



**76a Queens Road
Caversham
Reading
RG4 8DL**

Contamination Investigation

Oakville Realty Ltd

August 2025

J25160
Rev 0



Ground investigation | Geotechnical consultancy | Contaminated land assessment



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Rev No	Status	Revision Details	Date	Approved for Issue
0	Final		19 August 2025	CE

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This report is intended as a Ground Investigation Report (GIR) as defined in BS EN1997-2, unless specifically noted otherwise. The report is not a Geotechnical Design Report (GDR) as defined in EN1997-2 and recommendations made within this report are for guidance only.

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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 site investigation carried out by Geotechnical and Environmental Associates Limited (GEA) on behalf of Oakville Realty Ltd, with respect to the redevelopment of the site through the demolition of the existing vacant garage workshop and residence at the rear of the site, and the subsequent construction of a pair of two-storey terraced houses with gardens. The purpose of the investigation has been to determine the ground conditions and to assess the extent of any contamination.

Site history

A Phase 1 Contaminated Land Assessment has previously been carried out by GeoSmart Information (report ref: 79681R1 dated August 2023), a copy of which has been provided by the client. The historical mapping indicates that the site was first developed with the existing building by 1932. Neighbouring historical land uses within the immediate surroundings have been predominantly residential. From the mid 1950s, the building on-site has been annotated as a garage and from 1972 the building has been subdivided into a garage and a residential building labelled as 76a. Since then there have been no discernible changes on site.

Ground conditions

The investigation generally confirmed the expected ground conditions in that, beneath a variable thickness of made ground, the Kempton Park Gravel was encountered. The made ground comprised layers of orange-dark brown slightly sandy gravel with fine-coarse subrounded-angular flints, brick and concrete fragments, roots and rootlets and bituminous plastic extending to depths of between 0.50 m and 1.60 m. The Kempton Park Gravel generally comprised layers of orange-brown slightly silty very gravelly clayey sand with fine-coarse angular-rounded flints to the maximum depth of investigation of 2.80 m.

Groundwater was encountered at a depth of 2.10 m in Borehole No 3, within the Kempton Park Gravel.

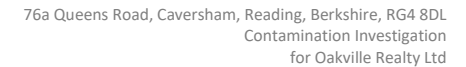
Recommendations

The results of the chemical analyses have indicated elevated concentrations of lead in the made ground and arsenic in the Kempton Park Gravel.

End users will be able to come into direct contact with potentially contaminated soils in the areas of soft landscaping, the majority of which is expected to comprise the garden at the rear of the property. It is recommended that in the proposed areas of soft landscaping, a capping layer of suitable subsoil and topsoil of 600 mm in thickness, in accordance with best practice.

A watching brief should be maintained during demolition and groundworks and if any visual or olfactory evidence of contamination is encountered the local authority will need to be informed and further investigation and testing will be required.

There may be a requirement for a separate remediation proposals report to be prepared to comply with planning requirements. A clean cover system is recommended in areas of soft landscaping, to protect end users. Imported soil will need to be tested for the presence of contamination, and the results should be compared to the screening values for residential areas with plant uptake.



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. Interpretation of the findings is presented in Part 2.

Geotechnical and Environmental Associates Limited (GEA) has been commissioned by Oakville Realty Ltd to carry out a ground investigation at 76a Queens Road, Caversham, Reading, RG4 8DL.

It is understood that it is proposed to demolish the existing redundant garage workshop and residence and subsequently construct a two-storey residential building comprising a pair of terraced houses to infill the adjoining terrace. The plan below shows the proposed site layout.



- to provide an assessment of the risk of encountering unexploded ordnance (UXO);
- to determine the ground conditions;
- to provide an indication of the degree of soil contamination present; and
- to assess the risk that any such contamination may pose to the proposed development, its users or the wider environment.

A Phase 1 Contaminated Land Assessment has previously been carried out by GeoSmart Information (report ref: 79681R1 dated August 2023), a copy of which has been provided by the client. In the light of this desk study, an intrusive ground investigation was carried out which comprised, in summary, the following activities:

- commissioning and review of a Preliminary UXO Risk Assessment;
- a walkover survey of the site carried out in conjunction with the fieldwork;
- four window sampler boreholes advanced to depths of 2.20 m, 1.60 m, 2.80 m, and 2.00 m;
- standard penetration tests (SPTs) carried out at regular intervals within the boreholes to provide quantitative data on the strength of the soils;
- testing of selected soil samples for contamination; and
- provision of a report presenting and interpreting the above data, together with our advice and recommendations with respect to the proposed development.



This report includes a contaminated land assessment which has been undertaken by a suitably qualified and competent professional in accordance with the methodology presented by the Environment Agency in their Land contamination risk assessment (LCRM)¹ Updated 12 June 2025. This involves identifying, making decisions on, and taking appropriate action to deal with land contamination in a way that is consistent with government policies and legislation within the United Kingdom. Risk management is divided into three stages; Risk Assessment, Options Appraisal and Remediation, and each stage comprises three tiers. The Risk Assessment stage includes preliminary risk assessment (PRA), generic quantitative risk assessment (GQRA) and detailed quantitative risk assessment (DQRA) and this report includes the PRA and GQRA.

2.0 The Site

2.1 Site Description

The site is located in the Reading suburb of Caversham, approximately 350 m north of the River Thames and 680 m northeast of Reading railway station. It fronts onto Queens Road to the south and is bound by two-storey terraced houses to the east and west, and by two-storey terraced houses to the north at the rear of the property. The site may be additionally located by National Grid Reference 472080, 174470 and is shown on the map extract below.



¹ <https://www.gov.uk/government/publications/land-contamination-risk-management-lcrm>



A walkover of the site was carried out by a geotechnical engineer from GEA at the time of the fieldwork in July 2025. The site is rectangular in shape and measures approximately 25 m north-south by 8 m east-west. It is currently occupied by a single storey redundant garage workshop in the south, with a vacant private residence at the rear of the property in the north. The site is essentially level and is situated at approximately 38.0 m OD. The site is predominantly occupied by the existing buildings, with the exception of a small area of hardstanding at the front and alongside the western site boundary. There is also a small garden at the rear of the property with a small wooden shed along the northern building edge. Photos of the site are included in the appendix.

Whilst on site no notable odours were identified in the garage area and no above ground or evidence of below ground tanks were noted. The floor of the garage comprised suspended timber floor boards and although some staining of the boards was noted, the ground below was free from any residues or staining.

2.2 Site History

The site history has been determined from the Phase 1 Contaminated Land Assessment by GeoSmart Information (report ref: 79681R1 dated August 2023).

Historical mapping indicates that the site was first developed with the existing building in 1932. The footprint of the building at that time is consistent with the existing footprint. Neighbouring historical land uses within the immediate surroundings have been predominantly residential. From 1956-1957, the building on-site has been annotated as a garage and from 1972 the building has been subdivided into the garage and a residential building labelled as 76a. Since that time there have been no discernible changes on site.

