DESK STUDY & BASEMENT IMPACT ASSESSMENT REPORT

33 Priory Gardens
Highgate
London N6

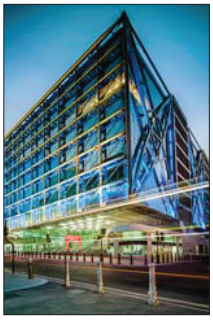
Client: Mr Paul Raspin

Engineer: Strange Associates

J16089

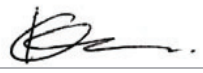
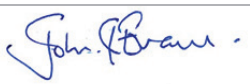
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EXECUTIVE SUMMARY

This executive summary contains an overview of the key findings and conclusions. No reliance should be placed on any part of the executive summary until the whole of the report has been read. Other sections of the report may contain information that puts into context the findings that are summarised in the executive summary.

BRIEF

This report describes the findings of a desk study carried out by Geotechnical and Environmental Associates Limited (GEA) on the instructions of Strange Associates, on behalf of Mr Paul Raspin, with respect to the construction of a new single storey extension with a single level basement to the rear of the existing house. The purpose of the work has been to establish the history of the site, to assess the geological, hydrogeological and hydrological setting and to carry out a Basement Impact Assessment (BIA) of any possible effects the proposed development may have on the local hydrogeology and hydrology and the stability of the natural and built environment. The BIA has been carried out in accordance with London Borough of Haringey's Draft Basement Development Guidance Note, dated 2012, although as this document has since been withdrawn, reference has also been made to the London Borough of Camden's BIA guidance.

SUMMARY OF DESK STUDY FINDINGS

The earliest historical map studied, dated 1864, shows the site to be undeveloped within an area of open fields and woodland and was bounded to the west by what appears to be a manor house known as The Priory. Within the rear of the grounds of the manor house, approximately 45 m to the northwest of the site, a large fish pond was present, which appears to have been fed by a stream that had its source on the northern side of Archway Road, approximately 250 m to the west / southwest of the site. From the fish pond the stream appears to have continued along the southern edge of an area of woodland, now known as Queen's Wood, and beyond in a northeasterly direction. By 1870, Highgate Station, which served the Edgware, Highgate and London Line had been constructed approximately 200 m to the west / southwest and by 1896, the areas directly to the south and southeast and 150 m to the northwest of the site had been developed with detached and semi-detached houses. By 1915, Priory Gardens had been constructed in its existing configuration with a number of terraced houses constructed on the northern side, whilst the site itself was developed with the existing house between 1935 and 1946. The site and the surrounding area have since remained essentially unchanged, although additional houses were constructed directly to the east of the site between 1952 and 1962.

SUMMARY OF BIA SCREENING STAGE

The BIA has identified the following questions carried forward to the scoping stage, which have each been assessed on the basis of the acquired desk study information.

- The proposed basement development will result in a change in the proportion of hard surfaced / paved areas
- The London Clay is the shallowest stratum at the site
- The development will result in differential founding depths with respect to adjacent foundations
- Slopes of greater than 7° are present on the site and on neighbouring sites

BIA CONCLUSIONS

On the basis of the desk study research and information acquired from nearby previous site investigations, the site is likely to be underlain by the London Clay Formation and therefore a continuous groundwater table will not exist. Significant groundwater inflows are therefore unlikely to be encountered during the basement excavation, although perched groundwater inflows may occur from any made ground and / or associated with the presence of pockets of silt and sand within the clay. Such inflows will however not be prolonged and should be suitably dealt with using conventional construction practice, usually through the use of sump pumping. The development will increase the proportion of hardstanding across the site, which will increase surface run-off; however, it is likely that any excess surface waters will not be re-directed from the current drainage route, which is likely to be to combined sewers in the road. There is nothing unusual about the proposed single level basement scheme that places it outside of standard engineering practice and design and therefore ground movements would be expected to be within normal acceptable limits. On the basis of all of the above, it is not considered that the proposed basement will have an impact on either the hydrogeological and hydrological setting or the stability of the surrounding natural and built environment.

CONTAMINATION RISK ASSESSMENT

On the basis of the findings of the research carried out, there is considered to be a LOW risk of there being any contamination linkage at this site.

Part 1: INVESTIGATION REPORT

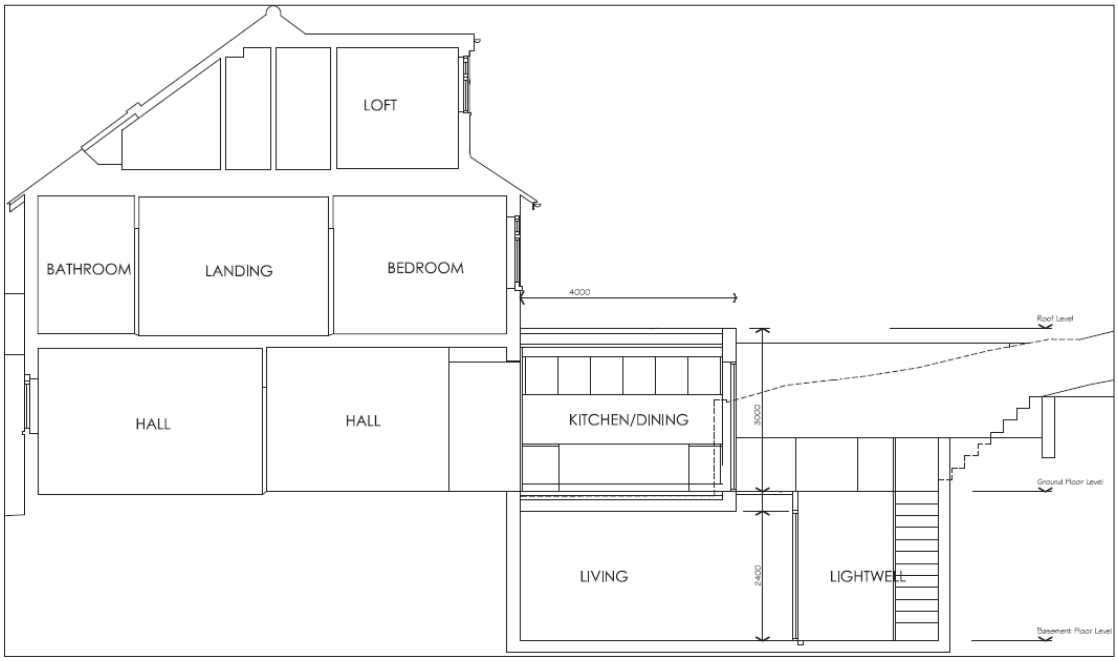
This section of the report details the objectives of the investigation, the work that has been carried out to meet these objectives and the results of the investigation.

1.0 INTRODUCTION

Geotechnical and Environmental Associates (GEA) has been commissioned by Strange Associates, on behalf of Mr Paul Raspin, to carry out a Desk Study and Basement Impact Assessment (BIA) at 33 Priory Gardens, Highgate, London, N6 5QU in support of a planning application; the site is located within the London Borough of Haringey.

A draft Basement Development Guidance Note produced by London Borough of Haringey ("the Council") dated 2012, which set out a framework for assessing the impacts of proposed basements in accordance with the Development Management Policy (DMP) 8 – 'Basements and Lightwells', has, it is understood, recently been withdrawn. However, the council still requires the planning application for this project to be accompanied by a BIA in order to assess any potential impact on the structural stability of the application building and neighbouring buildings or infrastructure, in view of the geological setting. The assessment also needs to determine, if any, the likely increase in risk of localised flooding. Therefore in the absence of current guidance, the Camden BIA policy has largely been adopted as it is now widely known and is considered to provide a robust approach to the issues of potential concern. The site is located in close proximity to the boundary between Haringey and Camden and therefore the Camden guidance is relevant to the ground conditions below the site.

1.1 Proposed Development



It is understood that it is proposed to construct a single storey rear extension which will extend a distance of 4.00 m beyond the original dwelling. The extension will include a single level basement with a lightwell extending into the rear garden. The basement is proposed to extend to a depth of 2.5 m.

This report is specific to the proposed development and the advice herein should be reviewed once the development proposals have been finalised.

1.2 Purpose of Work

The principal technical objectives of the work carried out were as follows:

- to determine the history of the site and surrounding area;
- to research the geology and hydrogeology of the site;
- to check records of data on groundwater, surface water and other publicly available environmental data;
- to use the information obtained in the above searches to carry out a qualitative risk assessment with respect to subsurface contamination; and
- to assess the possible impact of the proposed development on the local hydrogeology, hydrology and stability of surrounding structures in support of a basement planning application.

1.3 Scope of Work

In order to meet the above objectives, a desk study was carried out comprising, in summary, the following activities:

- a review of readily available geological maps;
- a review of publicly available environmental data sourced from the Landmark Envirocheck database;
- a review of historical Ordnance Survey (OS) maps supplied by Landmark; and
- provision of a report presenting and interpreting the above data, together with our advice and recommendations with respect to the proposed development.

1.3.1 Basement Impact Assessment

The work carried out includes a Hydrological and Hydrogeological Assessment and Land Stability Assessment (also referred to as Slope Stability Assessment), all of which form part of the BIA procedure specified in the London Borough of Camden (LBC) Planning Guidance CPG4[1] and their Guidance for Subterranean Development[2] prepared by Arup (the "Arup report"). The aim of the work is to provide information on surface water, groundwater and land stability and in particular to assess whether the development will affect neighbouring properties or groundwater movements and whether any identified impacts can be appropriately mitigated by the design of the development.

1.3.2 Qualifications

The land stability element of the Basement Impact Assessment (BIA) has been carried out by Martin Cooper, a BEng in Civil Engineering, a chartered engineer (CEng), member of the Institution of Civil Engineers (MICE), and Fellow of the Geological Society of London (FGS) who has over 20 years' specialist experience in ground engineering. The subterranean (groundwater) flow assessment has been carried out by John Evans, MSc in Hydrogeology,

1 London Borough of Camden Planning Guidance CPG4 *Basements and lightwells*
2 Ove Arup & Partners (2010) *Camden geological, hydrogeological and hydrological study. Guidance for Subterranean Development.* For London Borough of Camden November 2010

Chartered Geologist (CGeol) and Fellow of the Geological Society of London (FGS). The surface water and flooding assessment has been carried out by Rupert Evans, a hydrologist with more than ten years consultancy experience in flood risk assessment, surface water drainage schemes and hydrology / hydraulic modelling. Rupert Evans is a Chartered Environmentalist, Chartered Water and Environmental Manager and a Member of CIWEM.

The assessments have been made in conjunction with Steve Branch, a BSc in Engineering Geology and Geotechnics, MSc in Geotechnical Engineering, a chartered geologist (CGeol) and Fellow of the Geological Society (FGS) with over 25 years' experience in geotechnical engineering and engineering geology.

