination was noted within soils or groundwater during intrusive works or the subsequent monitoring visit.

### 5.4 Ground Gas Monitoring

Ground gas monitoring was undertaken on one occasion, on 3<sup>rd</sup> November 2016. Installations were monitored for concentrations of methane, carbon dioxide and oxygen. In addition, the flow rate and barometric pressure were recorded. The results of the ground gas monitoring are presented in Appendix E.

Methane was not recorded at concentrations in excess of the instrument limit of detection (<0.1% by volume (v/v)). Carbon dioxide was recorded at a maximum concentration of 1.8% v/v within monitoring well BH3, screened within the Made Ground and Kempton Park Gravel Formation. Ground gas flow rates were not recorded above the instrument limit of detection (<0.1 litres per hour).

The lowest recorded oxygen concentration was 18.1% v/v within monitoring wells BH1 and BH3. Atmospheric pressure varied between 1021mb and 1020mb during the monitoring visit.

The CIRIA Report C665 *Assessing risks posed by hazardous ground gases to buildings* outlines indicative guideline concentrations for carbon dioxide and methane in association with gas flow rates for which gas protection measures may be required in new residential or commercial developments. The methodology is based on the Modified Wilson and Card approach that characterises the gas regime into a series of Characteristic Situations (1 to 5), with corresponding indicative gas protection measures. Using this methodology and on the basis of limited ground gas monitoring carried out as part of this investigation, the ground gas regime at this site corresponds to Characteristic Situation 1 (CS1), whereby no gas protection measures are required.



## 6 CHEMICAL RESULTS AND ASSESSMENT

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The field investigation findings indicate that pathways are present by which contaminants of concern can impact identified receptors. Chemical analysis has been carried out on soils and groundwater sampled from beneath the site. The concentrations of contaminants of concern within soil and groundwater can be compared to assessment criteria (AC) to determine whether these represent an unacceptable risk to identified receptors. The derivation of AC to be used and the comparison of these criteria to the results of the chemical analyses are presented below.

### 6.1 Human Health Assessment Criteria

In order to assess risks to site users, concentrations of contaminants of concern have been compared to Suitable 4 Use Levels (S4UL) generic Assessment Criteria (AC) published by Land Quality Management: Chartered Institute of Environmental Health (LQM:CIEH) in 2015. In accordance with the copyright notice the Publication Number for RPS Group is S4UL3177.

Given the current use of the site, the assessment has been based upon a commercial land use.

Soil Organic Matter (SOM) for soil samples collected from beneath the site ranged from 0.10% to 0.90%. Concentrations of contaminants of concern have therefore been compared to the most conservative S4UL (1.00% SOM) values.

A notable exclusion from the S4ULs is lead. In the absence of a S4UL for lead, the Category 4 Screening Level (C4SL) has been selected, published by DEFRA in 2014. It is noted that the C4SL are based on the acceptance of a low level of toxicological concern, rather than the more conservative standard adopted in the derivation of S4ULs, which are based on a tolerable or minimal level of risk.

The potential risk posed to controlled waters from contaminants of concern within soils beneath the site is not addressed by these screening criteria.

### 6.2 Comparison of Soil Analyses to Human Health Assessment Criteria

Chemical analysis was undertaken by a UKAS/MCERTS accredited laboratory on four samples of Made Ground and two samples of Kempton Park Gravel Formation. Analytical certificates for soils are presented in Appendix F. A comparison of soil analyses to the relevant assessment criteria is summarised below and presented as Appendix G.

### **6.2.1 Inorganic Determinands**

Inorganic contaminants of concern were not recorded within any of the soil samples collected from beneath the site at concentrations in excess of adopted AC.

### **6.2.2 PAH**

PAH contaminants of concern were not recorded within any of the soil samples collected from beneath the site at concentrations in excess of adopted AC.

### **6.2.3 TPH CWG (incl. BTEX/MTBE)**

TPH CWG contaminants of concern were not recorded within soil samples collected from beneath the site at concentrations in excess of adopted AC.

### **6.2.4 PCBs**

PCBs were not recorded at concentrations in excess of the laboratory limit of detection within the soil sample collected in the vicinity of the electricity substation.

### **6.2.5 Other Organic Determinands**

Monohydric phenol was not recorded within other soil samples collected from beneath the site at concentrations in excess of adopted AC.

### **6.2.6 Asbestos**

Asbestos containing materials (ACMs) were not identified in any of the soil samples submitted for screening.

## **6.3 Summary**

Contaminants of concern were not recorded within soil samples analysed from beneath the site at concentrations in excess of adopted AC, protective of commercial site users, as part of the investigation.

## 6.4 Groundwater Assessment Criteria

The preliminary conceptual site model identified a Secondary A Aquifer, relating to the Kempton Park Gravel Formation, to be present beneath the site that could potentially be sensitive to contaminants of concern (if present). However, the site does not lie within a groundwater SPZ and there are no records of active licensed groundwater abstractions within 1km of the site. As such, the results of the groundwater analysis have been compared to the Environmental Quality Standards (EQS) for freshwater. Where such values are not available, the UK Drinking Water Standard (DWS) values have been used.

The potential risk to on site human health receptors from contaminants of concern in groundwater is not addressed by these screening values.

## 6.5 Comparison of Groundwater Analysis to Controlled Waters Assessment Criteria

Groundwater samples were collected from monitoring wells BH1, BH2 and BH3 on a single occasion and submitted to a UKAS/MCERTS accredited laboratory for chemical testing. Analytical certificates for groundwater are presented in Appendix F.

A comparison of groundwater analyses to the relevant assessment criteria is summarised below and presented as Appendix G.

### 6.5.1 Inorganic Determinands

Inorganic contaminants were not recorded in the groundwater samples at concentrations in excess of their relevant screening criteria.

### 6.5.2 PAH

PAH compounds were not recorded in the groundwater samples at concentrations in excess of their relevant screening criteria.

### 6.5.3 TPH CWG (incl. BTEX/MTBE)

TPH CWG compounds including BTEX and MTBE were not recorded in the groundwater samples at concentrations in excess of their relevant screening criteria.



#### **6.5.4 PCBs**

PCBs were not recorded at concentrations in excess of the laboratory limit of detection within the groundwater sample collected from monitoring well BH3, located in the vicinity of the electricity substation.

#### **6.5.5 Other Organic Determinands**

Monohydric phenol was not recorded in the groundwater samples at concentrations in excess of the laboratory limit of detection.

## 7 REVISED CONCEPTUAL SITE MODEL

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The UK approach to the management of land contamination through the development process is risk-based, as was formerly implemented by Planning Policy Statement Number 23 (PPS23). PPS23 was formally withdrawn on 27<sup>th</sup> March 2012 and replaced by the National Planning Policy Framework.

The Local Authority is likely to have based their strategy for the implementation of the National Planning Policy Framework on the withdrawn PPS23. Therefore, this risk assessment will be based primarily on the withdrawn PPS23, with broad consideration for the contents of the National Planning Policy Framework.

The risk assessment methods adopted by PPS23 reflected those adopted by Part 2A of the Environmental Protection Act (1990). Part 2A identifies that harm to human health and the environment arises not solely from the presence of contaminating substances or ~~sources~~ but from their migration along a ~~pathway~~ to where they can impact a ~~receptor~~.

The potential pollutant linkages identified as part of the preliminary CSM have been assessed in light of the findings of the site investigation and are discussed below for each of the individual receptors identified.

### 7.1 Site Users

Contaminants of concern were not recorded within soil or groundwater samples collected from beneath the site at concentrations in excess of their adopted AC. Therefore, there is not considered to be a significant risk to site users *via* the dermal contact, ingestion and/or inhalation pathways.

Significant concentrations of volatile contaminants of concern were not recorded within soil or groundwater analysed from beneath the site.

Based on the available information, the potential risk to site users from concentrations of contaminants of concern detected within soil and groundwater sampled from beneath the site is considered to be **LOW**.

### 7.2 Maintenance Workers

S4ULs or C4SLs cannot be used to assess the acute (short term exposure) risk that personnel in close contact with exposed soils may experience during site maintenance duties.

Potential risks to maintenance workers can easily be controlled in most site areas by the use of appropriate personal protective equipment (disposable coveralls and gloves) and by adopting high levels of personal hygiene.

Providing contractors undertake and implement a site specific risk assessment and resulting mitigation measures are taken, based on the available information, the potential risk to maintenance workers is considered to be **LOW**.

### 7.3 Off-site Human Health Receptors

No contaminants of concern were recorded within soil or groundwater samples analysed at concentrations in excess of their adopted AC protective of human health receptors.

Based on the available information, the potential risk to off-site human health receptors from concentrations of contaminants of concern detected within soil and groundwater sampled from beneath the site is considered to be **LOW**.

### 7.4 Groundwater

Contaminants of concern were not recorded within groundwater sampled from beneath the site at concentrations in excess of adopted AC. Therefore, the potential risk to groundwater receptors from concentrations of contaminants of concern detected within groundwater sampled from beneath the site is considered to be **LOW**.

### 7.5 Structures and Infrastructure

#### 7.5.1 Buildings (on site)

Limited ground gas monitoring undertaken on site as part of the current investigation indicates that CIRIA CS1 is applicable to the site, whereby no gas protection measures are required.

The risk posed by ground gas to human health receptors and infrastructure is therefore considered to be **LOW**.

### 7.6 Revised Conceptual Site Model

The potential source-pathway-receptor linkages and associated risks in relation to the current commercial building on the site, as identified following completion of the assessment, are summarised in the table below.

Table 11 - Revised CSM

Potential Source	Contaminants of Concern	Via	Potential Pathways	Linkage Potentially Active?	Receptors
<b>On site – current:</b> Made Ground and electricity substation  <b>On site - historical:</b> Potential Metropolitan Police car pound	Metals, hydrocarbons, asbestos and polychlorinated biphenyls (PCBs)	Soil	Dermal contact/ingestion	×	Site users
			Inhalation of volatiles	×	Site users
			Airborne migration of soil or dust	×	Off-site users
			Leaching of mobile contaminants	×	Kempton Park Gravel Formation Secondary A Aquifer
		Groundwater	Dermal contact/ingestion	×	Site users Off-site users
			Inhalation of volatiles	×	Site users Off-site users
			Vertical and lateral migration in permeable strata	×	Kempton Park Gravel Formation Secondary A Aquifer
<b>Off site – historical:</b> Metropolitan Police car pound; garage, warehouse; works; buildings of unspecified use (likely commercial or industrial); and infrastructure relating to the railway  <b>Off-site – current:</b> Petrol filling station and railway line	Metals and hydrocarbons	Groundwater	Dermal contact/ingestion	×	Site users
			Inhalation of volatiles	×	Site users
<b>On and off-site –</b> Made Ground, natural strata or bio-degradation of contamination	Carbon dioxide and methane	Ground Gas	Inhalation of ground gas	×	Future site users Site users
			Explosive risks	×	Future site users Site users

Should ground conditions inconsistent with those outlined in this report be encountered RPS should be contacted to enable further assessment.