2.3 Preliminary UXO Risk Assessment

A Preliminary UXO Risk Assessment has been completed by 1st Line Defence (report ref PA21679-00, dated 3rd July 2025), and this report is included in the appendix. The risk assessment has been carried out in accordance with the guidelines provided by CIRIA², which state that the likelihood of encountering and detonating UXO below a site should be assessed along with establishing the consequences that may arise. The first phase comprises a preliminary risk assessment, which should be undertaken at an early stage of the development planning. If such an assessment identifies a high level of risk then a detailed risk assessment should be carried out by a UXO specialist, which will identify an appropriate course of action with regard to risk mitigation.

The report indicates that, during World War II (WWII), the site was situated within the County Borough of Reading. According to official Home Office bombing statistics, this district sustained an overall very low density of bombing with just five HE bombs recorded across the district. Four of these bombs were dropped on the 10th February 1943 and struck Friar Street, The People's Pantry and Minster Street in Reading town centre. The location of the fifth bomb in the borough is unclear, but it is thought unlikely to have fallen near the site. Given the lack of positive evidence of bombing in the area, as well as developed nature of the site and surrounding area, there is not considered to be an increased risk of UXO on site.

Given the findings of this preliminary report, the risk of UXO contamination is not considered to be above the 'background risk' for this area and it is not thought likely that additional research, in the form of a Detailed UXO Risk Assessment, would significantly alter the findings of this report. It is therefore recommended that no further action is taken.

2.4 Geology

The British Geological Survey (BGS) map of the area indicates that the site is underlain by the Kempton Park Gravel, which is underlain by the undifferentiated Seaford Chalk Formation and Newhaven Chalk Formation.

2.5 Hydrology and Hydrogeology

The Kempton Park Gravel is classified as a Secondary A Aquifer, which refers to permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. The Seaford Chalk Formation and Newhaven Chalk Formation are classified as Principal Aquifers. The EA defines a Principal Aquifer as layers of rock or drift deposits that have high intergranular and/or fracture permeability, such that they usually provide a high level of water storage. In most cases, Principal Aquifers are aquifers previously designated as major aquifers.

The nearest water feature is an unnamed stream, located approximately 95 m south of the site boundary. There are no environmentally sensitive land uses within 500 m of the site.

The site is predominantly covered by the existing building and hardstanding, and therefore infiltration of rain water is limited in the south such that the majority of surface runoff likely drains into combined sewers along Queens Road. In the north, softstanding ground will allow infiltration of rain water.



2.6 Preliminary Risk Assessment

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. 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 a source-pathway-receptor approach.

2.6.1 Source

The use of the site as a vehicle repair garage could have led to the contamination of the ground with hydrocarbons in the form of fuel or lubrication oil. Metals from fuel or paint, solvents and degreasers from cleaning parts, volatile organic compounds from re-spraying or asbestos from brake lining.

The Geosmart report did not highlight any nearby sources of landfill gas.

2.6.2 Receptor

The site is directly underlain by the Seaford Chalk Formation and Newhaven Chalk Formation which represent Principal Aquifers; groundwater is therefore a highly sensitive receptor. Following redevelopment, the site will have a residential use and this will result in end users representing potential receptors. Users of adjacent sites are also considered to be sensitive receptors.

Within the site, end users will be largely isolated from direct contact with any contaminants present within the made ground by the presence of buildings and the extent of the hardstanding, however soft landscaping will present a potential exposure pathway.

Buried services are likely to come into contact with any contaminants present within the soils through which they pass and site workers are potential receptors during construction or maintenance works.

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

2.6.3 Pathway

Human Health pathways comprise the following: Dermal contact, ingestion & inhalation of soils & soil dust. Consumption of home grown produce. Ingress into water supply pipework and subsequent water ingestion. Migration of any soil vapours to surface; inhalation indoors. Liberation of any sub surface ACMs and inhalation of asbestos fibres.

Controlled Water pathways comprise the following: Dissolution into pore water/shallow groundwater and subsequent migration. Dissolution into aqueous phase and preferential migration via drainage structures. Lateral and vertical groundwater movement via natural or artificial flow paths.

2.6.4 Preliminary Risk Appraisal

On the basis of the above it is considered that there is a MODERATE/LOW risk of there being a significant contaminant linkage at this site which would result in a requirement for major remediation work.



3.0 Exploratory Work

In order to meet the objectives described in Section 1.2, four window sampler boreholes were advanced to depths of 2.20 m, 1.60 m, 2.80 m, and 2.00 m.

Standard Penetration Tests (SPTs) were carried out at regular intervals to provide additional quantitative data on the strength of soils encountered. A selection of the samples recovered from the boreholes were submitted to an analytical laboratory for a programme of contamination testing.

All of the above work was carried out under the supervision of a geotechnical engineer from GEA. The borehole records are appended, together with a site plan indicating the exploratory positions.

3.1 Sampling Strategy

The borehole locations were positioned by an engineer from GEA with respect for the proposed development, in accessible areas, whilst avoiding any areas of known buried services and overhead electricity cables. Whilst two boreholes were originally planned, BH1 and BH2 refused at respective depths of 2.20 m and 1.60 m, and so two further boreholes were drilled in order to obtain a sufficient coverage of the site for contamination testing.

Four samples from a range of depths have been tested for the presence of contamination. The analytical suite of testing was selected to identify a range of typical industrial contaminants for the purposes of general coverage. The analytical suite for the soil included a range of metals, speciation of total petroleum hydrocarbons (TPH), polycyclic aromatic hydrocarbons (PAH), total cyanide and monohydric phenols. Selected samples were also screened for the presence of asbestos. The analyses were carried out at an MCERTs accredited laboratory with the majority of the testing suite accredited to MCERTS standards. A summary of the MCERTs accreditation and test methods are included with the attached results and further details are available upon request.

4.0 Ground Conditions

The investigation has generally confirmed the expected ground conditions in that, beneath a variable thickness of made ground, the Kempton Park Gravel was encountered. The underlying Seaford Chalk Formation and Newhaven Chalk Formations were not encountered.

4.1 Made Ground

The made ground comprised layers of orange-dark brown slightly sandy gravel with fine-coarse subrounded-angular flints, brick and concrete fragments, roots and rootlets and bituminous plastic extending to depths of between 0.50 m and 1.60 m.

Apart from the presence of fragments of extraneous material noted above, no visual or olfactory evidence of contamination was observed during the fieldwork. Two samples of the made ground have been analysed for a range of contaminants as a precautionary measure and the results are detailed within Section 4.6.

4.2 Kempton Park Gravel

The Kempton Park Gravel generally comprised layers of orange-brown slightly silty very gravelly clayey sand with fine-coarse angular-rounded flints. Clay was often extremely dry near the ground surface, becoming damp and then wet with increasing depth. SPT results indicated that the gravel was very dense. The depth of the boreholes was limited by the density of the granular soil.

No visual or olfactory evidence of contamination was observed during the fieldwork. Two samples of the Kempton Park Gravel have been analysed for a range of contaminants as a precautionary measure and the results are detailed within Section 4.6.

4.3 Groundwater

Groundwater was encountered at a depth of 2.10 m in Borehole No 3 within the Kempton Park Gravel.



4.4 Soil Contamination

The table below sets out the values measured within the four samples analysed; all concentrations are in mg/kg unless otherwise stated.

