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Your Ref:

Our Ref:

**Ref: 16/24927A**
**May 2016**
***Revised October 2021***

# 115 – 119 GOLDHURST TERRACE,

# LONDON, NW6 3EY

## REPORT ON A GROUND INVESTIGATION

**Prepared for**

**Elliott Wood Partnership LLP**

**Acting on behalf of**

**Hive 1 Limited**

## CONTENTS

# 1.0 INTRODUCTION

## 1.1 Outline and Limitations of Report

At the request of Elliott Wood Partnership LLP, working on behalf of Hive 1 Limited, a ground investigation was carried out in connection with a proposed residential basement development at the above site. A Phase 1 Preliminary Risk Assessment (Desk Study) is presented under separate cover in Site Analytical Services Limited Report Reference 16/24927-1.

The information was required for the design and construction of foundations and infrastructure for the proposed development at the existing site. Information was also required to assess whether any remediation was required for the protection of the end-user from the presence of potential contamination within the soils encountered.

The recommendations and comments given in this report are based on the ground conditions encountered in the exploratory holes made during the investigation and the results of the tests made in the field and the laboratory. It must be noted that there may be special conditions prevailing at the site remote from the exploratory hole locations which have not been disclosed by the investigation and which have not been taken into account in the report. No liability can be accepted for any such conditions.

## 1.2 Remit and Approach

Environmental assessors use a source-pathway-receptor conceptual site model when determining the risk posed by potentially contaminated sites. For potential risk to arise each stage of the SPR linkage must be present, plausible and significant.

# 2.0 SITE DETAILS

**(National Grid Reference: TQ260841)**

## 2.1 Site Location

115-119 Goldhurst Terrace is a block of residential properties, located on the eastern side of Goldhurst Terrace, Camden at approximate postcode NW6 3EY. The residential property has four levels of accommodation; ground, first, second and third floor. Balconies are present on the ground and second floor of the property with the site also comprises a communal front and rear garden.

The site covers an approximate area of 0.06 Hectares with the general area being under the authority of the London Borough of Camden.

The site is located on the eastern side of Goldhurst Terrace with residential properties to the north, east, west and south.

## 2.2 Geology

The 1:50000 Geological Survey of Great Britain (England and Wales) covering the area (Sheet 256, 'North London', Solid and Drift Edition) indicates the site to be underlain by the London Clay Formation at depth.

The British Geological Survey maintains an archive of historical exploratory borehole logs throughout the UK. SAS Limited has searched the database and have found that there are no boreholes located within 100m of the site.

## 2.3 Previous Investigations

A Phase 1 Preliminary Risk Assessment (PRA) (SAS Report Ref: 16/24927-1 dated May 2016) has been undertaken across the site by Site Analytical Services Limited.

# 3.0 SCOPE OF WORK

## 3.1 Site Works

The exploratory investigation included for an inspection of the site and near surface soils in order to:-

- Determine the presence, extent and significance of potential contaminants in the sub-surface strata associated with current and former activities at the site and surrounds identified during the Phase 1 PRA.
- Assess the significance of potential impacts on sensitive receptors at or adjacent to the site.
- Assess the potential environmental liabilities and consequences associated with the site.
- Identify requirements for further works, including the design of any additional investigative/monitoring works and remedial measures if deemed necessary.

The proposed scope of works was agreed by the client prior to the commencement of the investigations. To achieve this, the following works were undertaken:-

- The drilling of one rotary percussive borehole to a depth of 20.00m below ground level (Borehole 1).
- The drilling of two continuous flight auger boreholes to a depth of 5.00m below ground level (WS1 and WS2).
- The excavation of seven trial pits to 1.50m maximum depth to expose existing foundations at the site (Trial Pits 2 to 8 inclusive).

- The excavation of three trial pits to 1.00m maximum depth to obtain contamination samples from site (Trial Pits 9, 10 and 11).
- Sampling and in-situ testing as appropriate to the ground conditions encountered in the boreholes and trial pit.
- Laboratory testing to determine the engineering properties of the soils encountered in the exploratory holes.
- Factual reporting on the results of the investigation, with comments on the contamination test results.

## 3.2 Ground Conditions

The locations of the exploratory holes are shown on the site sketch plan, Figure 1.

The boreholes revealed ground conditions that were consistent with the geological records and known history of the area and comprised Made Ground up to 1.50m in thickness resting on deposits of the London Clay Formation.