## 8 CONCLUSIONS AND RECOMMENDATIONS

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Contaminants of concern were not recorded within soil or groundwater samples collected from beneath the site at concentrations in excess of their adopted AC.

Based on the findings of this assessment, the potential risk to human health and controlled water receptors from concentrations of contaminants of concern detected within soil and groundwater sampled from beneath the site is considered to be **LOW**.

Limited ground gas monitoring undertaken on site as part of the current investigation indicates that CIRIA CS1 is applicable to the site, whereby no gas protection measures are required. The risk posed by ground gas to human health receptors and infrastructure is therefore considered to be **LOW**.

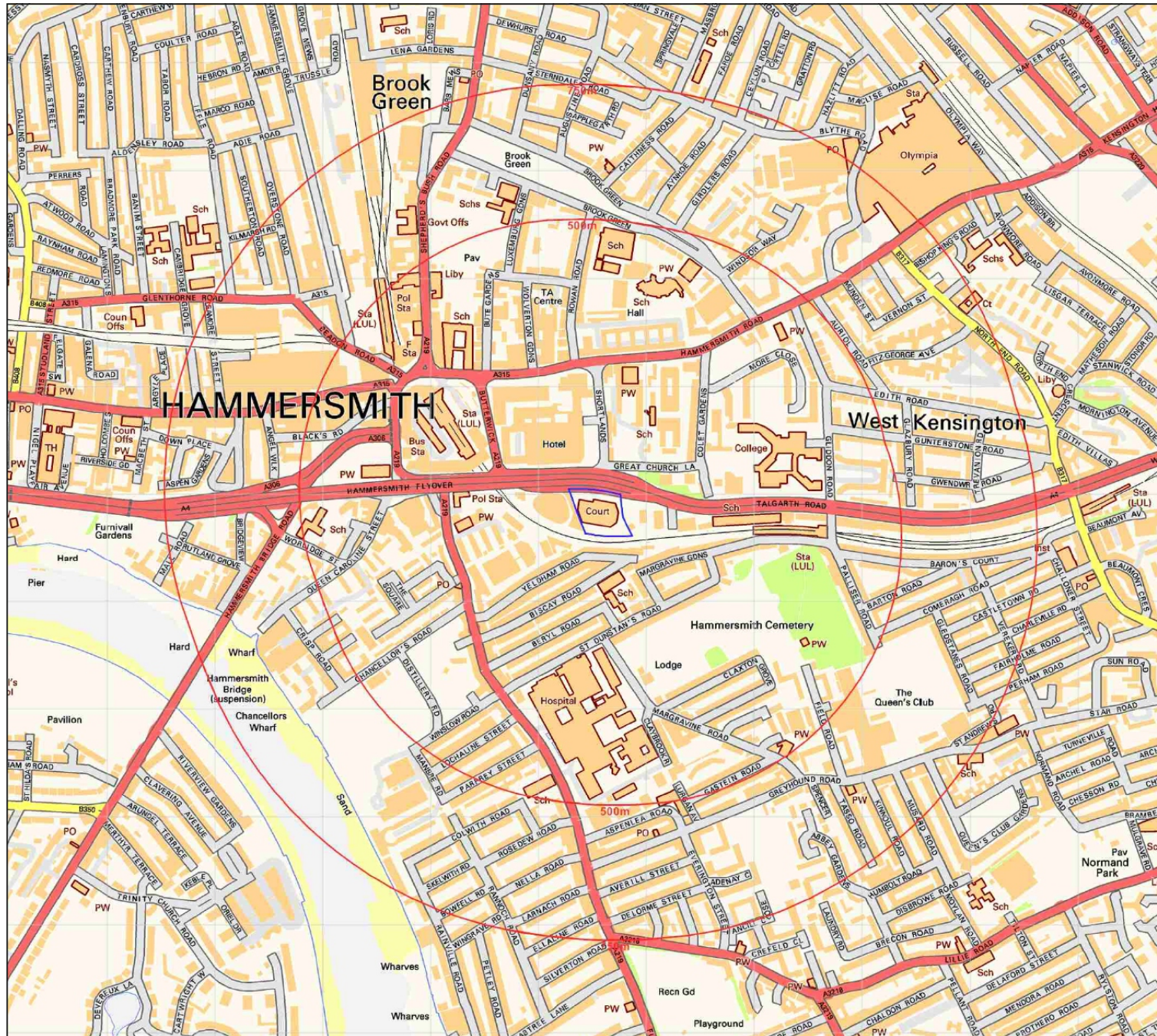
In view of the above, RPS considers there to be a low likelihood of environmental liability associated with the current use and form of the site. The likelihood of ground contamination issues significantly affecting value and saleability is considered to be low. Overall, the site is considered acceptable as security from an environmental risk perspective.



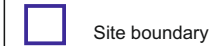


## FIGURES

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#### Legend



Map Date: 2014



35 New Bridge Street,  
London EC4V 6BW  
T 020 7280 3240  
F 020 7283 9248  
W [www.rpsgroup.com](http://www.rpsgroup.com)

Client: HM COURTS & TRIBUNALS  
SERVICE

Project: HAMMERSMITH  
MAGISTRATES COURTS

Title: SITE LOCATION PLAN

Job Ref: HLE45310 Scale: NTS Date: Nov 2016

Figure Number: 1 Rev: 0

[www.rpsgroup.com](http://www.rpsgroup.com)





#### Legend



Site boundary



Cable Percussive Borehole Location



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Client: HM COURTS & TRIBUNALS  
SERVICE

Project: HAMMERSMITH  
MAGISTRATES COURTS

Title: SITE BOUNDARY AND  
EXPLORATORY HOLE LOCATION  
PLAN

Job Ref:  
HLE45310

Scale:  
NTS

Date:  
Nov 2016

Figure Number: 2 Rev: 0

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**Figure 3:** Historical Map Extract

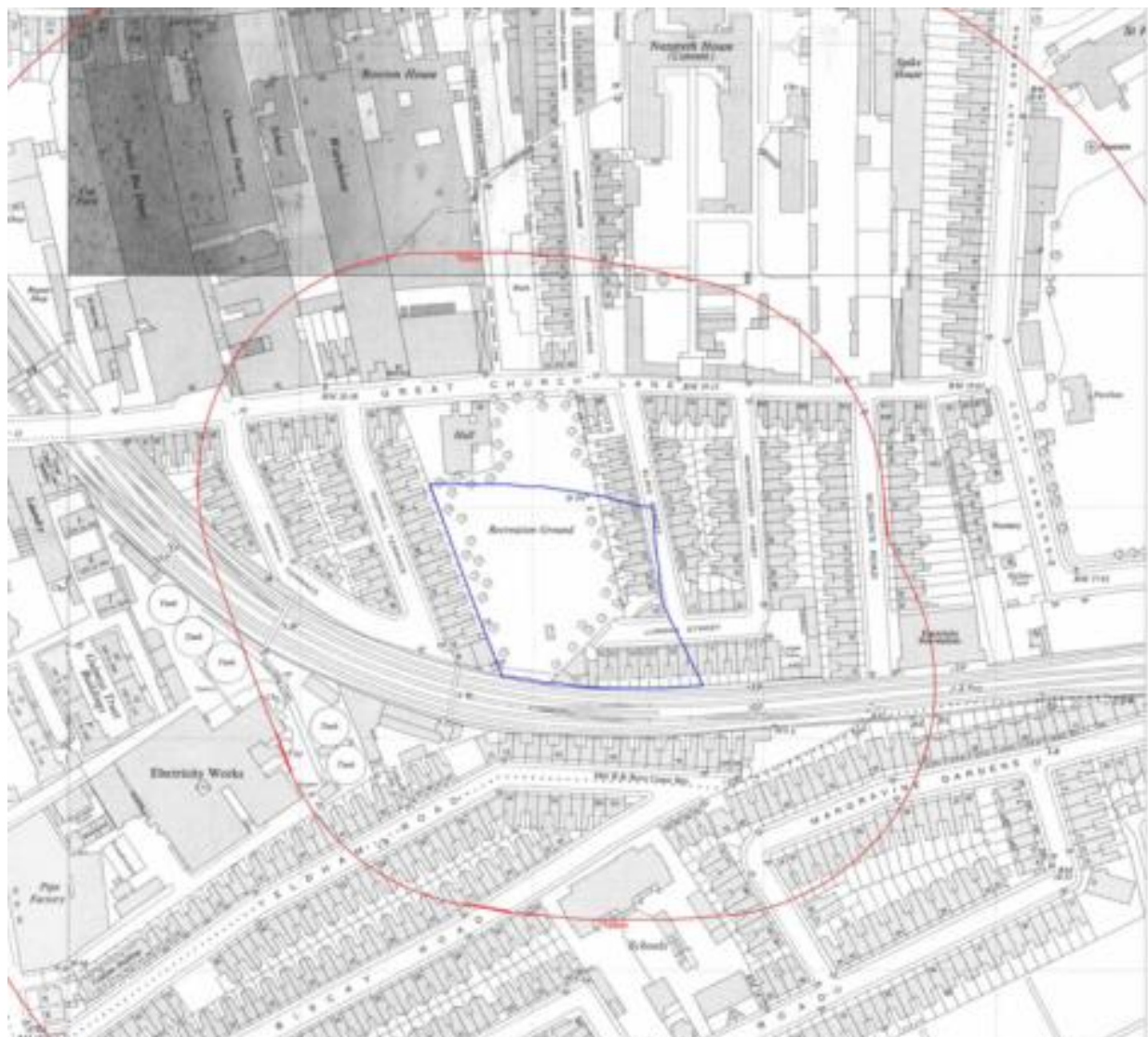
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**Scale:** Not to scale

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35 New Bridge Street  
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EC4V 6BW