Determinant	BH1 0.50 m	BH1 1.50 m	BH3 0.50 m	BH3 2.50 m
pH	7.7	8.9	8.4	9.7
Arsenic	26	25	22	47
Cadmium	1.8	0.4	0.4	0.4
Chromium	34	28	31	21
Lead	240	62	62	33
Mercury	0.4	< 0.3	< 0.3	< 0.3
Selenium	1.6	1.6	1.1	1.3
Copper	84	20	20	13
Nickel	32	26	26	19
Zinc	350	120	200	130
Total Cyanide	< 1.0	< 1.0	< 1.0	< 1.0
Total Phenols	< 1.0	< 1.0	< 1.0	< 1.0
Total PAH	9.23	1.65	7.7	9.04
Sulphide	< 1.0	1.1	< 1.0	2.9
Benzo(a)pyrene	0.93	0.11	0.84	0.74
Naphthalene	< 0.05	< 0.05	< 0.05	0.08
Benzo(b)fluoranthene	1.4	0.24	1.1	0.97
Dibenz(a h)anthracene	0.12	< 0.05	0.1	0.09
TPH	37	< 10	16	16
Total Organic Carbon %	1.8	0.5	0.7	0.3

In addition, all four samples have been screened for the presence of asbestos and the results show that none was detected.

4.4.1 Generic Quantitative Risk Assessment

The use of a risk-based approach has been adopted to provide an initial screening of the test results to assess the need for subsequent site-specific risk assessments. Contaminants of concern are those that have values in excess of generic human health risk-based guideline values, which are either the CLEA³ Soil Guideline Values where available, the Suitable 4 Use Values⁴ (S4UL) produced by LQM/CIEH calculated using the CLEA UK Version 1.07⁵ software, or the DEFRA Category 4 Screening values⁶, assuming a residential end use with plant uptake. The key generic assumptions for this end use are as follows:

- that groundwater will not be a critical risk receptor;
- that the critical receptor for human health will be young female children aged less than six years old;
- that the exposure duration will be six years;
- that the critical exposure pathways will be indoor dust ingestion, skin contact with indoor dust, and inhalation of indoor and outdoor dust and vapours; and
- that the building type equates to a two-storey small terraced house.

It is considered that these assumptions are acceptable for this generic assessment of this site from a human health perspective. The tables of generic screening values derived by GEA and an explanation of how each value has been derived are included in the Appendix.

Where contaminant concentrations are measured at concentrations below the generic screening value it is considered that they pose an acceptable level of risk and thus further consideration of these contaminant concentrations is not required. However, where concentrations are measured in excess of these generic screening values there is

³ Updated Technical Background to the CLEA Model (Science Report SC050021/SR3) Jan 2009 and Soil Guideline Value reports for specific contaminants; all DEFRA and Environment Agency.

⁴ The LQM/CIEH S4ULs for Human Health Risk Assessment S4UL3065 November 2014

⁵ Contaminated Land Exposure Assessment (CL|EA) Software Version 1.071 Environment Agency 2015

⁶ CL:AIRE (2013) Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination Final Project Report SP1010 and DEFRA (2014) Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination Policy Companion Document SP1010



considered to be a potential that they could pose an unacceptable risk and thus further action will be required which could include;

- additional testing to zone the extent of the contaminated material and thus reduce the uncertainty with regard to its potential risk;
- site specific risk assessment to refine the assessment criteria and allow an assessment to be made as to whether the concentration present would pose an unacceptable risk at this site; or
- soil remediation or risk management to mitigate the risk posed by the contaminant to a degree that it poses an acceptable risk.

The results of the chemical analyses have indicated that one of the four samples tested (BH3 2.50 m) contained an elevated concentration of arsenic, while one of the samples (BH1 0.50 m) contained an elevated concentration of lead. The table below indicates contaminants of concern.

Contaminant of Concern	Maximum concentration recorded (mg/kg)	Location of max concentration	Generic Risk-Based Screening Value
Arsenic	47	BH3 – 2.50 m	37
Lead	240	BH1 – 0.50 m	200

The significance of these results is considered further in Part 2 of the report.



Part 2: Design Basis Report

This section of the report provides an interpretation of the findings detailed in Part 1, in the form of a ground model, and then provides advice and recommendations with respect to the proposed development.

5.0 Ground Model

It is proposed to demolish the existing redundant garage workshop and residence to the rear of the site and subsequently construct two terraced houses with private gardens. The loads are not known but are anticipated to be moderate.

The desk study has found that the site has had a potentially contaminative history, as it has been used as a vehicle repair garage since 1956-1957, and on the basis of the fieldwork, the ground conditions can be characterised as follows:

-  below a variable thickness of made ground, Kempton Park Gravel is present which extends to the maximum depth of investigation, of 2.80 m;
-  the made ground comprises layers of orange-dark brown slightly sandy gravel with fine-coarse subrounded-angular flints, brick and concrete fragments, roots and rootlets and bituminous plastic extending to depths of between 0.50 m and 1.60 m;
-  the Kempton Park Gravel generally comprises of layers of orange-brown slightly silty very gravelly clayey sand with fine-coarse angular-rounded flints to the maximum depth of investigation, of 2.80 m;
-  groundwater was present within the Kempton Park Gravel at a depth of approximately 2.10 m; and
-  contamination testing has revealed the presence of lead contamination within the made ground and arsenic in the underlying Kempton Park Gravel.

6.0 Advice & Recommendations

6.1 Contamination Risk Assessment

The results of the chemical analyses have indicated elevated concentrations of lead within the made ground and arsenic within the Kempton Park Gravel tested.

The exact sources of the lead contamination are unknown but the made ground was noted as containing fragments of extraneous material and it is possible that fragments of such material, for example, coal or old paint fragments, could account for the elevated concentration. Given the historical use as a garage since the mid 1950s, vehicle emissions during this time could have resulted in airborne lead which would have settled to the ground and may account for the elevated concentrations.

Slightly elevated concentrations of arsenic were recorded at a depth of 2.5 m whilst a sample from 0.5 m in the same borehole did not record an elevated concentration. It is therefore anticipated that the arsenic may be naturally occurring and not from a surface source.

The lead contamination on site is not likely to be in a soluble state and should not, therefore, pose a risk to adjacent sites, groundwater or buried services. However, it may pose a risk to site workers during construction, and to end users in proposed areas of soft landscaping. These risks are further assessed below.

6.1.1 Site Workers

Site workers should be made aware of the contamination and a programme of working should be identified to protect workers handling any soil. The method of site working should be in accordance with guidelines set out by HSE⁷ and CIRIA⁸ and the requirements of the Local Authority Environmental Health Officer.

A watching brief should be maintained during demolition and groundworks and if any visual or olfactory evidence of contamination is encountered the local authority will need to be informed and further investigation and testing will be required.

7 HSE (1992) HS(G)66 *Protection of workers and the general public during the development of contaminated land*
HMSO

8 CIRIA (1996) *A guide for safe working on contaminated sites* Report 132, Construction Industry Research and Information Association



6.1.2 End Users

End users will be able to come into direct contact with potentially contaminated soils in the areas of soft landscaping, the majority of which is expected to comprise the garden at the rear of the property, and here there will also be the opportunity for contaminated soils to adhere to any home grown produce.