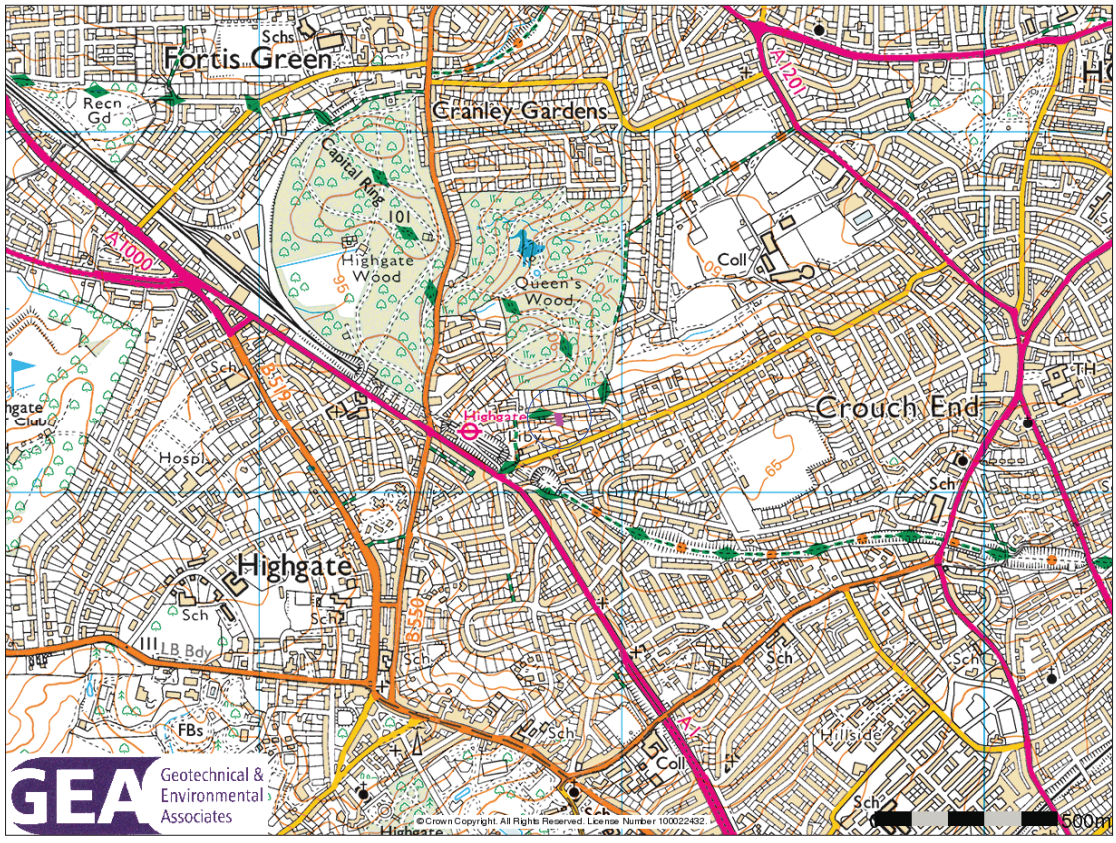
All assessors meet the qualification requirements of the Council guidance.

1.4 Limitations

The conclusions and recommendations made in this report are limited to those that can be made on the basis of the research carried out. The results of the research should be viewed in the context of the work that has been carried out and no liability can be accepted for matters outside the stated scope of the research. Any comments made on the basis of information obtained from third parties are given in good faith on the assumption that the information is accurate. No independent validation of third party information has been made by GEA.

2.0 THE SITE

2.1 Site Description



The site is located in Highgate, north London, approximately 250 m to the northeast of Highgate London Underground station and approximately 1.5 km northwest of Archway London Underground station. It fronts onto Priory Gardens to the north and is bordered to the west by the adjoining No 35 Priory Gardens, to the east by No 31 Priory Gardens and to the south by the rear gardens of terraced houses fronting onto Shepherds Hill. It may be additionally located by National Grid Reference 528830, 188210, as shown on the map on the previous page.

A walkover of the site was carried out on the 9th May 2016 by a geotechnical engineer from GEA. The site covers a roughly rectangular area with maximum dimensions of approximately 10 m east-west by 40 m north-south and is occupied by No 33 Priory Gardens, a two-storey semi-detached house with loft accommodation. The topography of the surrounding area slopes up to the south and southwest from the northeast at approximately 15°, and the house, which occupies the front of the site to the north, has been constructed on this slope, such that it is approximately 4.50 m above street level. It is accessed by a series of steps up from street level and has planted bedding on either side containing shrubs, bushes and semi-mature trees, generally less than 4 m in height. The front of the property, between street level and the top of the stairs, forms a slope of approximately 25°. A tree is also present at the front of the property at street level, and is approximately 6 m in height.

A patio area is located immediately to the rear of the property and steps lead up to the remainder of the rear garden which is approximately 1.7 m higher than the ground level of the house. This area slopes up towards the north at approximately 11° and is bordered with planted flowerbeds and a variety of trees of up 5 m in height. There are mature trees of up to 20 m in height along the southern site boundary.

No potential sources of contamination have been identified on the site or within the immediate surrounding area.

2.2 Site History

The site history has been researched by reference to online data and historical OS maps obtained from the Landmark database.

At the time of the earliest historical map studied, dated 1864, the site was undeveloped within an area of open fields and woodland and was bounded to the west by what appears to be a manor house known as The Priory. Within the rear of the grounds of the manor house, approximately 45 m to the northwest of the site, a large fish pond was present, which appears to have been fed by a stream that had its source on the northern side of Archway Road, approximately 250 m to the west / southwest of the site. From the fish pond the stream appears to have continued along the southern edge of an area of woodland, now known as Queens Wood, and beyond in a northeasterly direction. By 1870, Highgate Station, which served the Edgware, Highgate and London Line had been constructed approximately 200 m to the west / southwest and by 1896, the areas directly to the south and southeast and 150 m to the northwest of the site had been developed with detached and semi-detached houses.

By 1915, the former manor house had been demolished and Priory Gardens constructed in its existing configuration with a number of terraced houses constructed on the northern side in the area of the former fish pond, which had presumably been infilled. The former stream feeding into the pond is also not shown on dated after 1915. The site itself remained undeveloped until some time between 1935 and 1946 when the existing house was constructed, although further housing was constructed along Priory Gardens and to the south

of the site along Shepherds Hill, prior to that time. The site and the surrounding area have since remained essentially unchanged, although additional houses were constructed directly to the east of the site between 1952 and 1962.

2.3 Other Information

A search of public registers and databases has been made via the Envirocheck database and relevant extracts from the search are appended. Full results of the search can be provided if required.

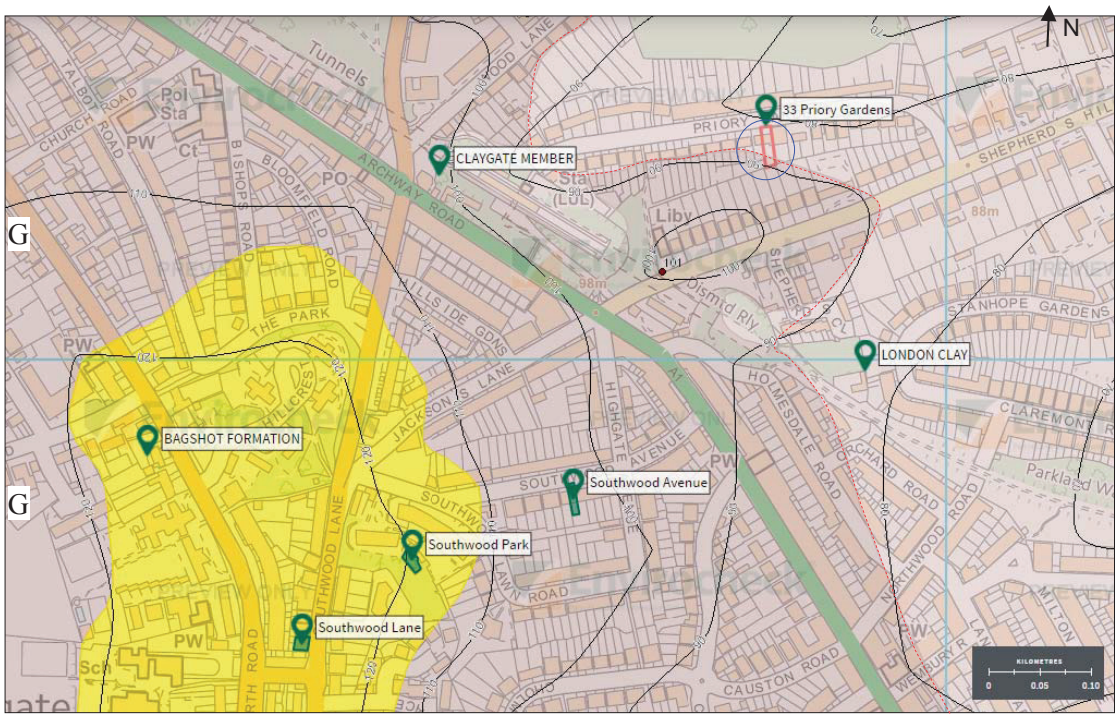
The Envirocheck report has indicated no existing or historical landfill sites, waste management or waste transfer sites located within 1 km of the site. Additionally, there have been no pollution incidents to controlled waters within 1 km of the site and there are no registered contaminated land sites within 1 km.

Reference to records compiled by the Health Protection Agency (formerly the National Radiological Protection Board) indicates that the site falls within an area where less than 1% of homes are affected by radon emissions and therefore radon protective measures will not be necessary.

Information on the properties surrounding the site has been gathered from the Local Authority planning portal, which has suggested that none of properties surrounding the site are likely to include basements. No information has been obtained with respect to other basements nearby.

2.4 Geology

The British Geological Survey (BGS) map of the area (sheet 256) indicates that the site is directly underlain by the London Clay Formation, although the boundary of the Claygate Member crosses over towards the southern part of the site, as shown by the digital geological map extract below.



According to the British Geological Society memoir, the Claygate Member comprises alternating beds of clayey silt, very silty clay, sandy silt and glauconitic silty fine sand and the London Clay Formation is described as bioturbated or poorly laminated, blue-grey or grey-brown, slightly calcareous, silty to very silty clay, clayey silt and sometimes silt, with some layers of sandy clay.

The geology in this area is generally horizontally bedded such that the boundary between the geological formations roughly follows the ground surface contour lines, as can be seen on the geological extract map. This has been generally confirmed by a number of previous GEA investigations carried out in the surrounding area, a number of which are shown on the above map. These investigations proved the respective boundaries between the Bagshot Formation and Claygate member and the Claygate Member and London Clay Formation, with the boundary between the Claygate Member and the London Clay expected to be between 90 m OD and 85 m OD.