These ground conditions are summarised in the following table. For detailed information on the ground conditions encountered in the boreholes and trial pits, reference should be made to the exploratory hole records presented in Appendix A.

| Strata | Depth to top of strata (mbgl) | Level to top of strata (mOD) | Depth to base of strata (mbgl) | Level to base of strata (mOD) | Description |
|---|---|---|---|---|---|
| Made Ground | 0.00 | 39.30 to 38.84 | 0.58 to 1.50 | 38.63 to 37.48 | Grass surface over clayey sand with brick fragments. |
| London Clay Formation | 8.00 to 20.00 | 38.08 to 37.74 | 20.00 (base of BH 1) | 18.84 | Stiff becoming very stiff silty sandy clay with gypsum crystals |

**Table A: Summary of Ground Conditions in Exploratory Holes**

## 3.3 Groundwater

Groundwater was not encountered within the boreholes or trial pits and the soils remained essentially dry throughout.

It must be noted that the speed of excavation is such that there may well be insufficient time for further light seepages of groundwater to enter the boreholes and trial pits and hence be detected, particularly within more cohesive soils.

Isolated pockets of groundwater may also be present perched within any less permeable material found at shallower depth on other parts of the site especially within any Made Ground.

Groundwater was not subsequently encountered within the monitoring standpipe within Borehole 1, but was encountered at respective depths of 1.04 and 1.05 within the standpipes in WS1 and WS2 after a period of approximately six weeks.

It should be noted that the comments on groundwater conditions are based on observations made at the time of the investigation (March and April 2016) and that changes in the groundwater level could occur due to seasonal effects and also changes in drainage conditions.

## 4.0 IN-SITU TESTING AND LABORATORY TESTS

### 4.1 Standard Penetration Tests

The results of the Standard Penetration Tests carried out in the natural soils are shown on the exploratory hole records in Appendix A.

### 4.2 Undrained Triaxial Compression Test Results

Undrained Triaxial Compression tests were carried out on seven undisturbed 100mm diameter samples taken from within Borehole 1.

The results of the tests are given within Table 1, contained in Appendix B

### 4.3 Hand Vane Tests

In the essentially cohesive natural soils encountered at the site, in-situ shear vane tests were made at regular depth increments in order to assess the undrained shear strength of the materials. The results indicate that the natural soils are of a generally high strength in accordance with BS 5930 (2015).

The results of the in-situ tests are shown on the appropriate exploratory hole records contained in Appendix A.

### 4.4 Classification Tests

Atterberg Limit tests were conducted on three samples taken at depth in Borehole 1 and WS1 and WS2 and showed the samples tested to fall into Class CH according to the British Soil Classification System.

The test results are given in Table 2, contained in Appendix B.

### 4.5 Sulphate and pH Analyses

The results of the sulphate and pH analyses made on four samples are given within i2 Analytical Limited Report Number 16-14309, contained in Appendix B.

## 5.0 CONTAMINATION TESTING

### 5.1 Exploratory Hole Locations

The sampling strategy employed during the intrusive investigation was designed to provide coverage across the site, particularly in areas of potential concern.

A selection of samples submitted for a broad screen of total potential contaminants, including those potential contaminants of concern on-site.

A total of six locations have been excavated at the site providing a density equivalent to a circa 25m grid. The trial holes were sited in order to provide a comprehensive site wide coverage as detailed in Table B.

**Table B : Summary of Exploratory Hole Sites**

| Site Area / Activity | Exploratory Hole Location(s) | Surface |
|---|---|---|
| General site coverage where Made Ground of unknown origin is anticipated. | BH1, WS1 and WS2<br>TP9, TP10 and TP11 | Grass / open land |

Samples were obtained from 0.25m in BH1, TP11 and WS1, from 0.50m in TP9, TP10 and WS2 and from 1.00m in WS2 made at the locations indicated on the site sketch plan (Figure 1). Samples were analysed from this depth range below ground level as it is felt that these soils will be representative of those of highest end-user exposure through the dermal contact, dust inhalation and soil ingestion pathways.

A sample from 1.00m in WS2 was also taken for Waste Acceptance Criteria Analysis in order to help classify soils for disposal off site.

### 5.2 Interpretation of Findings

The hazard caused by the presence of a substance or element is not absolute but depends on the proposed end use of the site.

It is understood that the site is to be developed for residential use with areas of private garden. As such the S4UL screening levels for residential use with home-grown produce and Category 4 Screening Level for residential use have been used in the following soil assessment.

Site data has been assessed against current generic assessment criteria (GAC) / guideline values in accordance with current industry practice and statutory guidance; chemical

toxicology (TOX), Soil Guideline Value (SGV) reports developed using the new Contaminated Land Exposure Assessment (CLEAv1.06) framework, CLR 11 (Environment Agency, 2009) and SP1010: Development of Category 4 screening levels for assessment of land affected by contamination (DEFRA, 2014).

However, it must be remembered that GAC are not binding standards but can be useful in forming judgements regarding the level of risk i.e. unacceptable or acceptable. Exceedance of GAC does not automatically result in the requirement for remedial / risk management work but would warrant further assessment.