It is recommended that in the proposed areas of soft landscaping, a capping layer of suitable subsoil and topsoil of 600 mm in thickness, in accordance with best practice. The capping layer will prevent direct contact with the potentially contaminated soils below the site and will ensure successful plant growth.

Samples of imported soil will need to be collected from site and tested for the presence of contamination and the results of soils in the areas of soft landscaping will need to be compared to screening values for areas with a residential end use and with plant uptake.

6.2 Effect of Sulphates

Chemical analyses have revealed relatively low concentrations of soluble sulphate and near-neutral to alkaline pH in accordance with Class DS-1 conditions of Table C2 of BRE Special Digest 1:SD Third Edition (2005). The measured pH values of the samples show that an ACEC class of AC-1s would be appropriate for the site. This assumes a static water condition at the site. The guidelines contained in the digest should be followed in the design of foundation concrete.

6.3 Waste Disposal

Under the Waste Framework Directive, waste is classified as being either Hazardous or Non-Hazardous and landfills receiving waste are classified as accepting hazardous or non-hazardous wastes or the non-hazardous sub-category of inert waste in accordance with the Waste Directive. Waste classification is a staged process and this investigation represents the preliminary sampling exercise of that process. Once the extent and location of the waste that is to be removed has been defined, further sampling and testing may be necessary. The results from this ground investigation should be used to help define the sampling plan for such further testing, which could include WAC leaching tests where the totals analysis indicates the soil to be a hazardous waste or inert waste from a

contaminated site. It should however be noted that the Environment Agency guidance WM3⁹ states that landfill WAC analysis, specifically leaching test results, must not be used for waste classification purposes.

Any spoil arising from excavations or landscaping works, which is not to be re-used in accordance with the CL:AIRE¹⁰ guidance, will need to be disposed of to a licensed tip. Waste going to landfill is subject to landfill tax at either the current standard rate of £126.15 per tonne (about £231.00 per m³) or at the lower rate of £4.05 per tonne (roughly £7.50 per m³). However, the classifications for tax purposes and disposal purposes differ and currently all made ground and topsoil is taxable at the ‘standard’ rate and only naturally occurring soil and stones, which are accurately described as such in terms of the 2011 Order, would qualify for the ‘lower rate’ of landfill tax.

Based on the technical guidance provided by the EA it is considered likely that the soils encountered during this ground investigation, as represented by the chemical analyses carried out, would be generally classified as follows.

Soil Type	Waste Classification (Waste Code)	WAC Testing Required Prior to Landfill Disposal?	Current applicable rate of Landfill Tax
Made ground	Non-hazardous (17 05 04)	No	£126.15/tonne (Standard rate)

Under the requirements of the Waste Directive all waste needs to be pre-treated prior to disposal. The pre-treatment process must be physical, thermal, chemical or biological, including sorting. It must change the characteristics of the waste in order to reduce its volume, hazardous nature, facilitate handling or enhance recovery. The waste producer can carry out the treatment but they will need to provide documentation to prove that this has been carried out. Alternatively, the treatment can be carried out by an approved contractor. The Environment Agency has issued a position paper¹¹ which states that in certain circumstances, segregation at source may be considered as pre-treatment and thus excavated material may not have to be treated prior to landfilling if the soils can be segregated onsite prior to excavation by sufficiently characterising the soils insitu prior to excavation.

9 Environment Agency 2015. *Guidance on the classification and assessment of waste*. Technical Guidance WM3 First Edition
10 CL:AIRE March 2011. *The Definition of Waste: Development Industry Code of Practice* Version 2

11 Environment Agency 23 Oct 2007 *Regulatory Position Statement Treating non-hazardous waste for landfill - Enforcing the new requirement*





The above opinion with regard to the classification of the excavated soils is provided for guidance only and should be confirmed by the receiving landfill once the soils to be discarded have been identified. The local waste regulation department of the Environment Agency (EA) should be contacted to obtain details of tips that are licensed to accept the soil represented by the test results. The tips will be able to provide costs for disposing of this material but may require further testing.

7.0 Outstanding Risks & Issues

This section of the report aims to highlight areas where further work is required as a result of limitations on the scope of this investigation, or where issues have been identified by this investigation that warrant further consideration. The scope of risks and issues discussed in this section is by no means exhaustive, but covers the main areas where additional work may be required.

7.1 Site-Specific Risks

This investigation has identified the presence of contamination and there may be a requirement for a separate remediation proposals report to be prepared to comply with planning requirements. The remediation will need to be supervised and verified by a geoenvironmental engineer and a completion or validation report will also probably be required to support the planning application.

If during ground works any visual or olfactory evidence of contamination is identified it is recommended that further investigation be carried out and that the risk assessment is reviewed.

These areas of doubt should be drawn to the attention of prospective contractors and further investigation will be required or sufficient contingency should be provided to cover the outstanding risk.

7.2 General Risks

The ground is a heterogeneous natural material and variations will inevitably arise between the locations at which it is investigated. This report provides an assessment of the general ground conditions based on the discrete points at which the ground was sampled, but there may be ground conditions (including soil, rock, gas and groundwater) elsewhere on site that have not been revealed by this investigation and therefore could not have been taken into account in this report. The ground conditions should be subject to review as the development proceeds to ensure that any variations from the Ground Model are properly assessed by a suitably qualified person.

The comments made regarding gas and groundwater are based on observations made during the period the work has been carried out. Conditions may vary as a result of seasonal or other effects.

Where any conclusions and recommendations contained in this report have been based upon information provided by others, it has been assumed that all relevant information has been provided by those parties and that such information is accurate. Any such information has not been independently verified by GEA, unless otherwise stated in the report. GEA accepts no liability for any inaccurate conclusions, assumptions or actions taken resulting from any inaccurate information supplied to GEA from others.



76a Queens Road, Caversham, Reading, Berkshire, RG4 8DL
Contamination Investigation
for Oakville Realty Ltd