2.5 Hydrology and Hydrogeology

The Claygate Member is classified as a Secondary 'A' Aquifer, meaning it has permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases form an important source of base flow to rivers as defined by the Environment Agency (EA). The London Clay Formation is classified as an Unproductive Stratum, referring to rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow.

Spring lines can be present at the boundary between the Claygate Member and the underlying, essentially impermeable London Clay. These springs have been the source of a number of London's "lost" rivers, notably the Fleet, Westbourne and Tyburn, which all rose on Hampstead Heath. Reference to Appendix 3 of the Haringey Draft Basement Policy indicates that Priory Brook, a tributary of the River Moselle, had its source on the northern side of Archway Road, approximately 250 m to the west / southwest of the site, which fed into a large pond approximately 45 m to the northwest of the site. The stream appears to have flowed in a northeasterly direction along the southern edge of Queens Wood before heading towards Hornsey where it combined with a number of other tributaries to form the River Moselle. This former river course is also shown on historical mapping, as discussed in Section 2.2 of this report.

Any groundwater flow within the London Clay will be at a very slow rate, due to its negligible permeability. The permeability will be predominantly secondary, through fissures in the clay. Published data indicates the horizontal permeability of the London Clay to generally range between 1 x 10^{-11} m/s and 1 x 10^{-9} m/s, with an even lower vertical permeability. Vertical permeability within the Claygate Member is also likely to be slow in view of the presence of layers of clay, but horizontal permeability is likely to be one or two orders of magnitude higher. Any water infiltrating the London Clay will generally tend to flow vertically downwards at a very slow rate towards the chalk aquifer.

The nearest surface water feature is a drainage feature located in Queens Wood, approximately 360 m to the northwest of the site. The site is therefore not located in an area at risk of flooding from rivers or sea, as defined by the EA. Surface water flooding maps published by the EA also indicate that the site is not located in an area at risk from surface water flooding up to a 1 in 1000 year storm event. The site is covered in a mixture or hardstanding and soft landscaping, such that infiltration of rainwater into the ground beneath the site is limited to isolated areas of soft landscaping towards the south of the site. The majority of surface runoff is therefore likely to drain into combined sewers.

3.0 SCREENING ASSESSMENT

A number of screening tools are included in the Arup document and for the purposes of this report reference has been made to Appendices E1, E2 and E3 which include a series of questions within screening flowcharts for surface flow and flooding, subterranean (groundwater) flow and land stability. The flowchart questions and responses to these questions are tabulated below.

3.1. Subterranean (groundwater) Screening Assessment

Question	Response for 33 Priory Gardens
1a. Is the site located directly above an aquifer?	No. The Site is underlain by the London Clay, which is designated as Unproductive Strata by the Environment Agency and cannot store or transmit water in sufficient quantities to support groundwater abstractions or watercourses. The site however located close to the boundary with the overlying Claygate Member, which is a designated Secondary 'A' Aquifer.
1b. Will the proposed basement extend beneath the water table surface?	Unlikely as the London Clay cannot support groundwater flow and therefore cannot support a water table.
2. Is the site within 100 m of a watercourse, well (used/ disused) or potential spring line?	No
3. Is the site within the catchment of the pond chains on Hampstead Heath?	No. Figure 14 of the Arup report confirms that the site is not located within this catchment area.
4. Will the proposed basement development result in a change in the proportion of hard surfaced / paved areas?	*Yes. The new extension and basement lightwell will extend into the rear garden.*
5. As part of the site drainage, will more surface water (e.g. rainfall and run-off) than at present be discharged to the ground (e.g. via soakaways and/or SUDS)?	Unlikely, given that the site is underlain by clay soils and is unlikely to be suitable for a soakaway or similar SUDS based system and therefore site drainage will be directed to public sewer.
6. Is the lowest point of the proposed excavation (allowing for any drainage and foundation space under the basement floor) close to or lower than, the mean water level in any local pond or spring line?	No.

The above assessment has identified the following potential issues that need to be assessed:

Q4 The proposed basement development will result in a change in the proportion of hard surfaced / paved areas.

3.2 Stability Screening Assessment

Question	Response for 33 Priory Gardens
1. Does the existing site include slopes, natural or manmade, greater than 7°?	*Yes. The topographical contours of the area confirms that the site is located in an area of slopes greater than 7°.*
2. Will the proposed re-profiling of landscaping at the site change slopes at the property boundary to more than 7°?	No. See appended existing and proposed cross-sections.
3. Does the development neighbour land, including railway cuttings and the like, with a slope greater than 7°?	*Yes. The topographical contours of the area confirms that the site is located in an area of slopes greater than 7°.*
4. Is the site within a wider hillside setting in which the general slope is greater than 7°?	*Yes. The contours of the area shown on the topographical map indicate that there is a general slope of the area greater than 7°. However, the Envirocheck report indicates that the site is not located in an area considered to have a landslide potential.*

Question	Response for 33 Priory Gardens
5. Is the London Clay the shallowest strata at the site?	*Yes*
6. Will any trees be felled as part of the proposed development and / or are any works proposed within any tree protection zones where trees are to be retained?	No
7. Is there a history of seasonal shrink-swell subsidence in the local area and / or evidence of such effects at the site?	*Yes. The area is prone to these effects as a result of the presence of shrinkable clay soils, such as London Clay.*
8. Is the site within 100 m of a watercourse or potential spring line?	No
9. Is the site within an area of previously worked ground?	No.
10. Is the site within an aquifer?	No. The site is underlain by the London Clay, which is designated as Unproductive Strata by the Environment Agency and cannot store and transmit usable amounts of water.
11. Is the site within 50 m of Hampstead Heath ponds?	No.
12. Is the site within 5 m of a highway or pedestrian right of way?	No
13. Will the proposed basement significantly increase the differential depth of foundations relative to neighbouring properties?	*Yes. The proposed basement will extend the foundations of the southern party wall with No 35 Priory Gardens, which will result in a differential founding depth with the other foundations of that property.*
14. Is the site over (or within the exclusion zone of) any tunnels, e.g. railway lines?	No.

The above assessment has identified the following potential issues that need to be assessed:

Q1 Although terraced, the rear garden forms a slope of approximately 11°
Q3 Neighbouring properties include a similar slope angle and profile within the rear gardens.
Q4 The site within a wider hillside setting in which the general slope is greater than 7°
Q5 The London Clay is the shallowest stratum at the site.
Q7 The site is in an area likely to be affected by seasonal shrink-swell.
Q13 The founding depth of the proposed basement will be lower than the neighbouring No 35 Priory Gardens.

3.3 Surface Flow and Flooding Screening Assessment

Question	Response for 33 Priory Gardens
1. Is the site within the catchment of the pond chains on Hampstead Heath?	No. The Arup report confirms that the site is not located within this catchment area.
2. As part of the proposed site drainage, will surface water flows (e.g. volume of rainfall and peak run-off) be materially changed from the existing route?	No. The basement will be below the footprint of the proposed extension and therefore, the existing drainage regime will not change. The basement will be beneath the proposed extension, therefore the 1m distance between the roof of the basement and ground surface as recommended by the Arup report and para 2.16 of the CPG4 does not apply.
3. Will the proposed basement development result in a change in the proportion of hard surfaced / paved areas?	*Yes. There will be an increase in impermeable area across the ground surface above the basement. The basement will be beneath the proposed extension and extend beyond the existing garden.*

Question	Response for 33 Priory Gardens
4. Will the proposed basement development result in changes to the profile of the inflows (instantaneous and long term) of surface water being received by adjacent properties or downstream watercourses?	No. Although the basement will be below the footprint of the proposed extension and extend out beyond the rear garden, the existing drainage regime will remain the same and flow into combined sewers.
5. Will the proposed basement result in changes to the quality of surface water being received by adjacent properties or downstream watercourses?	No. The proposals are very unlikely to result in any changes to the quality of surface water being received by adjacent properties or downstream watercourses as the surface water drainage regime will be unchanged.
6. Is the site in an area identified to have surface water flood risk according to either the Local Flood Risk Management Strategy or the Strategic Flood Risk Assessment or is it at risk of flooding, for example because the proposed basement is below the static water level of nearby surface water feature?	No. The findings of this BIA together with the Haringey SFRA and Environment Agency online flood maps show that there will be a very low risk from surface water flooding and low flood risk from sewers and reservoirs (and other artificial sources), and fluvial/tidal watercourses. In accordance with paragraph 5.11 of the CPG a positive pumped device will be installed in the basement in order to further protect the site from sewer flooding.

The above assessment has identified the following potential issues that need to be assessed:

Q3 The proposed basement development will result in a change in the proportion of hard surfaced / paved areas

4.0 SCOPING ASSESSMENT

The purpose of scoping is to assess in more detail the factors to be investigated in the impact assessment. Potential impacts are assessed for each of the identified potential impact factors.

4.1 Potential Impacts

The following potential impacts have been identified by the BIA screening process.

Potential Impact	Consequence
The proposed basement development will result in a change in the proportion of hard surfaced / paved areas	The basement will be beneath the proposed extension and extend beyond the existing garden; therefore, there will be an increase in impermeable area across the ground surface above the basement. This may increase the surface water
The London Clay the shallowest strata at the site	The London Clay is prone to seasonal shrink-swell (subsidence and heave).
Seasonal shrink-swell can result in foundation movements.	Multiple potential impacts depending on the specific setting of the basement development. For example, in terraced properties, the implications of a deepened basement/foundation system on neighbouring properties should be considered
The development will increase the differential founding depth of adjacent foundations	Having differential founding depths can result in differential settlements, which could arise from seasonal shrink and swell, as underlain by clay soils, or as result of the increase foundations stiffness of underpinned foundations relative to those that remain unchanged.
The site contains slopes of greater than 7˚.	Slopes greater than 8° to 10° within the London Clay Formation may be prone to slope failure unless adequately retained. Should slope failure occur, it may give rise to the damage of nearby property and infrastructure.

Potential Impact	Consequence
The site neighbours land that include slopes of greater than 7˚.	It should be noted that, whilst the boundary of the site as indicated on Figure 17 falls close to an area of landslide potential, there is no evidence of slope movement within the general area or within the site itself. Furthermore, the Envirocheck report indicates that the site is not located in an area considered landslide potential.
The site within a wider hillside setting in which the general slope is greater than 7°	

These potential impacts have been assessed further below in Section 5.0 on the basis of the geological and hydrogeological setting of the site.

5.0 BASEMENT IMPACT ASSESSMENT

The screening has identified a number of potential impacts. The desk study information, including the results of nearby site investigations, has been used below to review the potential impacts, to assess the likelihood of them occurring and the scope for reasonable engineering mitigation

The proposed basement development will result in a change in the proportion of hard surfaced / paved areas

The development will increase the proportion of hardstanding across the site and so there will be an increase in surface run-off. If adequate drainage is therefore not installed to intercept and dispose of the increased run-off, it can lead to surface water ponding on the site, with the possibility of surface water flow being diverted into neighbouring sites. However, any surface waters will not be re-directed from the current drainage routes, which is likely to be to combined sewers in the road.