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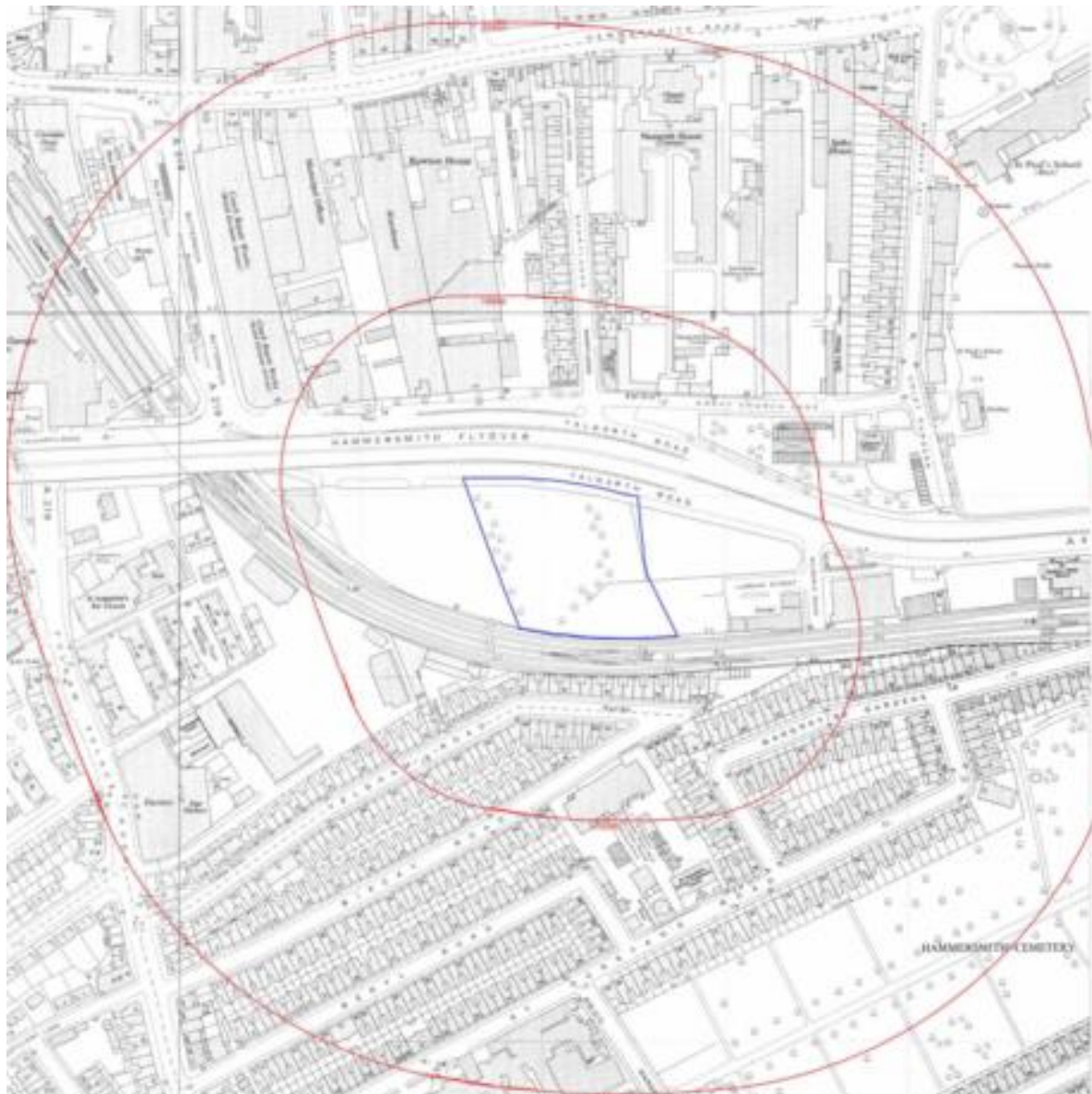
**Figure 4:** Historical Map Extract

**Map Date:** 1950

**Scale:** Not to scale

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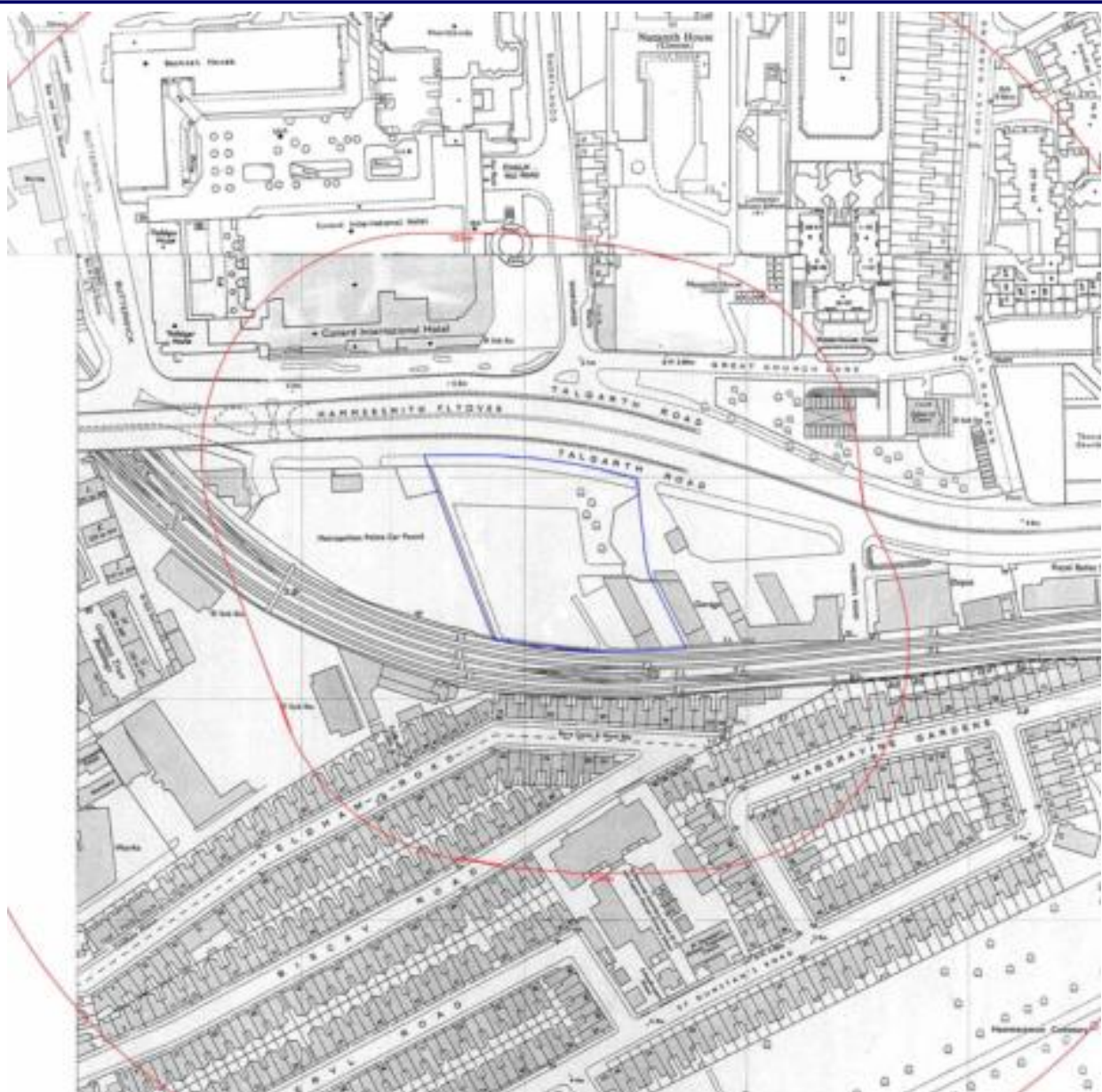
**Figure 5:** Historical Map Extract

**Map Date:** 1967

**Scale:** Not to scale

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EC4V 6BW

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**Figure 6:** Historical Map Extract

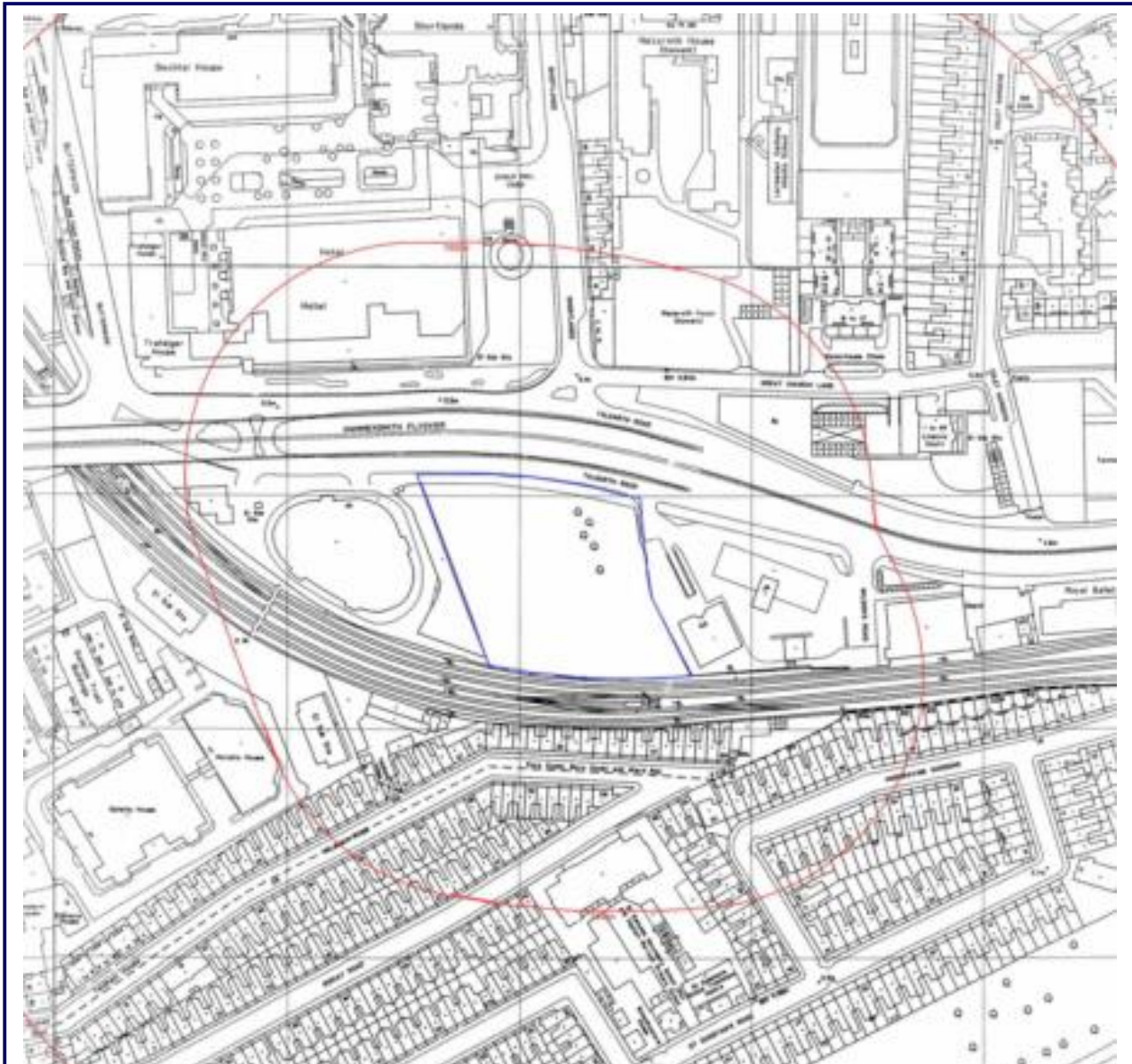
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EC4V 6BW