Appendix

a. Field Work

Site Plan
Borehole Records
Site Photos

b. Lab Testing

Chemical Test Results
Generic Risk Based Screening Values

c. Desk Study

UXO Preliminary Risk Assessment



appendix a

Field Work

Site Plan
Borehole Records
Site Photos

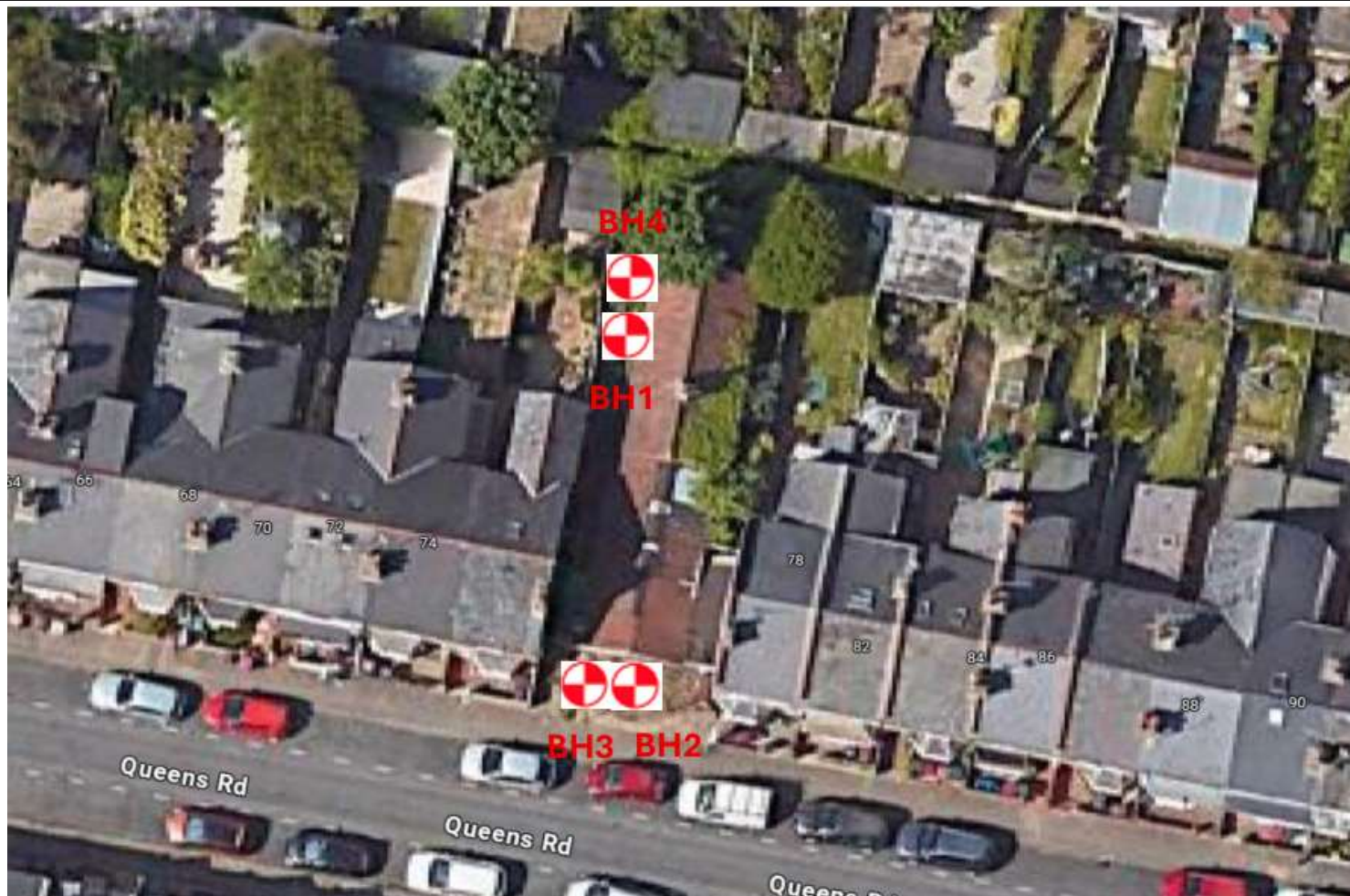
Site 76a Queens Road, Caversham, Reading, Berkshire, RG4 8DL

Client Oakville Realty

Engineer

Job Number
J25160

Sheet
1 / 1



					Dynamic (Windowless) Sampler BH1 Sheet 1 of 1							
Hole Type WS					Easting		Northing		Ground Level (m)		Scale 1:50	
Project Name 76a Queens Road					Project No. J25160		Start Date 2025-07-11		End Date 2025-07-11			
Client Oakville Realty Ltd					Contractor KDS Site Investigation Ltd					Consultant LH		
Inst/ Backfill	Water Levels	Samples and Tests			Level (m)	Depth (thickness) (m)	Strata					
		Depth (m)	Type/ Ref	Results			Legend	Description				
		0.50	ES			(0.50)		Dark brown slightly sandy gravelly MADE GROUND with medium angular-subrounded flints, concrete, roots and rootlets.				
						0.50		Orange-brown slightly silty desiccated clayey SAND	0.5			
		1.00	SPT	N=50 (5,5/6 for 0mm)		(0.50) 1.00 (0.15) 1.15		Light brown very gravelly SAND with fine-coarse gravels of flint and cobbles of concrete.	1.0			
		1.50	ES			(0.35) 1.50		Dark brown very gravelly SAND	1.5			
						1.50		Sandy GRAVEL with fine-coarse gravels of flint				
		2.00	SPT	N=50 (12,13/16 for 0mm)		(0.50) 2.00 (0.20) 2.20		Orange slightly gravelly SAND. Sand is coarse and damp, and gravels are medium flints.	2.0			
								End of Borehole at 2.20m	2.5			
									3.0			
									3.5			
									4.0			
									4.5			
									5.0			
									5.5			
									6.0			
									6.5			
									7.0			
									7.5			
									8.0			
									8.5			
									9.0			
									9.5			
									10.0			
Remarks Groundwater not encountered. Backfilled with arisings.								Method, Plant, Stability, Dimensions 0.00 - 2.20m		Logger LH		

BH2
Sheet 1 of 1

Sheet 1 of 1

Scale
1:50

End Date
2025-07-11

Consultant
LH

[illegible]

Logger
LH

					Dynamic (Windowless) Sampler BH3 Sheet 1 of 1						
					Hole Type WS		Easting	Northing	Ground Level (m)		Scale 1:50
					Project Name 76a Queens Road		Project No. J25160		Start Date 2025-07-11		End Date 2025-07-11
Client Oakville Realty Ltd					Contractor KDS Site Investigation Ltd			Consultant LH			
Inst/ Backfill	Water Levels	Samples and Tests			Level (m)	Depth (thickness) (m)	Strata				
		Depth (m)	Type/ Ref	Results			Legend	Description			
		0.50	ES	N=50 (5,7/7 for 0mm)		(0.40)		Dark brown slightly sandy gravelly MADE GROUND. Gravels are fine-coarse brick fragments, bituminuous plastic and flints.			
		1.00	SPT			0.40		Brown slightly sandy gravelly MADE GROUND. Gravels are fine-coarse brick fragments and flints. Sand is damp.	0.5		
						0.50		Dark brown very gravelly sandy MADE GROUND with concrete and flint. Sand is damp.	Inspection pit to 0.90m (0.90m)	1.0	
						0.90					
			1.20			Orange-brown silty gravelly SAND	1.5				
		2.00	SPT	N=50 (10,10/8 for 0mm)	1.50		Orange-brown silty slightly gravelly SAND. Sand is wet.	1.5			
						(1.30)			2.0		
						2.50			2.5		
		2.80	SPT	N=50 (11,15/14 for 0mm)	2.80			3.0			
								3.5			
								4.0			
								4.5			
								5.0			
								5.5			
								6.0			
								6.5			
								7.0			
								7.5			
								8.0			
								8.5			
								9.0			
								9.5			
								10.0			
Remarks Groundwater encountered at 2.10 m. Backfilled with arisings.								Method, Plant, Stability, Dimensions 0.00 - 2.80m		Logger LH	