The London Clay the shallowest stratum at the site and seasonal shrink-swell

The presence of the London Clay can give rise to a number of potential issues with regard to excavation and construction of a new basement structure. These include slope instability on existing and new slopes greater than 7º, heave of the clay soils associated with the unloading from the basement excavation and shrinking and swelling of the clay soils due to the removal of trees. The site is well vegetated and the design of new foundations will need to take account of the shrinkability of the clay soils and the distance from the existing trees. However, as the new extension includes a single level basement, new foundations are likely to be placed at a sufficient depth such that they will not to be affected by future shrinking and swelling associated with tree growth.

In addition, although the depth of the proposed basement will give rise to unloading of the clay and therefore heave movements and pressures, these heave movements are unlikely to be significant as they will, to a certain extent, be restricted by the continued pressure applied by the loads of the existing house, which is to be retained. Furthermore, there is nothing abnormal about the proposed basement development and there are well-established engineering solutions to mitigate heave movements, including void formers below the slab and the use of tension piles if necessary. Therefore, it is not considered likely that the excavation of the proposed basement will have a deleterious impact on the existing building or on surrounding structures, provided that normal design and construction measures are taken to mitigate the impact.

Differential founding depths

The southern wall of the proposed basement forms the party wall with No 35 Priory Gardens. The foundation to this wall will be underpinned in order to form the basement retaining wall and therefore will be at a greater depth than the remaining foundations of No 35. As stated above, provided that the new foundations are suitably designed using standard engineering practice, there is no reason that the underpinning of the party wall should result in excessive differential settlements. However, highly shrinkable clay soils underlie the site and as a result seasonal shrink and swell will affect the foundations. Should the design of retaining walls and foundations not take into account the configuration and bearing stratum of adjacent foundations, it may lead to the structural damage of associated structures.

It would be recommended that a trial pitting exercise is carried out to confirm the configuration of the foundations to inform the final design and it is likely that a programme of monitoring will be required during the groundwork to monitor ground movements associated with the underpinning and excavation, as part of party wall agreements. It is anticipated that these matters can be dealt with by way of conditions on the planning consent.

The site is located in an area of slopes greater than 7°

The site currently contains a slope which has a general angle that is greater than 7˚ in the south and is within a wider hillside setting in which the general slope is greater than 7˚. The basement is to extend to a depth of about 2.5 m and is to be extended into the rear garden.

The rear garden forms a slope of approximately 11° and lies on the London Clay Formation. Previous research has indicated the London Clay has generally been found to be stable in the long-term at angles of between 8° and 10°. Slopes greater than this therefore may be prone to slope failure unless adequately retained. Should slope failure occur, it may give rise to the damage of nearby property and infrastructure. The proposed excavation shows that the basement and lightwell will extend into the rear garden and the new slope angle will be approximately 9°.

The investigation has not highlighted any issues that give rise to concerns regarding the effectiveness of these normal engineering solutions at this particular site. However, as part of the site is within an area as having a slope angle of greater than 7° it would be prudent to carry out a simple slope stability assessment once the proposals are finalised.

6.0 CONTAMINATION RISK ASSESSMENT

It is proposed to redevelop the site through the excavation and construction of a single level basement below the footprint of the existing house.

6.1 Environmental Risks

Part IIA of the Environmental Protection Act 1990, which was inserted into that Act by Section 57 of the Environment Act 1995, provides the main regulatory regime for the identification and remediation of contaminated land. As part of the new regime local authorities are required to carry out inspections of their area to identify sites that may be contaminated. The determination of contaminated sites is based on a "suitable for use" approach which involves managing the risks posed by contaminated land by making risk-based decisions. This risk assessment is carried out on the basis of establishing one or more "pollution linkages"; a pollution linkage requires a source of contamination, a sensitive target or receptor that is at risk from the contamination and a pathway by which the contamination can travel from the source to the target.

A risk assessment should be carried out for consideration by the Local Planning Authority (LPA) before the planning application is determined. Where unacceptable risks are identified proposals will need to be made to address these risks as part of the development process. The guidance recognises the benefits of a phased approach and the desk study is the first phase in the process of investigating and identifying contamination to assist in the determination of a planning application.

6.1.1 Source

The site was first developed by 1935 with the existing terraced house and since this time it has remained essentially unchanged. No potential on site sources of contamination have therefore been identified, with the site only ever having a residential usage. Furthermore, the immediate surrounding area has also been predominantly residential and has remained essentially unchanged since the first half of the 20th Century. No off-site sources of contamination have been identified, including any historical or existing landfill sites within 1 km of the site and therefore there is not a risk to the site from migrating landfill gas.

6.1.2 Receptor

The continued use of the site for a residential end use represents a relatively high sensitivity end-use and end users are therefore considered to be potential sensitive receptors. As the site is underlain the London Clay Formation, which is designated an Unproductive Stratum, groundwater and adjacent sites are considered to be a low sensitive receptors, in addition to the deep chalk aquifer. Ground workers and new buried services during the construction phase are likely to come into contact with any contaminants present within the soils through which they pass and new buried concrete as part of the basement construction would also be considered to be a possible receptor.

6.1.3 Pathway

Within the site, end users will be generally isolated from direct contact with any contaminants present within the near surface soils by the presence of the building and the surrounding areas of hardstanding. Although the rear of the proposed building will continue to be used as a private garden that will include areas of soft landscaping, which will act as a potential pathway between end users and the underlying soils via direct contact. Due to the presence of

negligibly permeable London Clay beneath the site, there is not considered to be a pathway with neighbouring site or to the major aquifer. It is also considered to be negligible risk of soluble contaminants being present on the site.

The groundwork and construction period will form a pathway by which buried services may be exposed to any contaminants present within the soil through direct contact and site workers may come into contact with the soils.

There is thus considered to be a generally limited potential for a significant contaminant pathway to be present between any potential contaminant source and a target for the particular contaminant.

6.1.4 Preliminary Risk Appraisal

On the basis of the above and the findings of the previous investigations, it is considered that following the redevelopment of this site, there will be a LOW RISK of being a significant contaminant linkage, which would result in a requirement for any remediation work.

7.0 CONCLUSIONS

From the desk study research and the information acquired from nearby previous site investigations, the site is likely to be underlain by the London Clay Formation and therefore a continuous groundwater table will not exist. Significant groundwater inflows are therefore unlikely to be encountered during the basement excavation, although perched groundwater inflows may occur from any made ground and / or associated with the presence of pockets of silt and sand within the clay. Such inflows should however not be prolonged and should be suitably dealt with using conventional construction practice, usually through the use of sump pumping. The development will increase the proportion of hardstanding across the site and so there will be an increase in surface run-off, however any surface waters will not be re-directed from the current drainage routes, which is likely to be to combined sewers in the road.

There is nothing unusual about the proposed single level basement scheme that falls outside of standard engineering practice and design and therefore ground movements would be expected to remain within normal acceptable limits, which from previous experience, would not lead to unacceptable damage to neighbouring properties On the basis of all of the above, it is not considered that the proposed basement will have an impact on either the hydrogeological and hydrological setting or the stability of the surrounding natural and built environment.

On the basis of the findings of the research carried out there is considered to be a LOW risk of there being a significant contamination linkage at this site, such that there should not be any requirement for remediation of contaminated soils.

APPENDIX

Envirocheck Extracts

Historical Maps

Risk Assessment Description

Risk Assessment Classification

Site Plan

Envirocheck® Report:

Datasheet

Order Details:

Order Number:
86009190_1_1

Customer Reference:
J16089

National Grid Reference:
528830, 188210

Slice:
A

Site Area (Ha):
0.04

Search Buffer (m):
1000

Site Details:

33 Priory Gardens
LONDON
N6 5QU

Client Details:

Mr S Branch
GEA Ltd
Widbury Barn
Widbury Hill
Ware
Herts
SG12 7QE

Geotechnical & Environmental Associates

Contents

Report Section	Page Number
Summary	-
Agency & Hydrological	1
Waste	3
Hazardous Substances	-
Geological	5
Industrial Land Use	9
Sensitive Land Use	20
Data Currency	21
Data Suppliers	28
Useful Contacts	29

Introduction

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

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

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Report Version v50.0

Data Type	Page Number	On Site	0 to 250m	251 to 500m	501 to 1000m (*up to 2000m)
Agency & Hydrological					
BGS Groundwater Flooding Susceptibility	pg 1	Yes			n/a
Contaminated Land Register Entries and Notices					
Discharge Consents	pg 1				2
Prosecutions Relating to Controlled Waters			n/a	n/a	n/a
Enforcement and Prohibition Notices					
Integrated Pollution Controls					
Integrated Pollution Prevention And Control					
Local Authority Integrated Pollution Prevention And Control					
Local Authority Pollution Prevention and Controls	pg 1			2	4
Local Authority Pollution Prevention and Control Enforcements					
Nearest Surface Water Feature	pg 2			Yes	
Pollution Incidents to Controlled Waters					
Prosecutions Relating to Authorised Processes					
Registered Radioactive Substances					
River Quality					
River Quality Biology Sampling Points					
River Quality Chemistry Sampling Points					
Substantiated Pollution Incident Register					
Water Abstractions					
Water Industry Act Referrals					
Groundwater Vulnerability	pg 2	Yes	n/a	n/a	n/a
Drift Deposits			n/a	n/a	n/a
Bedrock Aquifer Designations	pg 2	Yes	n/a	n/a	n/a
Superficial Aquifer Designations			n/a	n/a	n/a
Source Protection Zones					
Extreme Flooding from Rivers or Sea without Defences				n/a	n/a
Flooding from Rivers or Sea without Defences				n/a	n/a
Areas Benefiting from Flood Defences				n/a	n/a
Flood Water Storage Areas				n/a	n/a
Flood Defences				n/a	n/a
Detailed River Network Lines					n/a
Detailed River Network Offline Drainage	pg 2			Yes	n/a

Summary

Data Type	Page Number	On Site	0 to 250m	251 to 500m	501 to 1000m (*up to 2000m)
Waste					
BGS Recorded Landfill Sites					
Historical Landfill Sites					
Integrated Pollution Control Registered Waste Sites					
Licensed Waste Management Facilities (Landfill Boundaries)					
Licensed Waste Management Facilities (Locations)					
Local Authority Landfill Coverage		1	n/a	n/a	n/a
Local Authority Recorded Landfill Sites					
Potentially Infilled Land (Non-Water)	pg 3			2	
Potentially Infilled Land (Water)	pg 3		1	3	14
Registered Landfill Sites					
Registered Waste Transfer Sites					
Registered Waste Treatment or Disposal Sites					
Hazardous Substances					
Control of Major Accident Hazards Sites (COMAH)					
Explosive Sites					
Notification of Installations Handling Hazardous Substances (NIHHS)					
Planning Hazardous Substance Consents					
Planning Hazardous Substance Enforcements					