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**Figure 7:** Historical Map Extract

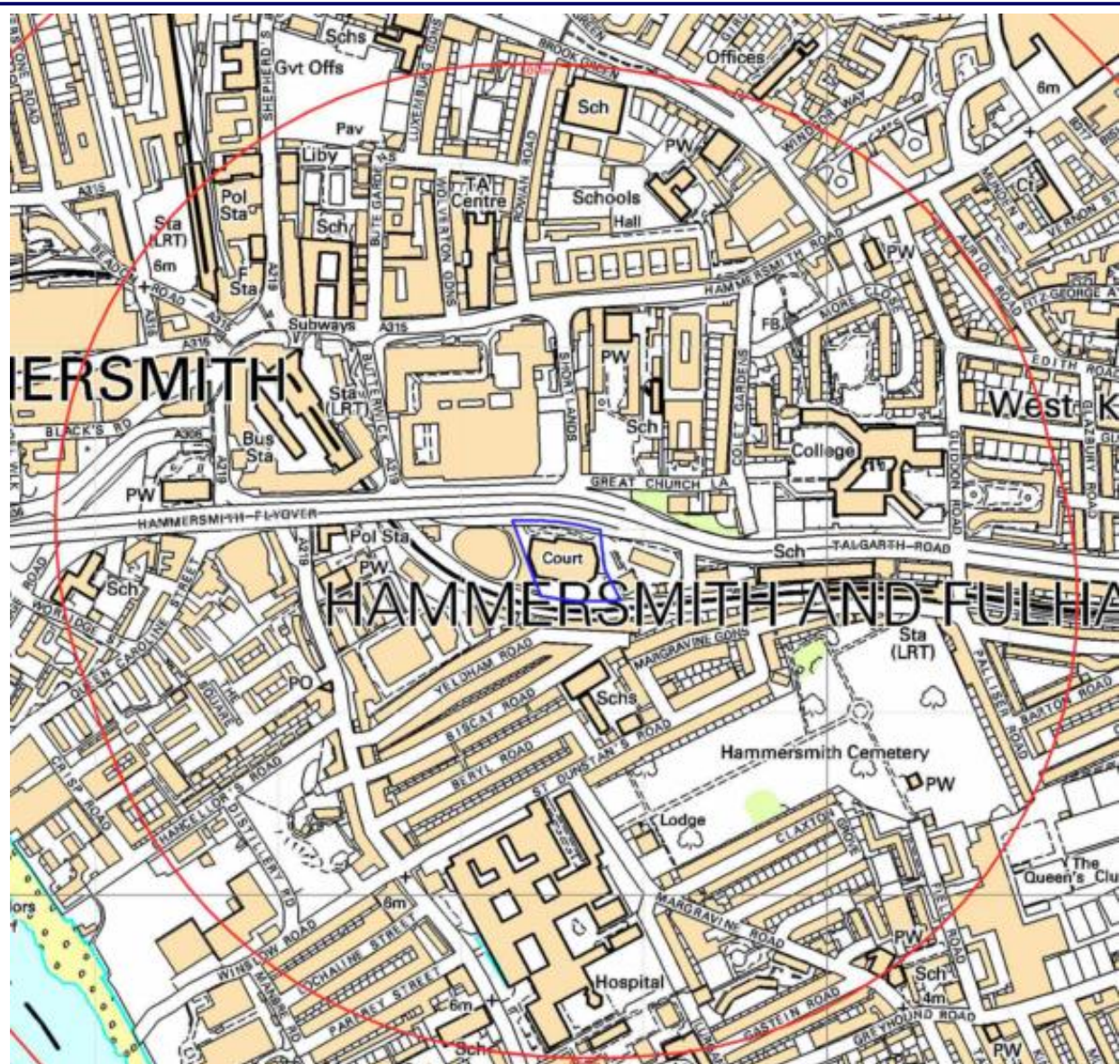
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**Figure 8:** Historical Map Extract

**Map Date:** 2002

**Scale:** Not to scale

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## **APPENDIX A**

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### General Notes

## RPS HEALTH, SAFETY & ENVIRONMENT

### *Phase 1 - Environmental Risk Assessment / Desk Study Environmental Review*

#### General Notes

1. A "desk study" means that no site visits have been carried out as any part thereof, unless otherwise specified.
2. This report provides available factual data for the site obtained only from the sources described in the text and related to the site on the basis of the location information provided by the Client.
3. The desk study information is not necessarily exhaustive and further information relevant to the site may be available from other sources.
4. The accuracy of maps cannot be guaranteed and it should be recognised that different conditions on site may have existed between and subsequent to the various map surveys.
5. No sampling or analysis has been undertaken in relation to this desk study.
6. Any borehole data from British Geological Survey sources is included on the basis that: "The British Geological Survey accept no responsibility for omissions or misinterpretation of the data from their Data Bank as this may be old or obtained from non-BGS sources and may not represent current interpretation".
7. Where any data supplied by the Client or from other sources, including that from previous site investigations, have been used it has been assumed that the information is correct. No responsibility can be accepted by RPS for inaccuracies in the data supplied by any other party.
8. This report is prepared and written in the context of an agreed scope of work and should not be used in a different context. Furthermore, new information, improved practices and changes in legislation may necessitate a re-interpretation of the report in whole or in part after its original submission.
9. The copyright in the written materials shall remain the property of the RPS Company but with a royalty-free perpetual licence to the Client deemed to be granted on payment in full to the RPS Company by the Client of the outstanding amounts.
10. The report is provided for sole use by the Client and is confidential to them, their professional advisors, no responsibility whatsoever for the contents of the report will be accepted to any person other than the Client. [Unless otherwise agreed]
11. These terms apply in addition to the RPS HSED "Standard Terms & Conditions" (or in addition to another written contract which may be in place instead thereof) unless specifically agreed in writing. (In the event of a conflict between these terms and the said Standard Terms & Conditions the said Standard Terms & Conditions shall prevail.) In the absence of such a written contract the Standard Terms & Conditions will apply.

## **RPS HEALTH, SAFETY & ENVIRONMENT**

### *Phase 2 – Site Investigations*

#### General Notes

1. The assessments made in this report are based on the ground conditions as revealed by intrusive investigations, together with the results of any field or laboratory testing or chemical analysis undertaken and other relevant data which may have been obtained including previous site investigations. In any event, ground contamination often exists as small discrete areas of contamination ("hot spots") and there can be no certainty that any or all such areas have been located and/or sampled.
2. There may be special conditions appertaining to the site which have not been taken into account in the report. The assessment may be subject to amendment in the light of additional information becoming available.
3. Where any data supplied by the Client or from other sources, including that from previous site investigations, have been used it has been assumed that the information is correct. No responsibility can be accepted by RPS Companies for inaccuracies within the data supplied by other parties.
4. Whilst the report may express an opinion on possible ground conditions between or beyond trial pit or borehole locations, or on the possible presence of features based on either visual, verbal or published evidence this is for guidance only and no liability can be accepted for the accuracy thereof.
5. Comments on groundwater conditions are based on observations made at the time of the investigation unless otherwise stated. Groundwater conditions may vary due to seasonal or other effects.
6. This report is prepared and written in the context of the agreed scope of work and should not be used in a different context. Furthermore, new information, improved practices and changes in legislation may necessitate a re-interpretation of the report in whole or part after its original submission.
7. The copyright in the written materials shall remain the property of the RPS Company but with a royalty-free perpetual licence to the client deemed to be granted on payment in full to the RPS Company by the client of the outstanding amounts.
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9. These terms apply in addition to the RPS Group "Standard Terms of Business" (or in addition to another written contract which may be in place instead thereof) unless specifically agreed in writing. (In the event of a conflict between these terms and the said Standard Terms of Business the said Standard Terms of Business shall prevail). In the absence of such a written contract the Standard Terms of Business will apply.

## APPENDIX B

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Photographs



Photo 1: Water tank on second floor of the building.



Photo 2: Electrical switch room on the second floor of the building.



Photo 3: Car park to the south of the building and waste storage area.