### 5.3 Suitable 4 Use Levels, Category 4 Screening Levels, Soil Guideline Values, CLR Documents & Chartered Institute of Environmental Health Values

Under Part 2A of the Environmental Protection Act 1990, land is determined as contaminated if it is deemed to be causing significant harm, or where there is a Significant Possibility of Significant Harm to human health.

From January 2009 revised Soil Guidance Values for certain contaminants were issued in the Contaminated Land Reports (CLR) by the Environment Agency in conjunction with Department of the Environment, Food, Agriculture and Rural Affairs. These values and the CLEA methodology used to derive them have superseded CLEA and TOX reports for soil contaminants.

The CLR Documents are a series of contaminated land guidance documents developed by various past and present government agencies involved with protection of the environment.

These documents aim to provide a set of generic Soil Guideline Values and a site specific modelling programme based upon tolerable predicted uptakes from experimental data for a variety of common industrial toxic contaminants. In instances of carcinogenic and mutanagenic substances the guideline values are set on the basis of "As Low As Reasonably Practicable" (ALARP), as theoretically mutation can occur on exposure to a single particle of the contaminant.

Revised Statutory Guidance to support Part 2A of the Environmental Protection Act 1990 was published in April 2012, which introduced a new four-category system for classifying land under Part 2A for cases of a Significant Possibility of Significant Harm to human health, where Category 1 includes land where the level of risk is clearly unacceptable and Category 4 includes land where the level of risk posed is acceptably low.

‘Category 4 Screening Levels’ (C4SLs) have been introduced in March 2014 to provide a simple test for deciding when land is suitable for use and definitely not contaminated land. The Category 4 Screening Levels consist of estimates of contaminant concentrations in soil that are considered to present an ‘acceptable’ level of risk, within the context of Part 2A.

In response, in November 2014, The Chartered Institute of Environmental Health Generic Assessment Criteria for Human Health Risk Assessment adopt the Environment Agency’s CLEA UK (Beta) Model and Category 4 Screening Levels and as such have derived guideline values that are compatible with current English legislation, policy and technical guidance in the form of LQM/CIEH S4ULS’s (Suitable 4 Use Levels).

The methodology for deriving both the previous Soil Guideline Values and the new Suitable 4 Use Levels is based on the Environment Agency's Contaminated Land Exposure Assessment (CLEA) methodology.

At the time of writing this report Suitable 4 Use Levels are in place for some heavy metals, BTEX Substances, Petroleum Hydrocarbons and Polycyclic Aromatic Hydrocarbons as well as a number of selected organic compounds.

Generic Assessment Criteria for Human Health Risk Assessment (S4UL's) have been produced by LQM / Chartered Institute of Environmental Health for a residential use with home grown produce. These are Arsenic 37mg/kg, Beryllium 1.7mg/kg, Boron 290mg/kg, Cadmium 11mg/kg, Trivalent Chromium (Chromium III) 910mg/kg, Hexavalent Chromium (Chromium VI) 6mg/kg, Copper 2400mg/kg, Mercury (Elemental) 1.2mg/kg, Mercury (Inorganic) 40mg/kg, Methylmercury 11mg/kg, Nickel 180mg/kg, Selenium 250mg/kg, Vanadium 410mg/kg, Zinc 3700mg/kg, Benzene (2.5% SOM) 0.17mg/kg, Toluene (2.5% SOM) 290mg/kg, Ethylbenzene (2.5% SOM) 110mg/kg, Xylenes (2.5% SOM) from 130mg/kg and Phenols (2.5% SOM) 550mg/kg.

As no generic UK derived guidance is currently available for acceptable concentrations of Total Lead, the Category 4 Screening Level for residential use with home-grown produce of 200mg/kg has been used to identify where potential risks may exist.

The Environment Agency has released the CLEA software and its handbook to help assessors estimate risks. The Chartered Institute of Environmental Health Generic Assessment Criteria for Human Health Risk Assessment (S4UL's) adopt the Environment Agency's CLEA UK (Beta) Model and as such have derived guideline values that are compatible with current English legislation, policy and technical guidance.

Assessment criteria (S4UL's) for selected individual Polycyclic Aromatic Hydrocarbons have been produced by Chartered Institute of Environmental Health; however no values have been attached to Total Polycyclic Aromatic Hydrocarbons. Sixteen individual Polycyclic Aromatic Hydrocarbons with attached screening values include Benzo(a)anthracene 7.2-13mg/kg, Benzo(a)pyrene 2.2-3.0mg/kg, Dibenzo(a,h)anthracene (0.24-0.30mg/kg) and Naphthalene (2.3-13mg/kg) for a residential scenario with home grown produce.

The concentrations of Total Petroleum Hydrocarbons have been assessed against assessment criteria (S4UL's) for individual Aromatic and Aliphatic carbon band ranges produced by Chartered Institute of Environmental Health for a residential scenario with home grown produce.