BH4
Sheet 1 of 1

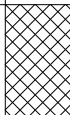
Sheet 1 of 1

Hole Type	Easting	Northing	Ground Level (m)	Scale
WS				1:50
Project Name		Project No.	Start Date	End Date
76a Queens Road		J25160	2025-07-11	2025-07-11

Client
Oakville Realty Ltd

Contractor
KDS Site Investigation Ltd

Consultant
LH

Inst/ Backfill	Water Levels	Samples and Tests			Level (m)	Depth (thickness) (m)	Strata		
		Depth (m)	Type/ Ref	Results			Legend	Description	
		1.00	SPT	N=50 (8,8/8 for 0mm)		(0.80)		Orange-brown gravelly MADE GROUND with fine concrete and flints	0.5
						0.80 (0.20) 1.00		Dark brown-grey gravelly SAND with fine-coarse subrounded-rounded flints	1.0
						(0.50)		Brown-dark brown stiff sandy gravelly CLAY with angular-subangular flints	1.5
						1.50 (0.50)		Orange-light brown damp gravelly SAND with fine-medium angular flints. Sand is coarse.	2.0
		2.00		----- End of Borehole at 2.00m		2.0			
							2.5		
							3.0		
							3.5		
							4.0		
							4.5		
				5.0					
				5.5					
				6.0					
				6.5					
				7.0					
				7.5					
				8.0					
				8.5					
				9.0					
				9.5					
				10.0					

Remarks
Groundwater not encountered. Backfilled with arisings.

Method, Plant, Stability, Dimensions
0.00 - 2.00m

Logger
LH



GEA

Widbury Barn
Widbury Hill
Ware
Herts SG12 7QE

Site Inspection Record

Site 76a Queens Road, Caversham, Reading, Berkshire, RG4 8DL

Date of Inspection
11/07/2025

Job Number
J25160

Client Oakville Realty Ltd

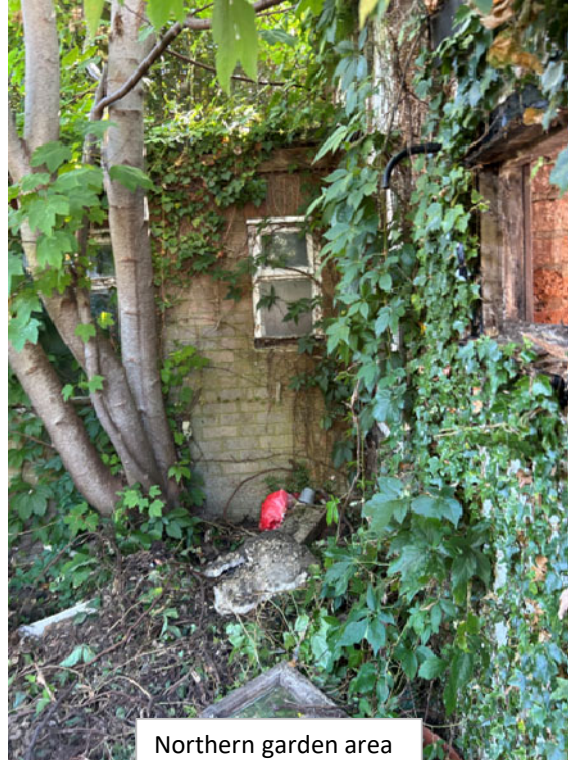
GEA Engineer
LH

Sheet
1 / 1

Engineer



Western boundary, looking south



Northern garden area



Northwestern corner



appendix b

Lab Testing

Chemical Test Results
Generic Risk Based Screening Values

Geotechnical & Environmental Associates
Widbury Barn
Widbury Hill
Ware
Hertfordshire
SG12 7QE

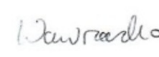
i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

t: 01923 225404
f: 01923 237404
e: reception@i2analytical.com

e: lauren.highland@gea-ltd.co.uk

Analytical Report Number : 25-037129

Project / Site name:	76a Queens Road	Samples received on:	14/07/2025
Your job number:	J25160	Samples instructed on/ Analysis started on:	14/07/2025
Your order number:		Analysis completed by:	18/07/2025
Report Issue Number:	1	Report issued on:	18/07/2025
Samples Analysed:	4 soil samples		


Signed: _____

Joanna Wawrzeczko
Senior Reporting Specialist
For & on behalf of i2 Analytical Ltd.

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

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

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

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting
air	- once the analysis is complete

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

Retention period for records and reports is minimum 6 years from the date of issue of the final report.
Some records may be kept for longer according to other legal/best practice requirements.

Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.

Analytical Report Number: 25-037129
Project / Site name: 76a Queens Road

Lab Sample Number	613573	613574	613575	613576
Sample Reference	BH1	BH1	BH3	BH3
Sample Number	None Supplied	None Supplied	None Supplied	None Supplied
Water Matrix	N/A	N/A	N/A	N/A
Depth (m)	0.50	1.50	0.50	2.50
Date Sampled	11/07/2025	11/07/2025	11/07/2025	11/07/2025
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Test Limit of detection	Test Accreditation Status	

Stone Content	%	0.1	NONE	< 0.1	34	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	7.5	5.4	13	12
Total mass of sample received	kg	0.1	NONE	0.8	1.2	0.9	1.3

Asbestos

Asbestos in Soil Detected/Not Detected	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	SPU	SPU	SPU	SPU
Analysis completed	N/A	N/A	N/A	17/07/2025	17/07/2025	17/07/2025	17/07/2025

General Inorganics

pH (L099)	pH Units	N/A	MCERTS	7.7	8.9	8.4	9.7
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
Total Sulphate as SO ₄	mg/kg	50	MCERTS	830	660	540	670
Water Soluble Sulphate as SO ₄ 16hr extraction (2:1)	mg/kg	2.5	MCERTS	59	93	38	180
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.0294	0.0466	0.019	0.0912
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	29.4	46.6	19	91.2
Sulphide	mg/kg	1	MCERTS	< 1.0	1.1	< 1.0	2.9
Water Soluble Chloride (2:1)	mg/kg	1	MCERTS	2	4.5	2.7	15
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	1.8	0.5	0.7	0.3

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	0.08
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	0.07
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	0.64	0.18	0.38	0.97
Anthracene	mg/kg	0.05	MCERTS	0.12	< 0.05	0.06	0.12
Fluoranthene	mg/kg	0.05	MCERTS	1.5	0.31	1.3	1.7
Pyrene	mg/kg	0.05	MCERTS	1.4	0.27	1.2	1.5
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.74	0.11	0.58	0.56
Chrysene	mg/kg	0.05	MCERTS	0.87	0.16	0.79	0.81
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	1.4	0.24	1.1	0.97
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	0.38	0.05	0.36	0.45
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.93	0.11	0.84	0.74
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.56	0.09	0.52	0.45
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	0.12	< 0.05	0.1	0.09
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.65	0.12	0.56	0.5

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	9.23	1.65	7.7	9.04
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Analytical Report Number: 25-037129
Project / Site name: 76a Queens Road