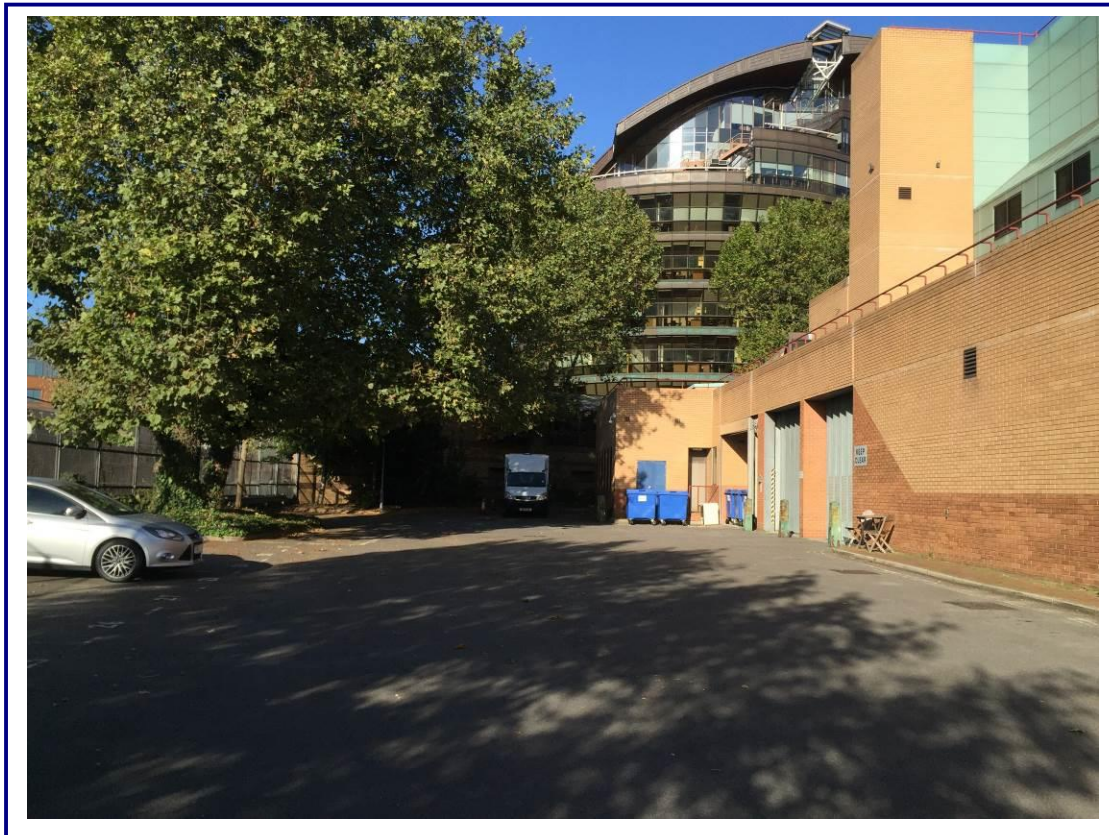


Photo 4: Air condenser outlet units were located on the roof area of the first floor.



## APPENDIX C

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### Part 2A (The Contaminated Land Regime)



## Contaminated Land Definition

Under Section 57 of the Environmental Act 1995, Part 2A was inserted into the Environmental Protection Act 1990 to include provisions for the management of contaminated land.

Subsequent regulations were first implemented in England in April 2000, Scotland in July 2000 and Wales in July 2001<sup>1</sup>, providing a definition of contaminated land and setting out the nature of liabilities that can be incurred by owners of contaminated land and groundwater.

According to the Act, contaminated land is defined as any land which appears to the local authority in whose area the land is situated to be in such a condition, by reason of substances in, on or under the land that:

- a) *significant harm* is being caused or there is a *significant possibility* of such harm being caused; or
- b) *significant pollution* of controlled waters<sup>2</sup> is being caused or there is a significant possibility of such pollution being caused<sup>3</sup>

The guidance on determining whether a particular possibility is significant is based on the principles of risk assessment and in particular on considerations of the magnitude or consequences of the different types of significant harm caused. The term *possibility of significant harm being caused* should be taken, as referring to a measure of the probability, or frequency, of the occurrence of circumstances that could lead to significant harm being caused.

The following situations are defined where harm is to be regarded as significant:

- i. Chronic or acute toxic effect, serious injury or death to humans
- ii. Irreversible or other adverse harm to the ecological system
- iii. Substantial damage to, or failure of, buildings
- iv. Disease, other physical damage or death of livestock or crops
- v. The pollution of controlled waters<sup>4</sup>.

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<sup>1</sup> In England by The Contaminated Land (England) Regulations 2000, updated by The Contaminated Land (England) (Amendment) Regulations 2012; in Scotland by The Contaminated Land (Scotland) Regulations 2000, updated by the Contaminated Land (Scotland) Regulations 2005; and in Wales by The Contaminated Land (Wales) Regulations 2001, updated by the Contaminated Land (Wales) Regulations 2006.

<sup>2</sup> In Scotland the term *controlled water* has been updated to *water environment* under the Contaminated Land (Scotland) Regulations 2005 in line with the Water Environment and Water Services (Scotland) Act 2003.

<sup>3</sup> The definition was amended in 2012 by implementation of the Water Act 2003.

<sup>4</sup> Groundwater in this context does not include waters within underground strata but above the saturated zone.

With regard to radioactivity, contaminated land is defined as any land which appears to be in such a condition, by reason of substances in, on or under the land that harm is being caused, or there is a *significant possibility of such harm being caused*<sup>5</sup>

### **The Risk Assessment Methodology**

Risk assessment is the process of collating known information on a hazard or set of hazards in order to estimate actual or potential risks to receptors. The receptor may be humans, a water resource, a sensitive local ecosystem or future construction materials. Receptors can be connected with the hazard via one or several exposure pathways (e.g. the pathway of direct contact). Risks are generally managed by isolating or removing the hazard, isolating the receptor, or by intercepting the exposure pathway. Without the three essential components of a source (hazard), pathway and receptor, there can be no risk. Thus, the mere presence of a hazard at a site does not mean that there will necessarily be attendant risks.

### **The Risk Assessment**

By considering where a viable pathway exists which connects a source with a receptor, this assessment will identify where pollutant linkages may exist. A pollutant linkage is the term used by the DEFRA in their standard procedure on risk assessment. If there is no pollutant linkage, then there is no risk. Therefore, only where a viable pollutant linkage is established does this assessment go on to consider the level of risk. Risk should be based on a consideration of both:

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

For further information please see the Contaminated Land section on the DEFRA website ([www.defra.gov.uk](http://www.defra.gov.uk)).


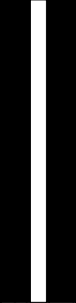


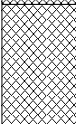
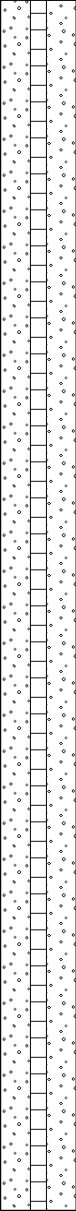

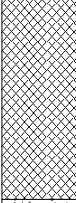
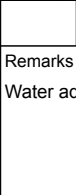
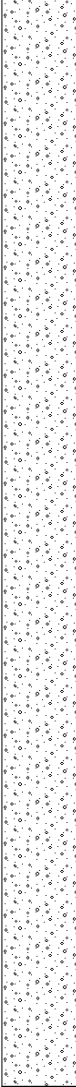


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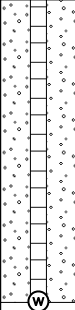
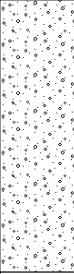

<sup>5</sup> The Radioactive Contaminated Land (Modification of Enactments) (England) Regulations 2006 and Contaminated Land (Wales) Regulations 2006.

# APPENDIX D


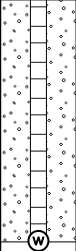
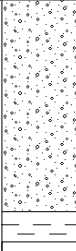

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## Exploratory Hole Logs


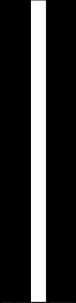
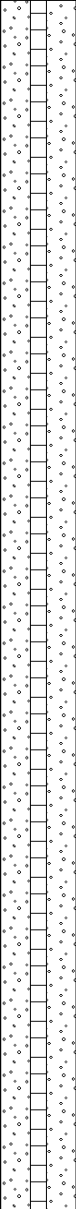


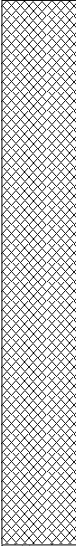
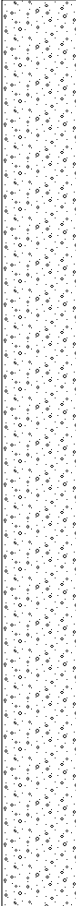

		<h1>BOREHOLE LOG</h1>						Borehole No. <b>BH1</b>				
Project Name: Hammersmith Magistrates Court		Co-ordinates:		Date(s): 28/10/2016				Sheet 1 of 2				
Project No: HLEI45310		Easting: 523728		Drilling Method:		Pipe Diameter: 50mm		Hole Type: CP				
Location: Hammersmith		Northing: 178393		Cable Percussion		Casing Diameter (mm)	Casing Depth (m)	Scale:				
Client: Jones Long LaSalle		Ground Level (mAOD): 4.42		Logged By: MH		150	5.00	1:25				
Well	Water Strike(s)	Samples & In Situ Testing			Depth (mbGL)	Thickness (m)	Level (mAOD)	Legend	Stratum Description	Scale		
		Depth (m)	Type	Results								
		0.50	ES		0.00	(0.20)	4.42		Tarmac. (TARMACADAM)			
					0.20	(0.40)	4.22		Light brown clayey sandy fine to medium subangular to rounded gravel of brick and flint. Sand is fine. (MADE GROUND)			
		1.50	ES		0.60	(0.10)	3.82		Concrete, no reinforcement. (CONCRETE)	1		
					0.70	(0.70)	3.72		Brown orange clayey fine to coarse sand with occasional fine to coarse subangular to subrounded gravel of flint, brick and concrete. (MADE GROUND)			
					1.40	(4.50)	3.02		Orange sandy fine to coarse sub angular to rounded flint GRAVEL. Sand is fine to coarse. (KEMPTON PARK GRAVEL FORMATION)	2		
										4		
Remarks						Groundwater		Chiselling				
Water added from 2.00m to 6.00m bgl to aid drilling.						Depth Strike (m)	Depth Casing (m)	Level After 20 Mins	Duration (hh:mm)		Top Depth (m)	Base Depth (m)

		<h1>BOREHOLE LOG</h1>						Borehole No. <b>BH1</b> Sheet 2 of 2				
Project Name: Hammersmith Magistrates Court		Co-ordinates:		Date(s): 28/10/2016				Hole Type:				
Project No: HLEI45310		Easting: 523728		Drilling Method:		Pipe Diameter: 50mm		CP				
Location: Hammersmith		Northing: 178393		Cable Percussion		Casing Diameter (mm)	Casing Depth (m)	Scale:				
Client: Jones Long LaSalle		Ground Level (mAOD): 4.42		Logged By: MH		150	5.00	1:25				
Well	Water Strike(s)	Samples & In Situ Testing			Depth (mbGL)	Thickness (m)	Level (mAOD)	Legend	Stratum Description	Scale		
		Depth (m)	Type	Results								
					5.90	(0.10)	-1.48		Brown grey CLAY. (LONDON CLAY FORMATION)	6		
											End of Borehole at 6.00m	
										7		
										8		
										9		
										10		
Remarks						Groundwater		Chiselling				
Water added from 2.00m to 6.00m bgl to aid drilling.						Depth Strike (m)	Depth Casing (m)	Level After 20 Mins	Duration (hh:mm)		Top Depth (m)	Base Depth (m)