As no generic UK derived guidance is currently available for acceptable concentrations of Total Cyanide a screening value of 20mg/kg (Thiocyanate) has been used as a preliminary screening tool to identify where potential risks may exist.

As described in Using Soil Guideline Values – Environment Agency 2009, chemical data from the analysis of samples generated during the intrusive investigation have been used to create a data set for the site. The entire data set, as opposed to individual results has been analysed on the assumption that the samples from the site investigation are to some degree representative of the contaminant concentration throughout the area or volume of soil investigated. The most appropriate method for assessing a given dataset is dependent upon a range of specific factors together with the quantity and quality of the data generated.

In accordance with the recommendations provided within Guidance on comparing soil contamination data with a critical concentration – CIEH/CL:AIRE, 2008, we have selected the

one sample t-test at a 95% confidence level as the most appropriate statistical tool for generating site representative soil concentration values and have assumed that the data is normally distributed. We have assumed that this statistical test is required to draw conclusions about the condition of the land under scrutiny as part of a planning scenario as opposed to the Part 2A scenario. Under a planning scenario, comparison is made between a value larger than the sample mean, in this case the Upper Confidence Limit and the critical concentration.

In instances where the Upper Confidence Limit exceeded the given critical value, then the Grubbs Test has been used to identify upper outliers to assess whether the highest value belongs to the general population of the dataset or is representative of an outlier.

## 5.4 Assessment of Soil Analyses

It is understood that the site is to be developed for residential use with areas of private garden. As such the S4UL screening levels for residential use with home-grown produce and Category 4 Screening Level for residential use have been used in the following soil assessment. The samples selected for contamination assessment were sub-contracted to i2 Analytical Limited and QTS Environmental Limited (both UKAS and MCERTS accredited laboratories) and their reports are contained in Appendix B.

## 5.5 Discussion

### 5.5.1 Human health risk assessment (on site residents and neighbouring residents)

Concentrations of the zootoxic heavy metals Total Arsenic, Total Boron, Total Cadmium, Hexavalent Chromium, Trivalent Chromium, Total Mercury, Total Selenium, Total Copper, Total Nickel and Total Zinc in the samples analysed did not exceed the S4UL Generic Guideline Values for a residential scenario with home-grown produce. As such there is not considered to be any potentially significant level of end-user risk associated with the concentrations of these contaminants encountered.

The concentrations of Total Lead encountered in the samples from 0.25m in BH1 at 440mg/kg, 0.50m in TP9 at 1200mg/kg, 0.50m in TP10 at 1100mg/kg, 0.25m in TP11 at 390mg/kg, 0.25m in WS1 at 700mg/kg and 0.50m in WS2 at 830mg/kg in excess of the Category 4 Screening Level for residential use with home-grown produce of 200mg/kg. It was therefore decided to undertake statistical analysis of the data set, using the arithmetic mean and standard deviation for Lead. Following a test scenario from a planning perspective, it was concluded that the true mean of the sample population was in excess of the Category 4 Screening Level for residential use with home-grown produce of 200mg/kg and as such, the potential risks to end-users of the site cannot be discounted at this stage.

The concentrations of Total Cyanide were below the screening value of 20mg/kg and the concentrations of Total Phenol were below the S4UL Generic Guideline Value for a residential scenario with home-grown produce and as such there are not considered to be any significant risks to end-users of the site from these contaminants.

Elevated concentrations of Polycyclic Aromatic Hydrocarbons including Benzo(b)fluoranthene, Benzo(a)pyrene and Dibenz(a,h)anthracene were encountered in the sample from Trial Pit 10, in excess of the respective S4UL Generic Guideline Values for a residential scenario with home-grown produce at 2.5% SOM content. It was therefore decided to undertake statistical analysis of the data set, using the arithmetic mean and standard deviation for Benzo(b)fluoranthene,

Benzo(a)pyrene and Dibenz(a,h)anthracene. Following a test scenario from a planning perspective, it was concluded that the true mean of the sample population was in excess of the S4UL Generic Guideline Values for a residential scenario with home-grown. As such the potential risks to end-users of the site cannot be discounted at this stage.

The concentrations of Petroleum Hydrocarbons encountered within individual Aromatic and Aliphatic carbon band ranges in the samples analysed did not exceed the S4UL Generic Guideline Values for a residential scenario with home-grown produce. As such there is not considered to be any potentially significant level of end-user risk associated with the concentrations of these contaminants encountered.

The concentrations of Benzene Toluene, Ethylbenzene and Xylenes encountered did not exceed the S4UL Screening Levels for residential use with home grown produce. As such there is not considered to be any potentially significant level of end-user risk associated with the concentrations of these contaminants encountered.

There was no MTBE detected within the samples analysed.