GEA Geotechnical & Environmental Associates

Summary

Data Type	Page Number	On Site	0 to 250m	251 to 500m	501 to 1000m (*up to 2000m)
Geological					
BGS 1:625,000 Solid Geology	pg 5	Yes	n/a	n/a	n/a
BGS Estimated Soil Chemistry					
BGS Recorded Mineral Sites					
BGS Urban Soil Chemistry	pg 5		Yes	Yes	Yes
BGS Urban Soil Chemistry Averages	pg 7	Yes			
Brine Compensation Area			n/a	n/a	n/a
Coal Mining Affected Areas			n/a	n/a	n/a
Mining Instability			n/a	n/a	n/a
Man-Made Mining Cavities					
Natural Cavities					
Non Coal Mining Areas of Great Britain				n/a	n/a
Potential for Collapsible Ground Stability Hazards	pg 7	Yes		n/a	n/a
Potential for Compressible Ground Stability Hazards				n/a	n/a
Potential for Ground Dissolution Stability Hazards				n/a	n/a
Potential for Landslide Ground Stability Hazards	pg 7	Yes	Yes	n/a	n/a
Potential for Running Sand Ground Stability Hazards	pg 7	Yes		n/a	n/a
Potential for Shrinking or Swelling Clay Ground Stability Hazards	pg 7	Yes		n/a	n/a
Radon Potential - Radon Affected Areas			n/a	n/a	n/a
Radon Potential - Radon Protection Measures			n/a	n/a	n/a
Industrial Land Use					
Contemporary Trade Directory Entries	pg 9		2	39	47
Fuel Station Entries	pg 16				3
Points of Interest - Commercial Services	pg 16			6	9
Points of Interest - Education and Health	pg 17				1
Points of Interest - Manufacturing and Production	pg 18		1	2	3
Points of Interest - Public Infrastructure	pg 18			1	8
Points of Interest - Recreational and Environmental	pg 19		1		3
Gas Pipelines					
Underground Electrical Cables					

Data Type	Page Number	On Site	0 to 250m	251 to 500m	501 to 1000m (*up to 2000m)
Sensitive Land Use					
Ancient Woodland	pg 20		1	1	
Areas of Adopted Green Belt					
Areas of Unadopted Green Belt					
Areas of Outstanding Natural Beauty					
Environmentally Sensitive Areas					
Forest Parks					
Local Nature Reserves	pg 20		2		
Marine Nature Reserves					
National Nature Reserves					
National Parks					
Nitrate Sensitive Areas					
Nitrate Vulnerable Zones					
Ramsar Sites					
Sites of Special Scientific Interest					
Special Areas of Conservation					
Special Protection Areas					
World Heritage Sites					

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A13SW (S)	0	2	528827 188200
1	**Discharge Consents** Operator: London Underground Ltd. Property Type: Railways Location: Highgate Railway Depot, Woodside Avenue, London N6 Authority: Environment Agency, Thames Region Catchment Area: Not Supplied Reference: Ctwc.2296 Permit Version: 2 Effective Date: 9th December 2005 Issued Date: 9th December 2005 Revocation Date: 9th December 2017 Discharge Type: Sewage Discharges - Final/Treated Effluent - Not Water Company Discharge Environment: Into Land Receiving Water: Made Ground/London Clay **Status:** **Transferred from COPA 1974** Positional Accuracy: Located by supplier to within 10m	A17SW (NW)	942	3	527990 188670
1	**Discharge Consents** Operator: London Underground Ltd. Property Type: Railways Location: Highgate Railway Depot, Woodside Avenue, London N6 Authority: Environment Agency, Thames Region Catchment Area: Not Given Reference: CTWC.2296 Permit Version: 1 Effective Date: 21st March 1988 Issued Date: 21st March 1988 Revocation Date: 8th December 2006 Discharge Type: Sewage Discharges - Final/Treated Effluent - Not Water Company Discharge Environment: Irrigation Area Receiving Water: Made Ground/London Clay **Status:** **Transferred from COPA 1974** Positional Accuracy: Located by supplier to within 100m	A17SW (NW)	942	3	527990 188670
2	**Local Authority Pollution Prevention and Controls** Name: Prestige Dry Cleaners Location: 289 Archway Road, London, N6 5aa Authority: London Borough of Haringey, Planning and Environmental Health Permit Reference: DC39 Dated: Not Supplied Process Type: Local Authority Pollution Prevention and Control Description: PG6/46 Dry cleaning **Status:** **Permitted** Positional Accuracy: Manually positioned to the address or location	A13SW (SW)	267	4	528581 188078
3	**Local Authority Pollution Prevention and Controls** Name: Highgate Dry Cleaners & Laundry Location: 246 Archway Road, Highgate, London, N6 5ax Authority: London Borough of Haringey, Planning and Environmental Health Permit Reference: DC59 Dated: Not Supplied Process Type: Local Authority Pollution Prevention and Control Description: PG6/46 Dry cleaning **Status:** **Permitted** Positional Accuracy: Manually positioned to the address or location	A8NE (S)	349	4	528857 187839
4	**Local Authority Pollution Prevention and Controls** Name: Archway Dry Cleaners Location: 194 Archway Road, London, N6 5bb Authority: London Borough of Haringey, Planning and Environmental Health Permit Reference: DC05 Dated: Not Supplied Process Type: Local Authority Pollution Prevention and Control Description: PG6/46 Dry cleaning **Status:** **Permitted** Positional Accuracy: Manually positioned to the address or location	A8NE (S)	543	4	528968 187662
5	**Local Authority Pollution Prevention and Controls** Name: John Nichol Service Station Location: 31-33 North Road, LONDON, N6 4BE Authority: London Borough of Haringey, Planning and Environmental Health Permit Reference: PV-11 Dated: 17th April 2001 Process Type: Local Authority Air Pollution Control Description: PG1/14 Petrol filling station **Status:** **Authorised** Positional Accuracy: Manually positioned to the address or location	A7NE (SW)	782	4	528296 187611

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
6	**Local Authority Pollution Prevention and Controls** Name: First Choice Location: 5 Highgate High Street, London, N6 5jr Authority: London Borough of Camden, Pollution Projects Team Permit Reference: PPC/DC3 Dated: 12th January 2007 Process Type: Local Authority Pollution Prevention and Control Description: PG6/46 Dry cleaning **Status: Permitted** Positional Accuracy: Located by supplier to within 10m	A8SW (S)	886	5	528575 187336
7	**Local Authority Pollution Prevention and Controls** Name: Wellington Service Station Location: 513 Archwwy Road, LONDON, N6 4HX Authority: London Borough of Haringey, Planning and Environmental Health Permit Reference: PV-02/v1 Dated: 17th April 2001 Process Type: Local Authority Air Pollution Control Description: PG1/14 Petrol filling station **Status: Authorised** Positional Accuracy: Manually positioned to the address or location	A12NW (W)	958	4	527908 188517
	Nearest Surface Water Feature	A13NW (NW)	359	-	528647 188539
	Groundwater Vulnerability Soil Classification: Not classified Map Sheet: Sheet 39 West London Scale: 1:100,000	A13NW (W)	0	3	528827 188206
	Drift Deposits None				
	Bedrock Aquifer Designations Aquifer Designation: Secondary Aquifer - A	A13SW (S)	0	2	528825 188197
	Bedrock Aquifer Designations Aquifer Designation: Unproductive Strata	A13NW (W)	0	2	528827 188206
	Superficial Aquifer Designations No Data Available				
	Extreme Flooding from Rivers or Sea without Defences None				
	Flooding from Rivers or Sea without Defences None				
	Areas Benefiting from Flood Defences None				
	Flood Water Storage Areas None				
	Flood Defences None				
	Detailed River Network Lines None				
8	**Detailed River Network Offline Drainage** River Type: Tertiary River Hydrographic Area: D006	A13NW (NW)	359	3	528647 188539
9	**Detailed River Network Offline Drainage** River Type: Tertiary River Hydrographic Area: D006	A18SE (N)	479	3	528843 188705
10	**Detailed River Network Offline Drainage** River Type: Tertiary River Hydrographic Area: D006	A18SW (N)	495	3	528780 188718

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	Local Authority Landfill Coverage Name: London Borough of Haringey - Has supplied landfill data		0	6	528827 188206
	Local Authority Landfill Coverage Name: London Borough of Islington - Has no landfill data to supply		816	7	529386 187588
	Local Authority Landfill Coverage Name: London Borough of Camden - Has no landfill data to supply		867	8	528572 187357
11	**Potentially Infilled Land (Non-Water)** Bearing Ref: SE Use: Unknown Filled Ground (Pit, quarry etc) Date of Mapping: 1996	A8NE (SE)	447	-	529027 187786
12	**Potentially Infilled Land (Non-Water)** Bearing Ref: S Use: Unknown Filled Ground (Pit, quarry etc) Date of Mapping: 1996	A8NW (S)	489	-	528688 187716
13	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1896	A13NW (W)	127	-	528695 188243
14	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1896	A13NW (NW)	319	-	528539 188374
15	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1946	A13SW (SW)	352	-	528517 188016
16	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1951	A14NW (NE)	449	-	529213 188460
17	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1876	A12NE (W)	536	-	528285 188233
18	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1876	A8NE (SE)	560	-	529101 187696
19	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1946	A7NE (SW)	601	-	528481 187693
20	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1876	A8SW (S)	663	-	528808 187523
21	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1876	A14SW (E)	683	-	529490 187997
22	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1876	A8SW (S)	700	-	528758 187489
23	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1876	A8SW (S)	713	-	528761 187476
24	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1876	A12SW (W)	718	-	528148 187951
25	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1876	A8SE (S)	729	-	528848 187458
26	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1876	A14SE (E)	768	-	529587 188040
27	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1876	A14SE (E)	851	-	529679 188084

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
28	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1896	A12NW (W)	866	-	527955 188265
29	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1876	A7NW (SW)	917	-	528057 187685
30	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1876	A14SE (E)	933	-	529767 188146