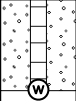

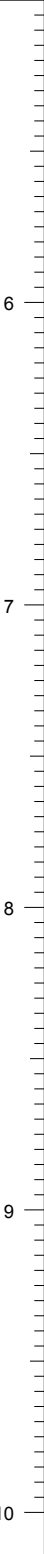



		<h1>BOREHOLE LOG</h1>						Borehole No. <b>BH2</b> Sheet 2 of 2		
Project Name: Hammersmith Magistrates Court		Co-ordinates:		Date(s): 27/10/2016 - 28/10/2016				Hole Type:		
Project No: HLEI45310		Easting: 523713		Drilling Method:		Pipe Diameter: 50mm		CP		
Location: Hammersmith		Northing: 178332		Cable Percussion		Casing Diameter (mm)	Casing Depth (m)	Scale:		
Client: Jones Long LaSalle		Ground Level (mAOD): 4.82		Logged By: MH		150	5.00	1:25		
Well	Water Strike(s)	Samples & In Situ Testing			Depth (mbGL)	Thickness (m)	Level (mAOD)	Legend	Stratum Description	Scale
		Depth (m)	Type	Results						
					5.70	(0.10)	-0.88		Brown grey CLAY. (LONDON CLAY FORMATION) End of Borehole at 5.80m	
Remarks		Groundwater		Chiselling						
Water added from 2.50m to 5.50m bgl to aid drilling.		Depth Strike (m)	Depth Casing (m)	Level After 20 Mins	Duration (hh:mm)	Top Depth (m)	Base Depth (m)			



		<h1>BOREHOLE LOG</h1>						Borehole No. <b>BH3</b> Sheet 1 of 2				
Project Name: Hammersmith Magistrates Court		Co-ordinates:		Date(s): 27/10/2016				Hole Type:				
Project No: HLEI45310		Easting: 523762		Drilling Method:		Pipe Diameter: 50mm		CP				
Location: Hammersmith		Northing: 178326		Cable Percussion		Casing Diameter (mm)	Casing Depth (m)	Scale:				
Client: Jones Long LaSalle		Ground Level (mAOD): 4.50		Logged By: MH		150	4.50	1:25				
Well	Water Strike(s)	Samples & In Situ Testing			Depth (mbGL)	Thickness (m)	Level (mAOD)	Legend	Stratum Description	Scale		
		Depth (m)	Type	Results								
		0.00			0.00	(0.20)	4.50		Tarmac. (TARMACADAM)			
		0.20			0.20	(1.80)	4.30		Light brown sandy fine to coarse angular to subrounded gravel of flint, brick and concrete. Sand is fine to coarse. (MADE GROUND)			
		1.20	ES			(1.80)				1		
		2.10	ES		2.00	(3.20)	2.50		Yellow orange sandy fine to coarse subangular to subrounded flint GRAVEL. Sand is fine to coarse. (KEMPTON PARK GRAVEL FORMATION)	2		
										3		
										4		
										5		
Continued on next sheet												
Remarks Water added from 2.50m to 5.00m bgl to aid drilling.						Groundwater			Chiselling			
						Depth Strike (m)	Depth Casing (m)	Level After 20 Mins	Duration (hh:mm)	Top Depth (m)		Base Depth (m)



		<h1>BOREHOLE LOG</h1>						Borehole No. <b>BH3</b> Sheet 2 of 2		
Project Name: Hammersmith Magistrates Court		Co-ordinates:		Date(s): 27/10/2016				Hole Type:		
Project No: HLEI45310		Easting: 523762		Drilling Method:		Pipe Diameter: 50mm		CP		
Location: Hammersmith		Northing: 178326		Cable Percussion		Casing Diameter (mm)	Casing Depth (m)	Scale:		
Client: Jones Long LaSalle		Ground Level (mAOD): 4.50		Logged By: MH		150	4.50	1:25		
Well	Water Strike(s)	Samples & In Situ Testing			Depth (mbGL)	Thickness (m)	Level (mAOD)	Legend	Stratum Description	Scale
		Depth (m)	Type	Results						
					5.20	(0.10)	-0.70		Brown grey CLAY. (LONDON CLAY FORMATION) End of Borehole at 5.30m	
Remarks		Groundwater		Chiselling						
Water added from 2.50m to 5.00m bgl to aid drilling.		Depth Strike (m)	Depth Casing (m)	Level After 20 Mins	Duration (hh:mm)	Top Depth (m)	Base Depth (m)			

**APPENDIX E**

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Field Monitoring Data

## Ground Gas Monitoring Results

Ground gas concentrations 3<sup>rd</sup> November 2016

Monitoring Well ID	Flow Rate (l/hr)		Methane (% v/v)		Carbon Dioxide (% v/v)		Oxygen (% v/v)	iVOCs (ppm)
	Peak	Steady	Peak	Steady	Peak	Steady	Steady	Peak
BH1	<0.1	<0.1	<0.1	<0.1	0.8	0.8	18.1	0.2
BH2	<0.1	<0.1	<0.1	<0.1	1.4	1.4	19.8	<0.1
BH3	<0.1	<0.1	<0.1	<0.1	1.8	1.8	18.1	<0.1

Atmospheric Pressure: 1021mb to 1020mb

## Groundwater Monitoring Results

Monitoring Well ID	Well Screen Depth (m bgl)	Strata	Depth to Groundwater (m bgl)
			03/11/2016
BH1	1.00 to 6.00	Made Ground and Kempton Park Gravel Formation	4.193
BH2	1.00 to 5.80	Made Ground and Kempton Park Gravel Formation	4.914
BH3	1.00 to 5.20	Made Ground and Kempton Park Gravel Formation	4.375

**APPENDIX F**

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Analytical Data



## Certificate of Analysis

Certificate Number 16-82620

08-Nov-16

*Client* RPS Group  
35 New Bridge Street  
London  
EC4V 6BW

*Our Reference* 16-82620

*Client Reference* HLEI 45310

*Order No* (not supplied)

*Contract Title* Hammersmith Magistrates Court

*Description* 6 Soil samples.

*Date Received* 31-Oct-16

*Date Started* 31-Oct-16

*Date Completed* 08-Nov-16

*Test Procedures* Identified by prefix DETSn (details on request).

*Notes* Opinions and interpretations are outside the scope of UKAS accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. Observations and interpretations are outside the scope of ISO 17025. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

*Approved By*

Rob Brown  
Business Manager



# Summary of Chemical Analysis

## Soil Samples

Our Ref 16-82620

Client Ref HLEI 45310

Contract Title Hammersmith Magistrates Court

Lab No	1076280	1076281	1076282	1076283	1076284	1076285
Sample ID	BH1	BH1	BH2	BH2	BH3	BH3
Depth	0.50	1.50	0.50	2.00	1.20	2.10
Other ID						
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sampling Date	28/10/16	28/10/16	28/10/16	28/10/16	27/10/16	27/10/16
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
<b>Metals</b>									
Arsenic	DETSC 2301#	0.2	mg/kg	9.5	12	11	20	8.3	14
Cadmium	DETSC 2301#	0.1	mg/kg	0.6	0.2	0.1	0.1	< 0.1	< 0.1
Chromium	DETSC 2301#	0.15	mg/kg	10	21	28	29	11	20
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	19	16	23	16	15	17
Lead	DETSC 2301#	0.3	mg/kg	59	750	22	51	32	37
Mercury	DETSC 2325#	0.05	mg/kg	0.21	< 0.05	0.06	< 0.05	0.07	0.08
Nickel	DETSC 2301#	1	mg/kg	8.1	20	24	25	10	16
Selenium	DETSC 2301#	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Zinc	DETSC 2301#	1	mg/kg	100	38	45	41	38	42
<b>Inorganics</b>									
pH	DETSC 2008#			9.1	10.1	8.0	8.0	9.1	8.6
Cyanide, Total	DETSC 2130#	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Organic matter	DETSC 2002#	0.1	%	0.6	0.9	0.5	0.1	0.4	0.5
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	94	810	460	1200	95	130
Sulphide	DETSC 2024#	10	mg/kg	32	< 10	12	< 10	< 10	< 10
<b>Petroleum Hydrocarbons</b>									
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.18
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg	0.02	0.03	0.02	0.02	0.02	0.01
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg	2.3	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg	70	9.7	< 3.4	< 3.4	< 3.4	< 3.4
Aliphatic C5-C35	DETSC 3072*	10	mg/kg	73	< 10	< 10	< 10	< 10	< 10
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg	< 0.9	10	11	7.3	5.7	5.5
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg	3.1	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg	300	< 1.4	< 1.4	< 1.4	< 1.4	< 1.4
Aromatic C5-C35	DETSC 3072*	10	mg/kg	300	10	11	< 10	< 10	< 10
TPH Ali/Aro Total	DETSC 3072*	10	mg/kg	380	20	11	< 10	< 10	< 10
Benzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Ethylbenzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Toluene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Xylene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
MTBE	DETSC 3321	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01

# Summary of Chemical Analysis

## Soil Samples

Our Ref 16-82620

Client Ref HLEI 45310

Contract Title Hammersmith Magistrates Court

Lab No	1076280	1076281	1076282	1076283	1076284	1076285
Sample ID	BH1	BH1	BH2	BH2	BH3	BH3
Depth	0.50	1.50	0.50	2.00	1.20	2.10
Other ID						
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sampling Date	28/10/16	28/10/16	28/10/16	28/10/16	27/10/16	27/10/16
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
<b>PAHs</b>									
Naphthalene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluorene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	DETSC 3301	0.1	mg/kg	0.3	< 0.1	< 0.1	< 0.1	0.2	< 0.1
Anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluoranthene	DETSC 3301	0.1	mg/kg	0.4	< 0.1	< 0.1	< 0.1	0.4	< 0.1
Pyrene	DETSC 3301	0.1	mg/kg	0.6	< 0.1	< 0.1	< 0.1	0.4	< 0.1
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	0.4	< 0.1
Chrysene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	0.2	< 0.1
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	0.2	< 0.1
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	0.2	< 0.1
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	0.3	< 0.1
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	0.2	< 0.1
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	0.1	< 0.1
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	0.2	< 0.1
PAH Total	DETSC 3301	1.6	mg/kg	< 1.6	< 1.6	< 1.6	< 1.6	2.9	< 1.6
<b>PCBs</b>									
PCB 28 + PCB 31	DETSC 3401#	0.01	mg/kg					< 0.01	
PCB 52	DETSC 3401#	0.01	mg/kg					< 0.01	
PCB 101	DETSC 3401#	0.01	mg/kg					< 0.01	
PCB 118	DETSC 3401#	0.01	mg/kg					< 0.01	
PCB 153	DETSC 3401#	0.01	mg/kg					< 0.01	
PCB 138	DETSC 3401#	0.01	mg/kg					< 0.01	
PCB 180	DETSC 3401#	0.01	mg/kg					< 0.01	
PCB 7 Total	DETSC 3401#	0.01	mg/kg					< 0.01	
<b>Phenols</b>									
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	< 0.3	< 0.3	< 0.3	0.8	< 0.3	< 0.3

## Summary of Asbestos Analysis Soil Samples

*Our Ref* 16-82620

*Client Ref* HLEI 45310

*Contract Title* Hammersmith Magistrates Court

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
1076280	BH1 0.50	SOIL	NAD	none	Andrew Little
1076281	BH1 1.50	SOIL	NAD	none	Andrew Little
1076282	BH2 0.50	SOIL	NAD	none	Andrew Little
1076284	BH3 1.20	SOIL	NAD	none	Andrew Little

Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: \* - not included in laboratory scope of accreditation.