Lab Sample Number				613573	613574	613575	613576
Sample Reference				BH1	BH1	BH3	BH3
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied
Water Matrix				N/A	N/A	N/A	N/A
Depth (m)				0.50	1.50	0.50	2.50
Date Sampled				11/07/2025	11/07/2025	11/07/2025	11/07/2025
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Test Limit of detection	Test Accreditation Status				

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	26	25	22	47
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	1.8	0.4	0.4	0.4
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	34	28	31	21
Copper (aqua regia extractable)	mg/kg	1	MCERTS	84	20	20	13
Lead (aqua regia extractable)	mg/kg	1	MCERTS	240	62	62	33
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	0.4	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	32	26	26	19
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	1.6	1.6	1.1	1.3
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	350	120	200	130

Petroleum Hydrocarbons

TPH (>EC8 - EC10) _{HS_1D_TOTAL}	mg/kg	0.02	MCERTS	< 0.02	< 0.02	< 0.02	< 0.02
TPH (>EC10 - EC12) _{EH_CU_1D_TOTAL}	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0
TPH (>EC10 - EC35) _{EH_CU_1D_TOTAL}	mg/kg	10	NONE	37	< 10	16	16
TPH (>EC12 - EC16) _{EH_CU_1D_TOTAL}	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0
TPH (>EC16 - EC21) _{EH_CU_1D_TOTAL}	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10
TPH (>EC21 - EC35) _{EH_CU_1D_TOTAL}	mg/kg	10	MCERTS	33	< 10	13	12
TPH Total >EC8 - EC35 _{EH_CU+HS_1D_TOTAL}	mg/kg	10	NONE	37	< 10	16	16
TPH (EC10 - EC40) _{EH_CU_1D_TOTAL}	mg/kg	10	MCERTS	39	< 10	16	16

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

Analytical Report Number : 25-037129

Project / Site name: 76a Queens Road

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

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

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
613573	BH1	None Supplied	0.5	Brown loam and sand with gravel and vegetation
613574	BH1	None Supplied	1.5	Brown loam and sand with gravel and vegetation
613575	BH3	None Supplied	0.5	Brown loam and clay with gravel and vegetation
613576	BH3	None Supplied	2.5	Brown sandy clay with gravel and vegetation

Analytical Report Number : 25-037129

Project / Site name: 76a Queens Road

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters Heating/Cooling (PrW) DI Process Water (DI PrW)

Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in Soil	Asbestos Identification with the use of polarised light microscopy in conjunction with dispersion staining techniques	In-house method based on HSG 248, 2021	A001B	D	ISO 17025
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate (Walkley Black Method)	In-house method	L009B	D	MCERTS
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode	In-house method	L010-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically (up to 30°C)	In-house method	L019B	W	NONE
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight	In-house method based on British Standard Methods and MCERTS requirements.	L019B	D	NONE
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil	L038B	D	MCERTS
Total sulphate (as SO ₄ in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES	In-house method	L038B	D	MCERTS
Sulphate, water soluble, in soil (16hr extraction)	Sulphate, water soluble, in soil (16hr extraction)	In-house method	L038B	D	MCERTS
Speciated PAHs and/or Semi-volatile organic compounds in soil	Determination of semi-volatile organic compounds (including PAH) in soil by extraction in dichloromethane and hexane followed by GC-MS	In-house method based on USEPA 8270	L064B	D	MCERTS
Total petroleum hydrocarbons by GC-FID/GC-MS HS in soil	Determination of total petroleum hydrocarbons in soil by GC-FID/GC-MS HS	In-house method	L076B/L088-PL	D/W	MCERTS
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in NaOH and addition of 1,5 diphénylcarbazide followed by colorimetry	In-house method	L080-PL	W	MCERTS
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080-PL	W	MCERTS
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080-PL	W	MCERTS
Chloride, water soluble, in soil	Determination of Chloride colorimetrically by discrete analyser	In-house method	L082B	D	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement	In-house method	L099-PL	D	MCERTS

Analytical Report Number : 25-037129

Project / Site name: 76a Queens Road

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters Heating/Cooling (PrW) DI Process Water (DI PrW)

Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Soil Descriptions	Textural classification	In-house method	L019B	W	NONE

For method numbers ending in 'UK' or 'A' analysis have been carried out in our laboratory in the United Kingdom (Watford).

For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).

For method numbers ending in 'PL' or 'B' analysis have been carried out in our laboratory in Poland.

Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Quality control parameter failure associated with individual result applies to calculated sum of individuals.

The result for sum should be interpreted with caution



Sample Deviation Report



Analytical Report Number : 25-037129

Project / Site name: 76a Queens Road

This deviation report indicates the sample and test deviations that apply to the samples submitted for analysis. Please note that the associated result(s) may be unreliable and should be interpreted with care.

Key: a - No sampling date b - Incorrect container/Insufficient material provided c - Holding time d - Headspace e - Temperature

Sample ID	Other ID	Sample Type	Lab Sample Number	Sample Deviation	Test Name	Test Ref	Test Deviation
BH1	N/A	S	613573	b	Asbestos identification in Soil	A001B	b
BH1	N/A	S	613574	b	Asbestos identification in Soil	A001B	b
BH3	N/A	S	613575	b	Asbestos identification in Soil	A001B	b
BH3	N/A	S	613576	b	Asbestos identification in Soil	A001B	b

 GEA		Geotechnical & Environmental Associates www.gea-ltd.co.uk		Generic Risk-Based Soil Screening Values																																																																																																																																																																																																																																					
Site 76a Queens Road, Caverhsam, Reading, Berkshire, RG4 8DL				Job Number J15160																																																																																																																																																																																																																																					
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<table><tr><th>Contaminant</th><th>Screening Value mg/kg</th><th>Data Source</th></tr><tr><td colspan="3">Metals</td></tr><tr><td>Arsenic</td><td>37</td><td>C4SL</td></tr><tr><td>Cadmium</td><td>22</td><td>C4SL</td></tr><tr><td>Chromium (III)</td><td>910</td><td>S4UL</td></tr><tr><td>Chromium (VI)</td><td>21</td><td>C4SL</td></tr><tr><td>Copper</td><td>2,400</td><td>S4UL</td></tr><tr><td>Lead</td><td>200</td><td>C4SL</td></tr><tr><td>Elemental Mercury</td><td>1.2</td><td>S4UL</td></tr><tr><td>Inorganic Mercury</td><td>200</td><td>C4SL</td></tr><tr><td>Nickel</td><td>130</td><td>S4UL</td></tr><tr><td>Selenium</td><td>250</td><td>S4UL</td></tr><tr><td>Zinc</td><td>3,700</td><td>S4UL</td></tr><tr><td colspan="3">Anions</td></tr><tr><td>Soluble Sulphate</td><td>500 mg/l</td><td>Structures</td></tr><tr><td>Sulphide</td><td>50</td><td>Structures</td></tr><tr><td>Chloride</td><td>400</td><td>Structures</td></tr><tr><td colspan="3">Others</td></tr><tr><td>Organic Carbon 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Notes Concentrations measured below these screening values may be considered to represent 'uncontaminated conditions' which pose a 'LOW' risk to human health. Concentrations measured in excess of these values indicate a potential risk which require further, site specific risk assessment. C4SL - Defra Category 4 Screening value based on Low Level of Toxicological Risk SGV - Soil Guideline Value, derived from the CLEA model and published by Environment Agency 2009 - where not superseded by C4SL S4UL - LQM/CIEH Suitable for use Level (2015) based on 'minimal' level of risk Calc1 - sum of thresholds for Ali & Aro fractions - assuming a 35% Aro:65% Ali ratio as is commonly encountered in the soil Calc2 - sum of nearest available carbon range specified including BTEX for PRO fraction																																																																																																																																																																																																																																									



appendix c

Desk Study

UXO Preliminary Risk Assessment

Preliminary Unexploded Ordnance (UXO) Risk Assessment

Project Name	76a Queens Road, Caversham
Client	GEA Limited
Site Address	76a Queens Road, Caversham, Reading, RG4 8DL
Report Reference	PA21679-00
Date	03/07/2025
Author	RS
Quality Assurance	AT