### 5.5.2 Asbestos Containing Materials

The Made Ground at each exploratory location was screened for the presence of asbestos containing material. Asbestos containing material was not observed during the investigation or identified during the laboratory analysis.

### 5.5.3 Landscape Planting

The concentrations of the phytotoxic substances Total Copper, Total Zinc and Boron encountered in the samples obtained were below S4UL Generic Guideline Values for residential use with home-grown produce and are not considered to be a significant risk to human health on-site.

However, the true mean of the sample population ($UCL_{95}$) for Total Zinc remained above the landscape planting generic assessment level of 300mg/kg and therefore may potentially affect sensitive plant species on site.

Zinc will become increasingly less available for plant uptake with increasing soil pH, such that at the inherent alkaline soil reaction (mean pH for the made ground of 8.6) uptake will be somewhat inhibited.

Although the Made Ground would be considered as a potential risk to landscape planting, the presence of hardstanding would negate any risk across the majority of the site. Where present on-site, it is recommended that remediation be undertaken in areas of landscape planting on-site.

### 5.5.4 Buildings and Construction Materials

Concrete Cast In-Situ

The range of concentrations of water soluble sulphate within the Made Ground at the site were within BRE (2005) Design Class DS-3 for concrete cast in-situ. This should be taken into

account should any concrete structures be installed within the soils represented by these samples.

**Potable Water Supply Pipes**

If at any point in the future it be intended to install new water supply pipes within the Made Ground then consideration to the pipe materials used and/or the trench construction in accordance with UKWIR (2010). Based upon the analysis undertaken, the concentrations of TPH returned by several of the samples of Made Ground may preclude the use of standard PE pipe materials at the site.

## 5.6 Waste Acceptance Criteria Analysis

All samples from the site were analysed using the 'Catwastesoil' assessment tool, which concluded the samples from 0.50m in Trial Pit 9 and from 0.50m in Trial Pit 10 were hazardous in nature. The samples from the remainder of the site were not hazardous.

A sample of soil (WS2 @ 1.00m) was analysed for Waste Acceptance Criteria Testing in order to classify soils for disposal purposes.

For the purpose of waste disposal, the soil sample analysed would be classified as follows:

*WS2 @ 1.00m* *Inert Waste*

The concentration of Sulphate encountered was in excess of the Upper Acceptance Limits for Inert waste, however when TDS was used instead the sample would be classified as Inert Waste.

Whilst the sample analysed for Waste Acceptance Criteria (WAC) at the WS2 location was Inert waste, Made Ground in the TP9 and 10 locations on-site will likely be Stable Non-reactive Hazardous Waste.

## 5.7 Trees

Attention is drawn to the presence of large mature trees with Tree Protection Orders within the site boundary – at the front of the site in the north-west corner. Soil excavation and replacement within the Root Protection Zones of retained trees will be damaging to these trees.

It is considered that due to:

- The small portion of soft landscaping within the tree protection zones and
- The remediation of the remainder of soft landscaped and gardens areas on site,

that a reduced scheme of remediation would be suitable in the Root Protection Zones of these trees. The recommended remediation in this area would be the placement of a no-dig geotextile membrane with a reduced cover layer of 300mm of clean imported topsoil.

## 5.8 Conclusions

The findings of the Phase 2 site investigation have demonstrated that in the context of a proposed residential use with home-grown produce, the contaminants of concern with respect to end-user protection were elevated Lead contamination across the site and elevated Polycyclic Aromatic Hydrocarbons including Benzo(b)fluoranthene, Benzo(a)pyrene and Dibenz(a,h)anthracene encountered on-site, with the critical receptors being the end-users and residents of the site, adjacent residents and site construction workers.

## 5.9 Revised Site Conceptual Model (CSM)

A Phase 2 Site Investigation has identified the following Source/Pathway/receptor linkages present on-site or potentially present – presented in the revised site conceptual model below:

| Potential Contaminants/ Source | Pathway | Receptor | Site specific settings | Risk Classification: Based on Phase II Investigation | Action Required |
|---|---|---|---|---|---|
| *LEAD, PAH* | Inhalation, ingestion and dermal contact. | Human Health Residents | Residential use with gardens | Low/Medium | Further action required – Soil Remediation required |
| *LEAD, PAH* | Inhalation, ingestion and dermal contact | Human Health Workers | Workers and the general public should follow regulation on health and safety during development (HSE, 1991). | Low | Further action required – Soil Remediation required |
| *NO SOURCES* | Through high permeability strata, fissures and shafts, and by Inhalation by humans | Human Health Inhalation of vapours | Volatile Hydrocarbon or volatile PAH contamination was not detected on site. Made ground on site was not excessively deep. | None | No further action |
| *NO SOURCES* | Negligible groundwater flow | Shallow groundwater/ Surface Water | Unproductive Strata underlying the site. | None | No further action |
| *LEAD, PAH* | Negligible groundwater flow | Deep groundwater | Unproductive Strata underlying the site. | None | No further action |
| *TPH* | Chemical attack, gas accumulation in buildings | Building structures/services | Potential for small amount of Made Ground | Low/Medium | Barrier pipe recommended for potable water pipes. |

| | | | | | |
|---|---|---|---|---|---|
| *ZINC* | Uptake (root and stomata), ingestion, inhalation and dermal absorption by animal) | Ecological features (i.e. Flora and Fauna) | There are no significant sensitive land uses within 250m of the site. However, there are areas of soft landscaping proposed on site. | Low | Further action required – Soil Remediation required |