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	BGS 1:625,000 Solid Geology Description: Thames Group	A13NW (W)	0	2	528827 188206
	BGS Estimated Soil Chemistry No data available				
	BGS Measured Urban Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Grid: 528758, 188313 Soil Sample Type: Topsoil Sample Area: London Arsenic Measured Concentration: 23.90 mg/kg Cadmium Measured Concentration: 0.50 mg/kg Chromium Measured Concentration: 99.50 mg/kg Lead Measured Concentration: 206.30 mg/kg Nickel Measured Concentration: 22.90 mg/kg	A13NW (NW)	108	2	528758 188313
	BGS Measured Urban Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Grid: 529275, 188132 Soil Sample Type: Topsoil Sample Area: London Arsenic Measured Concentration: 17.40 mg/kg Cadmium Measured Concentration: 0.60 mg/kg Chromium Measured Concentration: 77.30 mg/kg Lead Measured Concentration: 1787.40 mg/kg Nickel Measured Concentration: 38.00 mg/kg	A14SW (E)	444	2	529275 188132
	BGS Measured Urban Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Grid: 528776, 187704 Soil Sample Type: Topsoil Sample Area: London Arsenic Measured Concentration: 16.00 mg/kg Cadmium Measured Concentration: 1.00 mg/kg Chromium Measured Concentration: 74.90 mg/kg Lead Measured Concentration: 262.90 mg/kg Nickel Measured Concentration: 27.00 mg/kg	A8NW (S)	485	2	528776 187704
	BGS Measured Urban Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Grid: 528792, 188773 Soil Sample Type: Topsoil Sample Area: London Arsenic Measured Concentration: 20.60 mg/kg Cadmium Measured Concentration: 0.50 mg/kg Chromium Measured Concentration: 120.80 mg/kg Lead Measured Concentration: 267.70 mg/kg Nickel Measured Concentration: 27.00 mg/kg	A18SW (N)	549	2	528792 188773

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	BGS Urban Soil Chemistry Averages Source: British Geological Survey, National Geoscience Information Service Sample Area: London Count Id: 7209 Arsenic Minimum Concentration: 1.00 mg/kg Arsenic Average Concentration: 17.00 mg/kg Arsenic Maximum Concentration: 161.00 mg/kg Cadmium Minimum Concentration: 0.10 mg/kg Cadmium Average Concentration: 0.90 mg/kg Cadmium Maximum Concentration: 165.20 mg/kg Chromium Minimum Concentration: 13.00 mg/kg Chromium Average Concentration: 79.00 mg/kg Chromium Maximum Concentration: 2094.00 mg/kg Lead Minimum Concentration: 11.00 mg/kg Lead Average Concentration: 280.00 mg/kg Lead Maximum Concentration: 10000.00 mg/kg Nickel Minimum Concentration: 2.00 mg/kg Nickel Average Concentration: 28.00 mg/kg Nickel Maximum Concentration: 506.00 mg/kg	A13NW (W)	0	2	528827 188206
	Coal Mining Affected Areas In an area that might not be affected by coal mining				
	Non Coal Mining Areas of Great Britain No Hazard				
	Potential for Collapsible Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13NW (W)	0	2	528827 188206
	Potential for Compressible Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13NW (W)	0	2	528827 188206
	Potential for Ground Dissolution Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13NW (W)	0	2	528827 188206
	Potential for Landslide Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13NW (W)	0	2	528827 188206
	Potential for Landslide Ground Stability Hazards Hazard Potential: Low Source: British Geological Survey, National Geoscience Information Service	A13NE (N)	39	2	528829 188264
	Potential for Landslide Ground Stability Hazards Hazard Potential: Low Source: British Geological Survey, National Geoscience Information Service	A13SW (SW)	45	2	528780 188186
	Potential for Running Sand Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13NW (W)	0	2	528827 188206
	Potential for Running Sand Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13SW (S)	0	2	528825 188197
	Potential for Shrinking or Swelling Clay Ground Stability Hazards Hazard Potential: Moderate Source: British Geological Survey, National Geoscience Information Service	A13NW (W)	0	2	528827 188206
	Radon Potential - Radon Affected Areas Affected Area: The property is in a lower probability radon area, as less than 1% of homes are above the action level Source: British Geological Survey, National Geoscience Information Service	A13NW (W)	0	2	528827 188206

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	Radon Potential - Radon Protection Measures Protection Measure: No radon protective measures are necessary in the construction of new dwellings or extensions Source: British Geological Survey, National Geoscience Information Service	A13NW (W)	0	2	528827 188206

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
31	**Contemporary Trade Directory Entries** Name: Stork Sak Location: 45, Priory Gardens, London, N6 5QU Classification: Bags, Belts & Accessories - Manufacturers & Suppliers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A13SW (W)	45	-	528778 188204
32	**Contemporary Trade Directory Entries** Name: Artisans Libres Location: 292, Archway Road, London, N6 5AU Classification: Furniture - Repairing & Restoring **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A13SW (S)	230	-	528778 187961
33	**Contemporary Trade Directory Entries** Name: Sophie Levene Location: 5, Jacksons Lane, London, N6 5SR Classification: Antiques - Repairing & Restoring **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A13SW (SW)	260	-	528637 188007
34	**Contemporary Trade Directory Entries** Name: Archway Exhaust & Tyres Location: 274, Archway Road, London, N6 5AU Classification: Tyre Dealers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A13SW (S)	266	-	528814 187920
34	**Contemporary Trade Directory Entries** Name: Mr Clutch Location: 260-268, Archway Road, London, N6 5AX Classification: Brake & Clutch Service Centres **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A13SE (S)	309	-	528830 187877
34	**Contemporary Trade Directory Entries** Name: Mr Clutch Location: 260-268, Archway Road, London, N6 5AX Classification: Brake & Clutch Service Centres **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A13SE (S)	309	-	528830 187877
34	**Contemporary Trade Directory Entries** Name: Lavengro Print Centre Ltd Location: 252, Archway Road, London, N6 5AX Classification: Printers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A8NE (S)	335	-	528849 187852
34	**Contemporary Trade Directory Entries** Name: Capital Home Help Location: Flat 1, 223, Archway Road, London, N6 5BN Classification: Cleaning Services - Domestic **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A8NW (S)	335	-	528793 187853
34	**Contemporary Trade Directory Entries** Name: Nssb Location: 246, Archway Road, London, N6 5AX Classification: Dry Cleaners **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A8NE (S)	350	-	528857 187838
35	**Contemporary Trade Directory Entries** Name: Prestige Dry Cleaners Uk Ltd Location: 289, Archway Road, LONDON, N6 5AA Classification: Dry Cleaners **Status: Active** Positional Accuracy: Automatically positioned to the address	A13SW (SW)	268	-	528580 188078
35	**Contemporary Trade Directory Entries** Name: Stantons Location: 297, Archway Road, London, N6 5AA Classification: Cleaning Materials & Equipment **Status: Active** Positional Accuracy: Automatically positioned to the address	A13SW (SW)	274	-	528572 188083
35	**Contemporary Trade Directory Entries** Name: British Spirals & Casting Location: 305, Archway Road, LONDON, N6 5AA Classification: Ornamental Metalwork **Status: Active** Positional Accuracy: Automatically positioned to the address	A13SW (SW)	281	-	528562 188088

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
70	**Contemporary Trade Directory Entries** Name: The Paper Conservation Studio Ltd Location: 80, Archway Road, London, N19 3TT Classification: Art Restoration & Picture Cleaning **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A9SW (S)	946	-	529192 187313
71	**Contemporary Trade Directory Entries** Name: Esso Location: 513, Archway Road, London, N6 4HX Classification: Petrol Filling Stations **Status: Active** Positional Accuracy: Automatically positioned to the address	A12NW (W)	962	-	527905 188520
72	**Contemporary Trade Directory Entries** Name: Martin Wess Location: 10, Ellington Road, London, N10 3DG Classification: Fireplaces & Mantelpieces **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A18NW (N)	966	-	528768 189189
73	**Contemporary Trade Directory Entries** Name: Sunnyside Service Station Location: 87, Sunnyside Road, London, N19 3SL Classification: Mot Testing Centres **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A9NE (SE)	984	-	529705 187730
74	**Fuel Station Entries** Name: John Nichol Cars Location: 31-33 North Road, Highgate, London, Greater London, N6 4BE Brand: Total Premises Type: Petrol Station **Status: Open** Positional Accuracy: Manually positioned to the address or location	A7NE (SW)	772	-	528305 187616
75	**Fuel Station Entries** Name: Mrh Wellington Location: 513, Archway Road, London, N6 4HX Brand: ESSO Premises Type: Petrol Station **Status: Open** Positional Accuracy: Manually positioned to the address or location	A12NW (W)	962	-	527905 188520
76	**Fuel Station Entries** Name: Sunnyside Service Station Location: 87 Sunnyside Road, Crouch End, LONDON, N19 3SL Brand: Obsolete Premises Type: Not Applicable **Status: Obsolete** Positional Accuracy: Automatically positioned to the address	A9NE (SE)	983	-	529704 187730
77	**Points of Interest - Commercial Services** Name: Tilleys London Castings Location: 305 Archway Road, London, N6 5AA Category: Construction Services Class Code: Metalworkers Including Blacksmiths Positional Accuracy: Positioned to address or location	A13SW (SW)	281	9	528562 188088
77	**Points of Interest - Commercial Services** Name: British Spirals & Casting Location: 305 Archway Road, London, N6 5AA Category: Construction Services Class Code: Metalworkers Including Blacksmiths Positional Accuracy: Positioned to address or location	A13SW (SW)	281	9	528562 188088
78	**Points of Interest - Commercial Services** Name: Mr Clutch Location: 260-268 Archway Road, London, N6 5AX Category: Repair and Servicing Class Code: Vehicle Repair, Testing and Servicing Positional Accuracy: Positioned to address or location	A13SE (S)	309	9	528830 187877
78	**Points of Interest - Commercial Services** Name: Mr Clutch Location: 260-268 Archway Road, London, N6 5AX Category: Repair and Servicing Class Code: Vehicle Repair, Testing and Servicing Positional Accuracy: Positioned to address or location	A13SE (S)	309	9	528830 187877