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1ST LINE DEFENCE



Assessment Objective

This preliminary unexploded ordnance (UXO) risk assessment is a qualitative screening exercise to assess the likely potential of encountering UXO at the 76a Queens Road, Caversham site. The assessment involves the consideration of the basic factors that affect the potential for UXO to be present at a site as outlined in Stage One of the UXO risk management process.

Background

This assessment uses the sources of information available in-house to 1st Line Defence Ltd to enable the placement of a development site in context with events that may have led to the presence of German air-delivered or Allied military UXO. The report will identify any immediate necessity for risk mitigation or additional research in the form of a Detailed UXO Risk Assessment. It makes use of 1st Line Defence's extensive historical archives, library and unique geo-databases, as well as internet resources, and is researched and compiled by UXO specialists and graduate researchers.

The assessment directly follows CIRIA C681 guidelines "Unexploded Ordnance, a Guide for the Construction Industry". The document will therefore assess the following factors:

- Basic Site Data
- Previous Military Use
- Indicators of potential aerial delivered UXO threat
- Consideration of any Mitigating Factors
- Extent of Proposed Intrusive Works
- Any requirement for Further Work

It should be noted that the vast majority of construction sites in the UK will have a low or negligible risk of encountering UXO and should be able to be screened out at this preliminary stage. The report is meant as a common sense 'first step' in the UXO risk management process. The content of the report and conclusions drawn are based on basic, preliminary research using the information available to 1st Line Defence at the time this report was produced. It should be noted that the only way to entirely negate risk from UXO to a project would be to support the works proposed with appropriate UXO risk mitigation measures. It is rarely possible to state that there is absolutely 'no' risk from UXO to a project.

Site Boundary



Risk Assessment Considerations	
Site location and description/current use	The site is located in Caversham, Reading. According to recent aerial imagery, the site is currently occupied by a structure and vegetated ground. Residential properties and their associated gardens border north, east and west of the site with Queens Road bordering south of the site. The site is approximately centred on the OS grid reference: SU 72084 74464.
Are there any indicators of current/historical military activity on/close to the site?	In-house records do not indicate that the site footprint had any former military use. No features such as WWII defensive positions, encampments or firing ranges are recorded to have been located at or in the immediate vicinity of the site. In addition, no information of ordnance being stored, produced, or disposed of within the proposed site boundary could be found. The closest Heavy Anti-Aircraft (HAA) battery was positioned approximately 4.5km west of the site. The range of a fired projectile can be up to 15km. The conditions in which unexploded anti-aircraft ordnance may have fallen unrecorded are analogous to that of aerial delivered German bombs.
What was the pre- and post-WWII history of the site?	Pre-WWII OS mapping dated 1932 indicates that the site was occupied by a structure and a relatively small area of undeveloped ground. Residential properties and their associated gardens border north, east and west of the site with <i>Queen's Road</i> to the south of the site. Post-WWII OS mapping dated 1956 does not indicate any significant developments on or within the surrounding area from the site when compared with 1932 OS mapping.
Was the area subject to bombing during WWII?	During WWII, the site was situated within the County Borough of Reading. According to official Home Office bombing statistics, this district sustained an overall very low density of bombing with an average of 0.5 items dropped per 1,000 acres. This consisted of five high explosive (HE) bombs across 9,105 acres. Four of these bombs were dropped on the 10th February 1943 and struck Friar Street, The People's Pantry and Minster Street in Reading town centre. The location of the fifth bomb in the borough is unclear, but it is thought unlikely to have fallen near the site.
Is there any evidence of bomb damage on/close to the site?	Low-resolution 1944 aerial photography does not indicate any distinct signs of damage on or within close proximity to the site.
To what degree would the site have been subject to access?	Given that the site was occupied and surrounded by structures, access is considered to have been frequent throughout WWII.
To what degree has the site been developed post-WWII?	According to recent aerial imagery, no significant developments have taken place on site post WWII.
What is the nature and extent of the intrusive works proposed?	The nature and extent of works proposed was not available at the time of writing.

Summary and Conclusions

During WWII, the site was situated within the County Borough of Reading. According to official Home Office bombing statistics, this district sustained an overall very low density of bombing with just five HE bombs recorded across the district.

Four of these bombs were dropped on the 10th February 1943 and struck Friar Street, The People's Pantry and Minster Street in Reading town centre. The location of the fifth bomb in the borough is unclear, but it is thought unlikely to have fallen near the site.

Given the lack of positive evidence of bombing in the area, as well as developed nature of the site and surrounding area, there is not considered to be an increased risk of UXO on site.

Recommendations

Given the findings of this preliminary report, the risk of UXO contamination is not considered to be above the 'background risk' for this area and it is not thought likely that additional research, in the form of a Detailed UXO Risk Assessment, would significantly alter the findings of this report. It is therefore recommended that **no further action** is taken.

If the client has any anecdotal or empirical evidence of UXO risk on site, please contact 1st Line Defence.

It should be noted that although the risk from unexploded ordnance on this site has been assessed as low/minimal, this does not mean there is 'no' risk of encountering UXO. This preliminary report has been undertaken with due diligence, and all reasonable care has been taken to access and analyse relevant historical information. By necessity, when dealing with historical evidence, and when making assessments of UXO risk, various assumptions have to be made which we have discussed and justified within this report. Our reports take a common-sense and practical approach to the assessment of UXO risk, and we strive to be reasonable and pragmatic in our conclusions. As referenced, it would be possible to undertake further research into this site, but based on the evidence to hand, this is not deemed strictly necessary, and no reasonably justifiable requirement for proactive on-site mitigation has been identified.

It should however be stressed that if any suspect items are encountered during the proposed works, 1st Line Defence should be contacted for advice/assistance, and to re-assess the risk as necessary. Furthermore, we would recommend that ground personnel are always made aware of the potential for encountering UXO, what to look out for and what to do in the unlikely event that a suspect item is encountered, and that a UXO Risk Management Plan is put together for the proposed works. We would be happy to provide a template and guidance for this – contact us on 01992 245020. Should the scope of works change or additional works be proposed, 1st Line Defence should be contacted to re-evaluate the risk.

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