## Information in Support of the Analytical Results

Our Ref 16-82620  
 Client Ref HLEI 45310  
 Contract Hammersmith Magistrates Court

### Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
1076280	BH1 0.50 SOIL	28/10/16	GJ 250ml, GV, PT 1L		
1076281	BH1 1.50 SOIL	28/10/16	GJ 250ml, GV, PT 1L		
1076282	BH2 0.50 SOIL	28/10/16	GJ 250ml, GV, PT 1L		
1076283	BH2 2.00 SOIL	28/10/16	GJ 250ml, GV, PT 1L		
1076284	BH3 1.20 SOIL	27/10/16	GJ 250ml, GV, PT 1L		
1076285	BH3 2.10 SOIL	27/10/16	GJ 250ml, GV, PT 1L		

Key: G-Glass P-Plastic J-Jar V-Vial T-Tub

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

### Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.

Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.

The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

### Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months



## Certificate of Analysis

Certificate Number 16-83126

10-Nov-16

*Client* RPS Group  
35 New Bridge Street  
London  
EC4V 6BW

*Our Reference* 16-83126

*Client Reference* HLEI 45310

*Order No* (not supplied)

*Contract Title* Hammersmith Magistrates Court

*Description* 3 Water samples.

*Date Received* 04-Nov-16

*Date Started* 04-Nov-16

*Date Completed* 10-Nov-16

*Test Procedures* Identified by prefix DETSn (details on request).

*Notes* Opinions and interpretations are outside the scope of UKAS accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. Observations and interpretations are outside the scope of ISO 17025. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

*Approved By*

Rob Brown  
Business Manager



# Summary of Chemical Analysis

## Water Samples

Our Ref 16-83126

Client Ref HLEI 45310

Contract Title Hammersmith Magistrates Court

Lab No	1079230	1079231	1079232
Sample ID	BH1	BH2	BH3
Depth			
Other ID			
Sample Type	WATER	WATER	WATER
Sampling Date	03/11/16	03/11/16	03/11/16
Sampling Time	n/s	n/s	n/s

Test	Method	LOD	Units			
<b>Metals</b>						
Arsenic, Dissolved	DETSC 2306	0.16	ug/l	1.8	0.32	0.29
Cadmium, Dissolved	DETSC 2306	0.03	ug/l	< 0.03	< 0.03	< 0.03
Chromium, Dissolved	DETSC 2306	0.25	ug/l	< 0.25	< 0.25	< 0.25
Chromium, Hexavalent	DETSC 2203	7	ug/l	< 7.0	< 7.0	< 7.0
Copper, Dissolved	DETSC 2306	0.4	ug/l	< 0.4	1.2	0.4
Lead, Dissolved	DETSC 2306	0.09	ug/l	< 0.09	< 0.09	< 0.09
Mercury, Dissolved	DETSC 2306	0.01	ug/l	< 0.01	< 0.01	< 0.01
Nickel, Dissolved	DETSC 2306	0.5	ug/l	0.8	1.2	1.5
Selenium, Dissolved	DETSC 2306	0.25	ug/l	2.1	3.0	1.6
Zinc, Dissolved	DETSC 2306	1.3	ug/l	4.6	19	7.8
<b>Inorganics</b>						
pH	DETSC 2008			7.6	7.4	7.7
Cyanide, Total	DETSC 2130	40	ug/l	< 40	< 40	< 40
Hardness	DETSC 2303	0.1	mg/l	257	256	210
Sulphate as SO4	DETSC 2055	0.1	mg/l	62	72	50
Sulphide	DETSC 2208	10	ug/l	< 10	< 10	11
Total Organic Carbon	DETSC 2085	1	mg/l	40	20	17
<b>Petroleum Hydrocarbons</b>						
Aliphatic C5-C6	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1
Aliphatic C6-C8	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1
Aliphatic C8-C10	DETSC 3322	0.1	ug/l	1.7	2.1	< 0.1
Aliphatic C10-C12	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0
Aliphatic C12-C16	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0
Aliphatic C16-C21	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0
Aliphatic C21-C35	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0
Aliphatic C5-C35	DETSC 3072*	10	ug/l	< 10	< 10	< 10
Aromatic C5-C7	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1
Aromatic C7-C8	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1
Aromatic C8-C10	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1
Aromatic C10-C12	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0
Aromatic C12-C16	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0
Aromatic C16-C21	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0
Aromatic C21-C35	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0
Aromatic C5-C35	DETSC 3072*	10	ug/l	< 10	< 10	< 10
TPH Ali/Aro Total	DETSC 3072*	10	ug/l	< 10	< 10	< 10
Benzene	DETSC 3322	1	ug/l	< 1.0	< 1.0	< 1.0
Toluene	DETSC 3322	1	ug/l	< 1.0	< 1.0	< 1.0
Ethylbenzene	DETSC 3322	1	ug/l	< 1.0	< 1.0	< 1.0
Xylene	DETSC 3322	1	ug/l	< 1.0	< 1.0	< 1.0
MTBE	DETSC 3322	1	ug/l	< 1.0	< 1.0	< 1.0

# Summary of Chemical Analysis

## Water Samples

Our Ref 16-83126

Client Ref HLEI 45310

Contract Title Hammersmith Magistrates Court

Lab No	1079230	1079231	1079232
Sample ID	BH1	BH2	BH3
Depth			
Other ID			
Sample Type	WATER	WATER	WATER
Sampling Date	03/11/16	03/11/16	03/11/16
Sampling Time	n/s	n/s	n/s

Test	Method	LOD	Units			
<b>PAHs</b>						
Naphthalene	DETSC 3304	0.01	ug/l	0.07	< 0.01	< 0.01
Acenaphthylene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01
Acenaphthene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01
Fluorene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01
Phenanthrene	DETSC 3304	0.01	ug/l	< 0.01	0.01	< 0.01
Anthracene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01
Fluoranthene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01
Pyrene	DETSC 3304	0.01	ug/l	0.01	0.01	< 0.01
Benzo(a)anthracene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01
Chrysene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01
Benzo(b)fluoranthene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01
Benzo(k)fluoranthene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01
Benzo(a)pyrene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01
Indeno(1,2,3-c,d)pyrene	DETSC 3304*	0.01	ug/l	< 0.01	< 0.01	< 0.01
Dibenzo(a,h)anthracene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01
Benzo(g,h,i)perylene	DETSC 3304*	0.01	ug/l	< 0.01	< 0.01	< 0.01
PAH Total	DETSC 3304	0.04	ug/l	0.08	< 0.04	< 0.04
<b>PCBs</b>						
PCB 28 + PCB 31	DETSC 3402	0.3	ug/l			< 0.3
PCB 52	DETSC 3402	0.2	ug/l			< 0.2
PCB 101	DETSC 3402	0.3	ug/l			< 0.3
PCB 118 + PCB 123	DETSC 3402	0.6	ug/l			< 0.6
PCB 138	DETSC 3402	0.2	ug/l			< 0.2
PCB 153	DETSC 3402	0.2	ug/l			< 0.2
PCB 180	DETSC 3402	0.2	ug/l			< 0.2
PCB 7 Total	DETSC 3402	1	ug/l			< 1.0
<b>Phenols</b>						
Phenol - Monohydric	DETSC 2130	100	ug/l	< 100	< 100	< 100

## Information in Support of the Analytical Results

Our Ref 16-83126  
Client Ref HLEI 45310  
Contract Hammersmith Magistrates Court

### Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
1079230	BH1 WATER	03/11/16	GB 1L, GV, PB 1L		
1079231	BH2 WATER	03/11/16	GB 1L, GV, PB 1L		
1079232	BH3 WATER	03/11/16	GB 1L, GV, PB 1L		

Key: G-Glass P-Plastic B-Bottle V-Vial

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

### Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :- Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months
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## APPENDIX G

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### Comparison of Analytical Data to Assessment Criteria



Key:

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Exceeds LOD

Exceeds S4UL (Commercial Use)