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
85	**Points of Interest - Manufacturing and Production** Name: Tank Location: N6 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A13SW (W)	209	9	528618 188165
86	**Points of Interest - Manufacturing and Production** Name: Works Location: Not Supplied Category: Industrial Features Class Code: Unspecified Works Or Factories Positional Accuracy: Positioned to an adjacent address or location	A13NW (NW)	355	9	528542 188445
86	**Points of Interest - Manufacturing and Production** Name: Works Location: N6 Category: Industrial Features Class Code: Unspecified Works Or Factories Positional Accuracy: Positioned to an adjacent address or location	A13NW (NW)	359	9	528537 188444
87	**Points of Interest - Manufacturing and Production** Name: Tank Location: N6 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A12SE (W)	633	9	528195 188124
88	**Points of Interest - Manufacturing and Production** Name: Tank Location: N6 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A12NW (W)	718	9	528103 188220
89	**Points of Interest - Manufacturing and Production** Name: Works Location: Not Supplied Category: Industrial Features Class Code: Unspecified Works Or Factories Positional Accuracy: Positioned to an adjacent address or location	A7SE (SW)	985	9	528305 187350
90	**Points of Interest - Public Infrastructure** Name: M K Londyn Waste Location: 242a Archway Road, London, N6 5AX Category: Infrastructure and Facilities Class Code: Waste Storage, Processing and Disposal Positional Accuracy: Positioned to address or location	A8NE (S)	357	9	528863 187831
91	**Points of Interest - Public Infrastructure** Name: Police Station Location: Outside Police Station Archway Road, Highgate, London, N6 4ER Category: Central and Local Government Class Code: Police Stations Positional Accuracy: Positioned to address or location	A12NE (W)	540	9	528282 188268
91	**Points of Interest - Public Infrastructure** Name: Highgate Police Station Location: Highgate Police Station 407, Archway Road, London, N6 4NW Category: Central and Local Government Class Code: Police Stations Positional Accuracy: Positioned to address or location	A12NE (W)	540	9	528282 188269
92	**Points of Interest - Public Infrastructure** Name: John Nichol Cars Location: 31-33 North Road, Highgate, London, N6 4BE Category: Road And Rail Class Code: Petrol and Fuel Stations Positional Accuracy: Positioned to address or location	A7NE (SW)	772	9	528305 187616
92	**Points of Interest - Public Infrastructure** Name: John Nichol (Cars) Ltd Location: 33 North Road, London, N6 4BE Category: Road And Rail Class Code: Petrol and Fuel Stations Positional Accuracy: Positioned to address or location	A7NE (SW)	778	9	528292 187620
93	**Points of Interest - Public Infrastructure** Name: A Man with a Van Highgate Location: 47 Highgate High Street, London, N6 5JX Category: Infrastructure and Facilities Class Code: Waste Storage, Processing and Disposal Positional Accuracy: Positioned to address or location	A7SE (SW)	899	9	528408 187390

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
94	**Points of Interest - Public Infrastructure** Name: Esso Location: 513 Archway Road, London, N6 4HX Category: Road And Rail Class Code: Petrol and Fuel Stations Positional Accuracy: Positioned to address or location	A12NW (W)	962	9	527905 188520
94	**Points of Interest - Public Infrastructure** Name: Wellington Service Station Location: 513 Archway Road, London, N6 4HX Category: Road And Rail Class Code: Petrol and Fuel Stations Positional Accuracy: Positioned to address or location	A12NW (W)	962	9	527905 188520
94	**Points of Interest - Public Infrastructure** Name: Wellington Service Station Location: 513 Archway Road, London, N6 4HX Category: Road And Rail Class Code: Petrol and Fuel Stations Positional Accuracy: Positioned to address or location	A12NW (W)	962	9	527905 188520
95	**Points of Interest - Recreational and Environmental** Name: Playground Location: Not Supplied Category: Recreational Class Code: Playgrounds Positional Accuracy: Positioned to an adjacent address or location	A13SE (S)	189	9	528886 188007
96	**Points of Interest - Recreational and Environmental** Name: Playground Location: Not Supplied Category: Recreational Class Code: Playgrounds Positional Accuracy: Positioned to an adjacent address or location	A12NE (W)	598	9	528252 188411
96	**Points of Interest - Recreational and Environmental** Name: Playground Location: Archway Road, N6 Category: Recreational Class Code: Playgrounds Positional Accuracy: Positioned to an adjacent address or location	A12NE (W)	598	9	528252 188411
97	**Points of Interest - Recreational and Environmental** Name: Play Area Location: Not Supplied Category: Recreational Class Code: Playgrounds Positional Accuracy: Positioned to an adjacent address or location	A9NE (SE)	905	9	529567 187658

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
98	**Ancient Woodland** Name: Queens Wood Reference: 1495754 Area(m²): 208705.63 Type: Ancient and Semi-Natural Woodland	A13NE (N)	63	10	528836 188288
99	**Ancient Woodland** Name: Queens Wood Reference: 1495755 Area(m²): 245788.87 Type: Ancient and Semi-Natural Woodland	A12NE (W)	364	10	528457 188244
100	**Local Nature Reserves** Name: Queens Wood Multiple Area: N Area (m2): 210717.38 Source: Natural England Designation Date: 28th March 2012	A13NE (N)	63	10	528836 188288
101	**Local Nature Reserves** Name: Parkland Walk Multiple Area: Y Area (m2): 143103.6 Source: Natural England Designation Date: 28th March 2012	A13SW (S)	91	10	528806 188097

Useful Contacts

Contact	Name and Address	Contact Details
2	**British Geological Survey - Enquiry Service** British Geological Survey, Kingsley Dunham Centre, Keyworth, Nottingham, Nottinghamshire, NG12 5GG	Telephone: 0115 936 3143 Fax: 0115 936 3276 Email: enquiries@bgs.ac.uk Website: www.bgs.ac.uk
3	**Environment Agency - National Customer Contact Centre (NCCC)** PO Box 544, Templeborough, Rotherham, S60 1BY	Telephone: 03708 506 506 Email: enquiries@environment-agency.gov.uk
4	**London Borough of Haringey - Planning and Environmental Health** 639 High Road, Tottenham, London, N17 8BD	Telephone: 0208 489 5183 Fax: 0208 489 5117 Website: www.haringey.gov.uk
5	**London Borough of Camden - Pollution Projects Team** Seventh Floor, Town Hall Extension, Argyle Street, London, WC1H 8EQ	Telephone: 020 7278 4444 Fax: 020 7860 5713 Website: www.camden.gov.uk
6	**London Borough of Haringey - Planning Department** Civic Centre, 639 High Road, Tottenham, London, N17 8BD	Website: www.haringey.gov.uk
7	**London Borough of Islington - Environmental Health Department** 159 Upper Street, Islington, London, N1 1RE	Telephone: 020 7527 2000 Fax: 020 7477 3057 Website: www.islington.gov.uk
8	**London Borough of Camden** Town Hall, Judd Street, London, WC1H 9JE	Telephone: 020 7974 4444 Fax: 020 7974 6866 Email: info@camden.gov.uk Website: www.camden.gov.uk
9	**PointX** 7 Abbey Court, Eagle Way, Sowton, Exeter, Devon, EX2 7HY	Website: www.pointx.co.uk
10	**Natural England** County Hall, Spetchley Road, Worcester, WR5 2NP	Telephone: 0300 060 3900 Email: enquiries@naturalengland.org.uk Website: www.naturalengland.org.uk
11	**Environment Agency - Head Office** Rio House, Waterside Drive, Aztec West, Almondsbury, Bristol, Avon, BS32 4UD	Telephone: 01454 624400 Fax: 01454 624409
-	**Public Health England - Radon Survey, Centre for Radiation, Chemical and Environmental Hazards** Chilton, Didcot, Oxfordshire, OX11 0RQ	Telephone: 01235 822622 Fax: 01235 833891 Email: radon@phe.gov.uk Website: www.ukradon.org
-	**Landmark Information Group Limited** Imperium, Imperial Way, Reading, Berkshire, RG2 0TD	Telephone: 0844 844 9952 Fax: 0844 844 9951 Email: customerservices@landmarkinfo.co.uk Website: www.landmarkinfo.co.uk

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

Geology 1:50,000 Maps Legends

Artificial Ground and Landslip

Map Colour	Lex Code	Rock Name	Rock Type	Min and Max Age
	WGR	Worked Ground (Undivided)	Void	Holocene - Holocene
	MGR	Made Ground (Undivided)	Artificial Deposit	Holocene - Holocene
	LSGR	Landscaped Ground (Undivided)	Artificially Modified Ground	Holocene - Holocene

Superficial Geology

Map Colour	Lex Code	Rock Name	Rock Type	Min and Max Age
	LOFT	Lowestoft Formation	Diamicton	Anglian - Anglian
	DHGR	Dollis Hill Gravel Member	Sand and Gravel	Anglian - Cromerian

Bedrock and Faults

Map Colour	Lex Code	Rock Name	Rock Type	Min and Max Age
	CLGB	Claygate Member	Clay, Silt and Sand	Eocene - Eocene
	LC	London Clay Formation	Clay, Silt and Sand	Eocene - Eocene
	BGS	Bagshot Formation	Sand	Eocene - Eocene

GEA Geotechnical & Environmental Associates

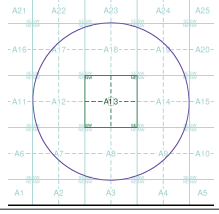
Geology 1:50,000 Maps

This report contains geological map extracts taken from the BGS Digital Geological map of Great Britain at 1:50,000 scale and is designed for users carrying out preliminary site assessments who require geological maps for the area around the site. This mapping may be more up to date than previously published paper maps.
The various geological layers - artificial and landslip deposits, superficial geology and solid (bedrock) geology are displayed in separate maps, but superimposed on the final 'Combined Surface Geology' map. All map legends feature on this page. Not all layers have complete nationwide coverage, so availability of data for relevant map sheets is indicated below.

Geology 1:50,000 Maps Coverage

Map ID:	1
Map Sheet No:	256
Map Name:	North London
Map Date:	2006
Bedrock Geology:	Available
Superficial Geology:	Available
Artificial Geology:	Available
Faults:	Not Supplied
Landslip:	Available
Rock Segments:	Not Supplied

Geology 1:50,000 Maps - Slice A



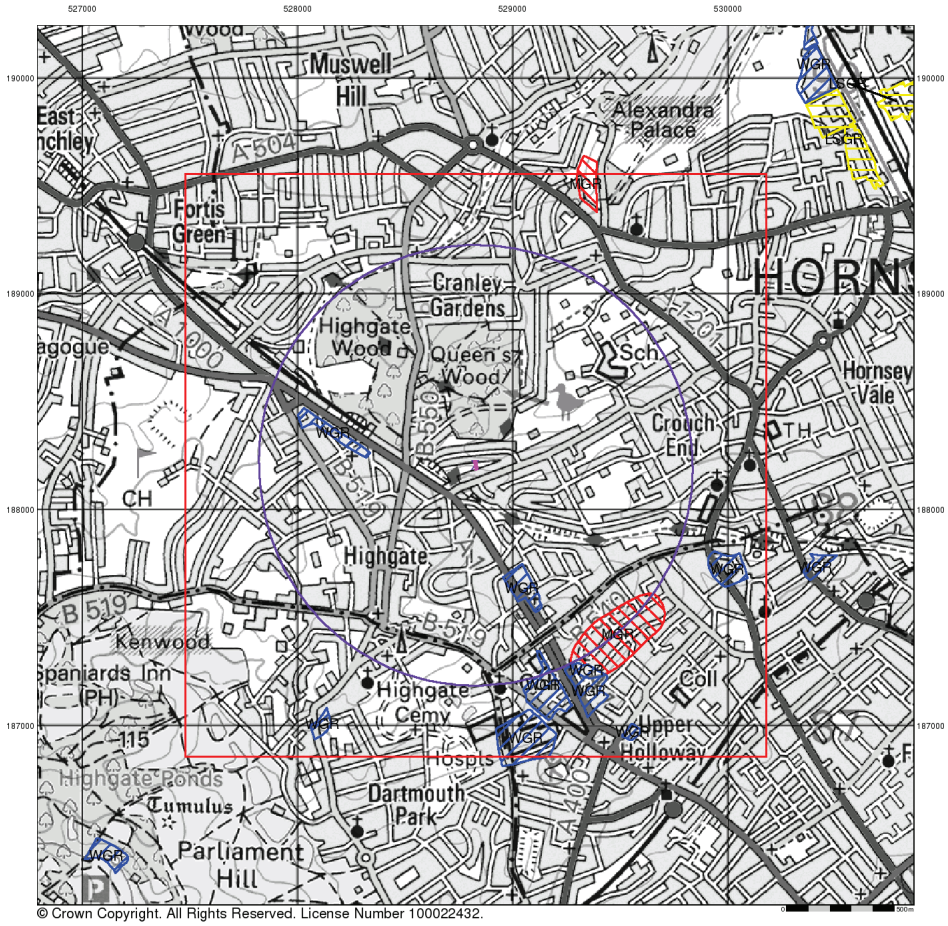
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Order Number:	86009190_1_1
Customer Reference:	J16089
National Grid Reference:	528830, 188210
Slice:	A
Site Area (Ha):	0.04
Search Buffer (m):	1000