There remains the potential for some level of end-user risk posed by the concentrations of contaminants encountered. It is anticipated that the protection of the end-user may be achieved by the following:

**Areas of proposed hardstanding (e.g. building footprint, roadways etc.)**

In areas of permanent hardstanding such as the building footprint and roadways etc., the development itself would adequately break exposure pathways to human health and therefore further remedial measures may not be required in these areas.

**Sensitive end use areas (soft-landscaping etc.)**

A proposed site plan (ground floor and landscaping layout) is presented below in Figure 1.

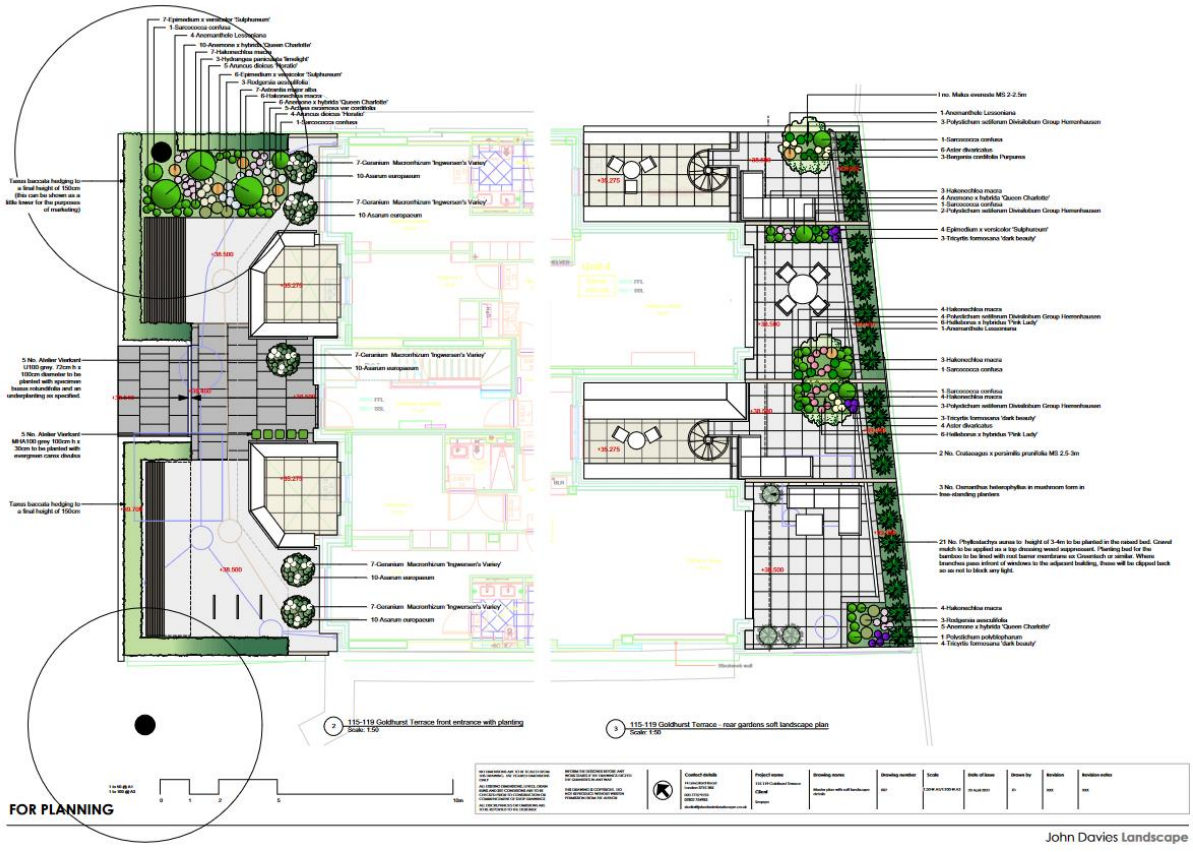



***Figure 1 – Proposed Ground Floor and Landscaping Layout***

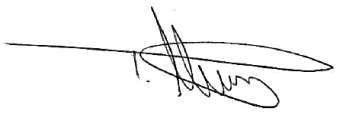
In areas of sensitive end use such as soft-landscaping etc. soils should be removed from the site to mitigate the risks to end-users and break exposure pathways. It would be recommended that the soils be excavated down to at least 600mm and replaced with a clean cohesive fill material of at least 600mm.