Analyte (by group)	Units	LOD	S4UL (Commercial Use)	BH1 0.50 28/10/16	BH1 1.50 28/10/16	BH2 0.50 28/10/16	BH2 2.00 28/10/16	BH3 1.20 27/10/16	BH3 2.10 27/10/16
<b>General Inorganics</b>									
Asbestos				NAD		NAD		NAD	
Asbestos Comment				na		na		na	
Asbestos Analyst				Andrew Little		Andrew Little		Andrew Little	
Asbestos Checker				Jeff Cruddas		Jeff Cruddas		Jeff Cruddas	
Arsenic	mg/kg	0.2	640	9.5	12	11	20	8.3	14
Cadmium	mg/kg	0.1	190	0.6	0.2	0.1	0.1	0.1	0.1
Chromium	mg/kg	0.15	8600	10	21	28	29	11	20
Chromium, Hexavalent	mg/kg	1	33	1	1	1	1	1	1
Copper	mg/kg	0.2	68000	19	16	23	16	15	17
Lead*	mg/kg	0.3	2300	59	750	22	51	32	37
Mercury	mg/kg	0.05	1100	0.21	0.05	0.06	0.05	0.07	0.08
Nickel	mg/kg	1	980	8.1	20	24	25	10	16
Selenium	mg/kg	0.5	12000	0.5	0.5	0.5	0.5	0.5	0.5
Zinc	mg/kg	1	730000	100	38	45	41	38	42
pH			-	9.1	10.1	8	8	9.1	8.6
Cyanide, Total	mg/kg	0.1	-	0.1	0.1	0.1	0.1	0.1	0.1
Organic matter	%	0.1	-	0.6	0.9	0.5	0.1	0.4	0.5
Sulphate Aqueous Extract as SO4	mg/l	10	-	94	810	460	1200	95	130
Sulphide	mg/kg	10	-	32	10	12	10	10	10
<b>Petroleum Hydrocarbons</b>									
Aliphatic C5-C6	mg/kg	0.01	3200	0.01	0.01	0.01	0.01	0.01	0.18
Aliphatic C6-C8	mg/kg	0.01	7800	0.02	0.03	0.02	0.02	0.02	0.01
Aliphatic C8-C10	mg/kg	0.01	2000	0.01	0.01	0.01	0.01	0.01	0.01
Aliphatic C10-C12	mg/kg	1.5	9700	1.5	1.5	1.5	1.5	1.5	1.5
Aliphatic C12-C16	mg/kg	1.2	59000	1.2	1.2	1.2	1.2	1.2	1.2
Aliphatic C16-C21	mg/kg	1.5	1600000	2.3	1.5	1.5	1.5	1.5	1.5
Aliphatic C21-C35	mg/kg	3.4	1600000	70	9.7	3.4	3.4	3.4	3.4
Aliphatic C5-C35	mg/kg	10	-	73	10	10	10	10	10
Aromatic C5-C7	mg/kg	0.01	26000	0.01	0.01	0.01	0.01	0.01	0.01
Aromatic C7-C8	mg/kg	0.01	56000	0.01	0.01	0.01	0.01	0.01	0.01
Aromatic C8-C10	mg/kg	0.01	3500	0.01	0.01	0.01	0.01	0.01	0.01
Aromatic C10-C12	mg/kg	0.9	16000	0.9	10	11	7.3	5.7	5.5
Aromatic C12-C16	mg/kg	0.5	36000	0.5	0.5	0.5	0.5	0.5	0.5
Aromatic C16-C21	mg/kg	0.6	28000	3.1	0.6	0.6	0.6	0.6	0.6
Aromatic C21-C35	mg/kg	1.4	28000	300	1.4	1.4	1.4	1.4	1.4
Aromatic C5-C35	mg/kg	10	-	300	10	11	10	10	10
TPH Ali/Aro Total	mg/kg	10	-	380	20	11	10	10	10
Benzene	mg/kg	0.01	27	0.01	0.01	0.01	0.01	0.01	0.01
Ethylbenzene	mg/kg	0.01	5700	0.01	0.01	0.01	0.01	0.01	0.01
Toluene	mg/kg	0.01	56000	0.01	0.01	0.01	0.01	0.01	0.01
Xylene	mg/kg	0.01	5900	0.01	0.01	0.01	0.01	0.01	0.01
MTBE	mg/kg	0.01	-	0.01	0.01	0.01	0.01	0.01	0.01
<b>Polycyclic Aromatic Hydrocarbons (PAH)</b>									
Naphthalene	mg/kg	0.1	190	0.1	0.1	0.1	0.1	0.1	0.1
Acenaphthylene	mg/kg	0.1	83000	0.1	0.1	0.1	0.1	0.1	0.1
Acenaphthene	mg/kg	0.1	84000	0.1	0.1	0.1	0.1	0.1	0.1
Fluorene	mg/kg	0.1	63000	0.1	0.1	0.1	0.1	0.1	0.1
Phenanthrene	mg/kg	0.1	22000	0.3	0.1	0.1	0.1	0.2	0.1
Anthracene	mg/kg	0.1	520000	0.1	0.1	0.1	0.1	0.1	0.1
Fluoranthene	mg/kg	0.1	23000	0.4	0.1	0.1	0.1	0.4	0.1
Pyrene	mg/kg	0.1	54000	0.6	0.1	0.1	0.1	0.4	0.1
Benzo(a)anthracene	mg/kg	0.1	170	0.1	0.1	0.1	0.1	0.4	0.1
Chrysene	mg/kg	0.1	350	0.1	0.1	0.1	0.1	0.2	0.1
Benzo(b)fluoranthene	mg/kg	0.1	44	0.1	0.1	0.1	0.1	0.2	0.1
Benzo(k)fluoranthene	mg/kg	0.1	1200	0.1	0.1	0.1	0.1	0.2	0.1
Benzo(a)pyrene	mg/kg	0.1	35	0.1	0.1	0.1	0.1	0.3	0.1
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	500	0.1	0.1	0.1	0.1	0.2	0.1
Dibenzo(a,h)anthracene	mg/kg	0.1	3.5	0.1	0.1	0.1	0.1	0.1	0.1
Benzo(g,h,i)perylene	mg/kg	0.1	3900	0.1	0.1	0.1	0.1	0.2	0.1
PAH Total	mg/kg	1.6	-	1.6	1.6	1.6	1.6	2.9	1.6
<b>Polychlorinated Biphenyls (PCBs)</b>									
PCB 28 + PCB 31	mg/kg	0.01	-					0.01	
PCB 52	mg/kg	0.01	-					0.01	
PCB 101	mg/kg	0.01	-					0.01	
PCB 118	mg/kg	0.01	-					0.01	
PCB 153	mg/kg	0.01	-					0.01	
PCB 138	mg/kg	0.01	-					0.01	
PCB 180	mg/kg	0.01	-					0.01	
PCB 7 Total	mg/kg	0.01	-					0.01	
Phenol - Monohydric	mg/kg	0.3	440	0.3	0.3	0.3	0.8	0.3	0.3

\* C4SL used in absence of S4UL

Key:

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Exceeds LOD

Exceeds EQS/DWS

Analyte (by group)	Units	LOD	EQS/DWS	BH1	BH2	BH3
				03/11/16	03/11/16	03/11/16
Metals						
Arsenic, Dissolved	µg/l	0.16	10	1.8	0.32	0.29
Cadmium, Dissolved	µg/l	0.03	0.25	0.03	0.03	0.03
Chromium, Dissolved	µg/l	0.25	50	0.25	0.25	0.25
General Inorganics						
Chromium, Hexavalent	µg/l	7	50	7	7	7
Copper, Dissolved	µg/l	0.4	40	0.4	1.2	0.4
Lead, Dissolved	µg/l	0.09	7.2	0.09	0.09	0.09
Mercury, Dissolved	µg/l	0.01	0.05	0.01	0.01	0.01
Nickel, Dissolved	µg/l	0.5	20	0.8	1.2	1.5
Selenium, Dissolved	µg/l	0.25	10	2.1	3	1.6
Zinc, Dissolved	µg/l	1.3	75	4.6	19	7.8
pH			-	7.6	7.4	7.7
Cyanide, Total	µg/l	40	50	40	40	40
Hardness	mg/l	0.1	-	257	256	210
Sulphide	µg/l	10	-	10	10	11
Total Organic Carbon	mg/l	1	-	40	20	17
Petroleum Hydrocarbons						
Aliphatic C5-C6	µg/l	0.1	10	0.1	0.1	0.1
Aliphatic C6-C8	µg/l	0.1	10	0.1	0.1	0.1
Aliphatic C8-C10	µg/l	0.1	10	1.7	2.1	0.1
Aliphatic C10-C12	µg/l	1	10	1	1	1
Aliphatic C12-C16	µg/l	1	10	1	1	1
Aliphatic C16-C21	µg/l	1	10	1	1	1
Aliphatic C21-C35	µg/l	1	10	1	1	1
Aliphatic C5-C35	µg/l	10	-	10	10	10
Aromatic C5-C7	µg/l	0.1	10	0.1	0.1	0.1
Aromatic C7-C8	µg/l	0.1	10	0.1	0.1	0.1
Aromatic C8-C10	µg/l	0.1	10	0.1	0.1	0.1
Aromatic C10-C12	µg/l	1	10	1	1	1
Aromatic C12-C16	µg/l	1	10	1	1	1
Aromatic C16-C21	µg/l	1	10	1	1	1
Aromatic C21-C35	µg/l	1	10	1	1	1
Aromatic C5-C35	µg/l	10	-	10	10	10
TPH Ali/Aro Total	µg/l	10	-	10	10	10
Benzene	µg/l	1	10	1	1	1
Toluene	µg/l	1	50	1	1	1
Ethylbenzene	µg/l	1	20	1	1	1
Xylene	µg/l	1	30	1	1	1
MTBE	µg/l	1	LOD	1	1	1
Polycyclic Aromatic Hydrocarbons (PAH)						
Naphthalene	µg/l	0.01	2.4	0.07	0.01	0.01
Acenaphthylene	µg/l	0.01	-	0.01	0.01	0.01
Acenaphthene	µg/l	0.01	-	0.01	0.01	0.01
Fluorene	µg/l	0.01	-	0.01	0.01	0.01
Phenanthrene	µg/l	0.01	-	0.01	0.01	0.01
Anthracene	µg/l	0.01	0.1	0.01	0.01	0.01
Fluoranthene	µg/l	0.01	0.1	0.01	0.01	0.01
Pyrene	µg/l	0.01	-	0.01	0.01	0.01
Benzo(a)anthracene	µg/l	0.01	-	0.01	0.01	0.01
Chrysene	µg/l	0.01	-	0.01	0.01	0.01
Benzo(b)fluoranthene	µg/l	0.01		0.01	0.01	0.01
Benzo(k)fluoranthene	µg/l	0.01	0.03	0.01	0.01	0.01
Benzo(a)pyrene	µg/l	0.01	0.05	0.01	0.01	0.01
Indeno(1,2,3-c,d)pyrene	µg/l	0.01		0.01	0.01	0.01
Benzo(g,h,i)perylene	µg/l	0.01	0.002	0.01	0.01	0.01
Dibenzo(a,h)anthracene	µg/l	0.01	-	0.01	0.01	0.01
PAH Total	µg/l	0.04	-	0.08	0.04	0.04
Polychlorinated Biphenyls (PCBs)						
PCB 28 + PCB 31	µg/l	0.3	LOD			0.3
PCB 52	µg/l	0.2	LOD			0.2
PCB 101	µg/l	0.3	LOD			0.3
PCB 118 + PCB 123	µg/l	0.6	LOD			0.6
PCB 138	µg/l	0.2	LOD			0.2
PCB 153	µg/l	0.2	LOD			0.2
PCB 180	µg/l	0.2	LOD			0.2
PCB 7 Total	µg/l	1	LOD			1
Phenol - Monohydric	µg/l	100	30	100	100	100