Site Details:

33 Priory Gardens, LONDON, N6 5QU

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



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GEA Geotechnical & Environmental Associates

Artificial Ground and Landslip

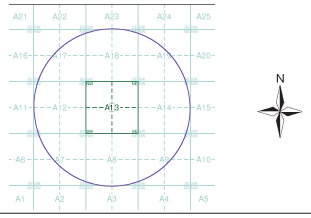
Artificial ground is a term used by BGS for those areas where the ground surface has been significantly modified by human activity. Information about previously developed ground is especially important, as it is often associated with potentially contaminated material, unpredictable engineering conditions and unstable ground.

Artificial ground includes:

- Made ground - man-made deposits such as embankments and spoil heaps on the natural ground surface.
- Worked ground - areas where the ground has been cut away such as quarries and road cuttings.
- Infilled ground - areas where the ground has been cut away then wholly or partially backfilled.
- Landscaped ground - areas where the surface has been reshaped.
- Disturbed ground - areas of ill-defined shallow or near surface mineral workings where it is impracticable to map made and worked ground separately.

Mass movement (landslip) deposits on BGS geological maps are primarily superficial deposits that have moved down slope under gravity to form landslips. These affect bedrock, other superficial deposits and artificial ground. The dataset also includes foundered strata, where the ground has collapsed due to subsidence.

Artificial Ground and Landslip Map - Slice A



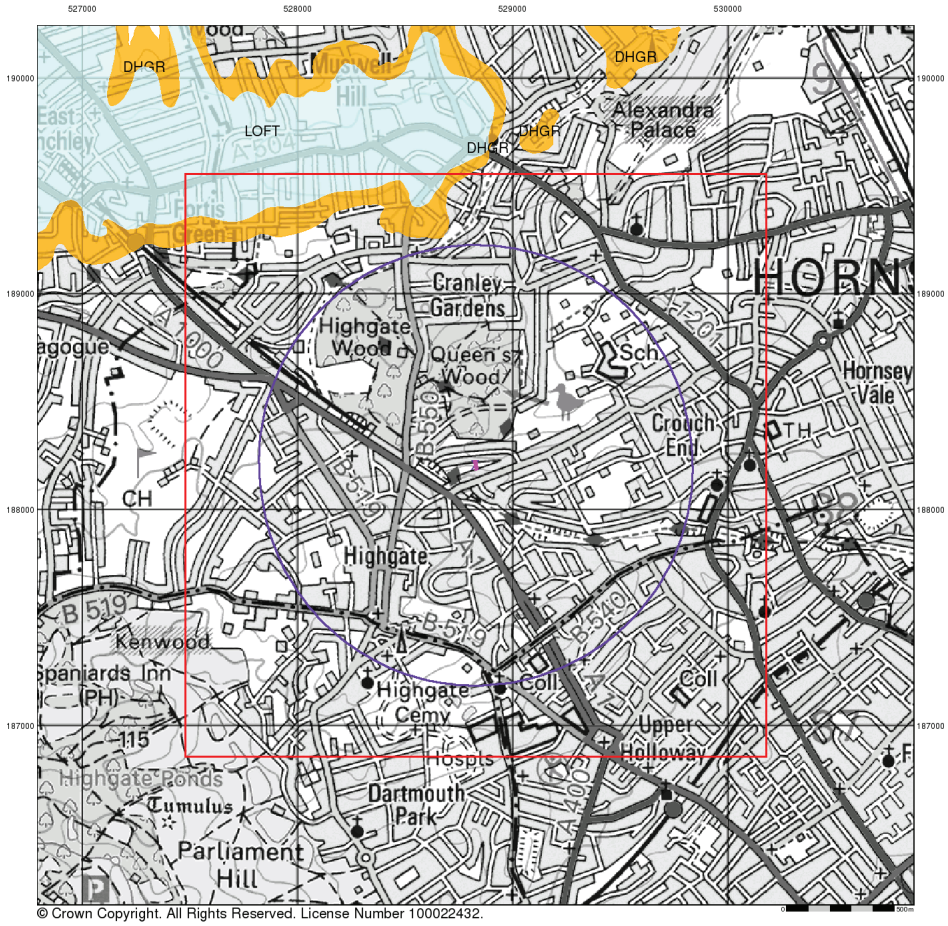
Order Details:

Order Number:	86009190_1_1
Customer Reference:	J16089
National Grid Reference:	528830, 188210
Slice:	A
Site Area (Ha):	0.04
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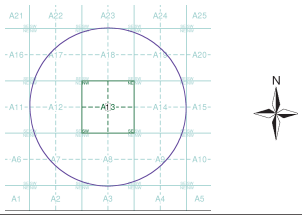
Superficial Geology

Superficial Deposits are the youngest geological deposits formed during the most recent period of geological time, the Quaternary, which extends back about 1.8 million years from the present.

They rest on older deposits or rocks referred to as Bedrock. This dataset contains Superficial deposits that are of natural origin and 'in place'. Other superficial strata may be held in the Mass Movement dataset where they have been moved, or in the Artificial Ground dataset where they are of man-made origin.

Most of these Superficial deposits are unconsolidated sediments such as gravel, sand, silt and clay, and onshore they form relatively thin, often discontinuous patches or larger spreads.

Superficial Geology Map - Slice A



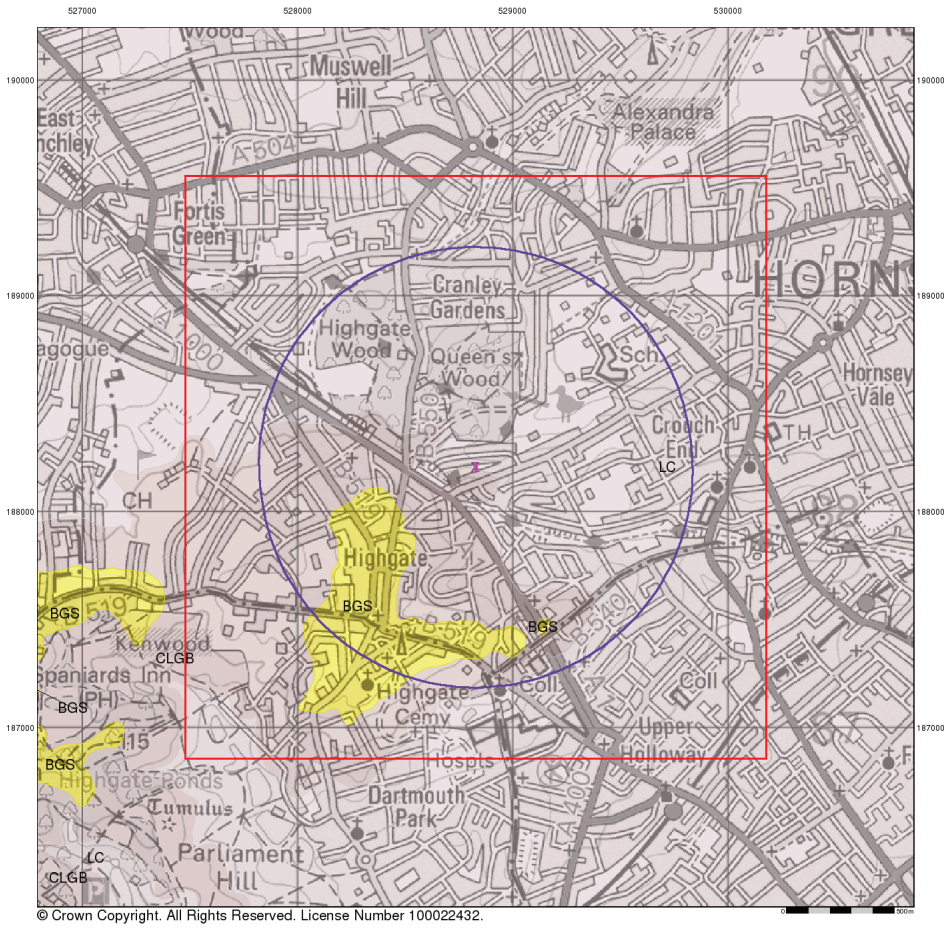
Order Details:

Order Number:	86009190_1_1
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GEA Geotechnical & Environmental Associates

Bedrock and Faults

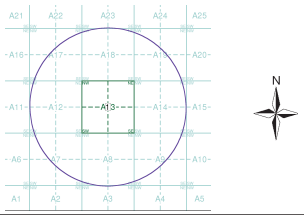
Bedrock geology is a term used for the main mass of rocks forming the Earth and are present everywhere, whether exposed at the surface in outcrops or concealed beneath superficial deposits or water.

The bedrock has formed over vast lengths of geological time ranging from ancient and highly altered rocks of the Proterozoic, some 2500 million years ago, or older, up to the relatively young Pliocene, 1.8 million years ago.

The bedrock geology includes many lithologies, often classified into three types based on origin: igneous, metamorphic and sedimentary.

The BGS Faults and Rock Segments dataset includes geological faults (e.g. normal, thrust), and thin beds mapped as lines (e.g. coal seam, gypsum bed). Some of these are linked to other particular 1:50,000 Geology datasets, for example, coal seams are part of the bedrock sequence, most faults and mineral veins primarily affect the bedrock but cut across the strata and post date its deposition.

Bedrock and Faults Map - Slice A



Order Details:

Order Number:	86009190_1_1
Customer Reference:	J16089
National Grid Reference:	528830, 188210
Slice:	A
Site Area (Ha):	0.04
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