For soils within the Root Protection Zones of trees on site with Tree Protection Orders, the recommended remediation is the placement of a no-dig geotextile membrane with a reduced cover layer of 300mm of clean imported topsoil.

Any materials brought onto the site (soils and / or clay) should be validated either at source or once laid at site. Given the nature of the ground conditions, appropriate health and safety practices should be adhered to in order to protect site workers. Any waste material leaving site for off-site disposal (soil and / or water) should be handled in accordance with the current Waste Management and Duty of Care Regulations.

The above conclusions have been drawn on the results of the tests carried out on the soil samples analysed and address remediation issues for the protection of the end-user only. It is recommended that any remedial measures suggested in this report should be subject to formal approval by local Environmental Health and/or Planning Departments and approval should be obtained prior to any works being undertaken. The comments made in this report do not address any third party liability.

**p.p. SITE ANALYTICAL SERVICES LIMITED**



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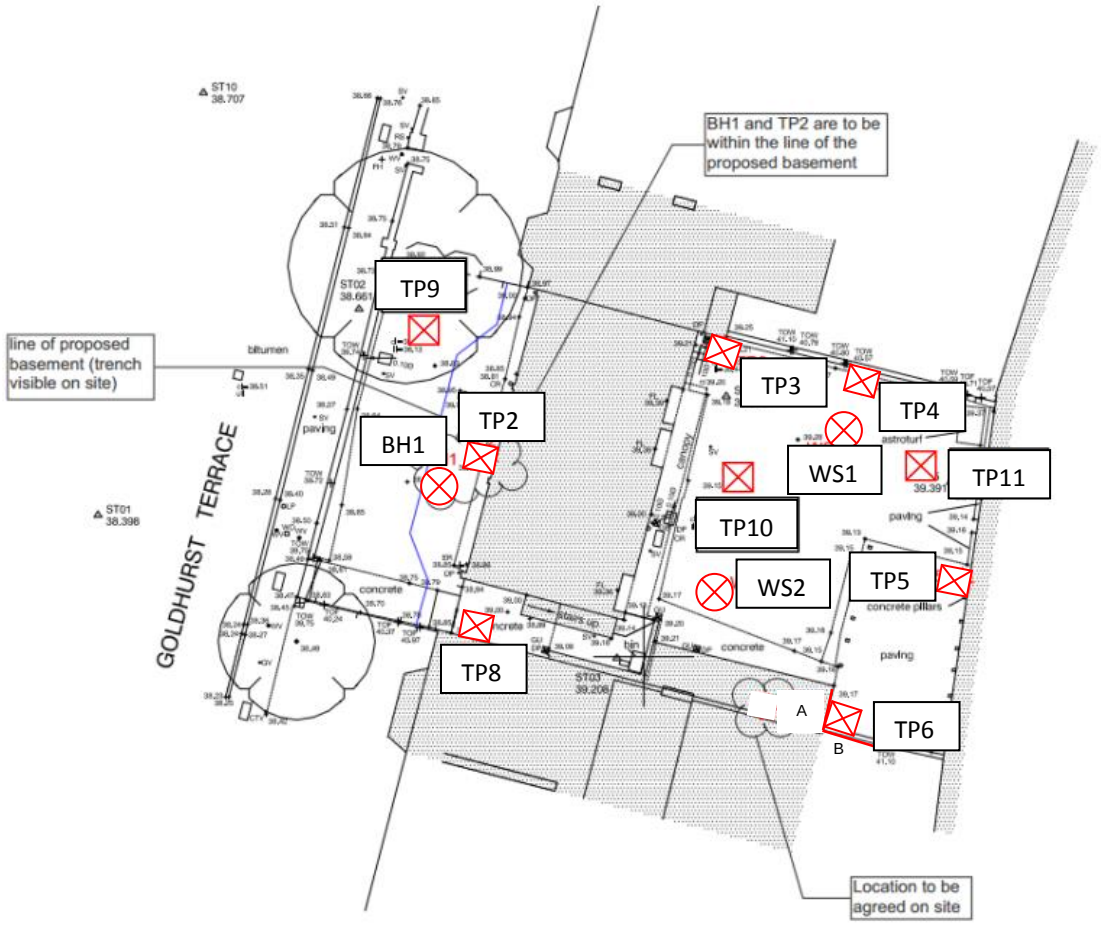
| | | |
|---|---|---|
| Site Analytical Services Ltd. | | REF: 16/24927 |
| LOCATION: | 115-119 Goldhurst Terrace, London, NW6 3HR | FIG: 1 |
| TITLE: Site Sketch Plan | DATE: April 2016 | SCALE: NTS |



# APPENDIX `A'

## Borehole / Trial Pit Logs

# Site Analytical Services Ltd.

| Site | Borehole Number |
|---|---|
| 115-119 GOLDHURST TERRACE,LONDON,NW6 3HR | BH1 |

| Boring Method | Casing Diameter | Ground Level (mOD) | Client | Job Number |
|---|---|---|---|---|
| ROTARY PERCUSSIVE | 128mm cased to 0.00m | 38.84 | HIVE 1 LIMITED | 1624927 |
| | **Location** | **Dates** | **Engineer** | **Sheet** |
| | TQ260841 | 15/03/2016 | ELLIOTT WOOD PARTNERSHIP LLP | 1/2 |

| Depth (m) | Sample / Tests | Casing Depth (m) | Water Depth (m) | Field Records | Level (mOD) | Depth (m) (Thickness) | Description | Legend | Water |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | 38.74 | 0.10 | MADE GROUND: Grass over topsoil | | |
| 0.25 | D1 | | | | | | MADE GROUND: Loose, dark brown clayey sand with fragments of brick and concrete rubble | | |
| 0.50 | D2 | | | | | (1.00) | | | |
| 0.75 | D3 | | | | | | | | |
| 1.00-1.45 | SPT(C) N=11 | | DRY | 1,2/3,3,3,2 | 37.74 | 1.10 | Stiff, mottled brown light grey blue silty sandy CLAY with occasional gypsum crystals | | |
| 1.00 | D4 | | | | | | | | |
| 1.75 | D5 | | | | | | | | |
| 2.00-2.45 | U1 65 | | | | | | | | |
| 2.75 | D6 | | | | | | | | |
| 3.00-3.45 | SPT N=18 | | DRY | 2,3/4,4,5,5 | | | | | |
| 3.00 | D7 | | | | | | | | |
| 3.75 | D8 | | | | | | | | |
| 4.00-4.45 | U2 80 | | | | | | | | |
| 4.75 | D9 | | | | | | | | |
| 5.00-5.45 | SPT N=22 | | DRY | 4,5/6,5,5,6 | | | | | |
| 5.00 | D10 | | | | | (8.50) | | | |
| 6.00 | D11 | | | | | | | | |
| 6.50-6.95 | U3 90 | | | | | | | | |
| 7.50 | D12 | | | | | | | | |
| 8.00-8.45 | SPT N=30 | | DRY | 6,7/7,8,7,8 | | | | | |
| 8.00 | D13 | | | | | | | | |
| 9.00 | D14 | | | | | | | | |
| 9.50-9.95 | U4 110 | | | | 29.24 | 9.60 | Stiff becoming very stiff, dark grey blue silty sandy fissured CLAY with occasional gypsum crystals | | |
| | | | | | | (0.40) | | | |

**Remarks**
D= Disturbed Sample
U= Undisturbed 100mm Diameter Sample
C= Dynamice Penetration Test - Cone
S= Standard Penetration Test - Cone
Groundwater was not encountered during boring/excavation
Excavating from 0.00m to 1.00m for 1 hour.

| Scale (approx) | Logged By |
|---|---|
| 1:50 | EW |

**Figure No.** 1624927.BH1

# Site Analytical Services Ltd.

| Site | Borehole Number |
|---|---|
| 115-119 GOLDHURST TERRACE,LONDON,NW6 3HR | BH1 |

| Boring Method | Casing Diameter | Ground Level (mOD) | Client | Job Number |
|---|---|---|---|---|
| ROTARY PERCUSSIVE | 128mm cased to 0.00m | 38.84 | HIVE 1 LIMITED | 1624927 |
| | **Location** | **Dates** | **Engineer** | **Sheet** |
| | TQ260841 | 15/03/2016 | ELLIOTT WOOD PARTNERSHIP LLP | 2/2 |

| Depth (m) | Sample / Tests | Casing Depth (m) | Water Depth (m) | Field Records | Level (mOD) | Depth (m) (Thickness) | Description | Legend | Water |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | 28.84 | 10.00 | Stiff becoming very stiff, dark grey blue silty sandy fissured CLAY with occasional gypsum crystals | | |
| 10.50 | D15 | | | | | | | | |
| 11.00-11.45<br>11.00 | SPT N=33<br>D16 | | DRY | 8,7/8,8,9,9,8 | | | | | |
| 12.00 | D17 | | | | | | | | |
| 12.50-12.95 | U5 130 | | | | | | | | |
| 13.50 | D18 | | | | | | | | |
| 14.00-14.45<br>14.00 | SPT N=49<br>D19 | | DRY | 9,10/11,13,12,13 | | | | | |
| 15.00 | D20 | | | | | (10.00) | | | |
| 15.50-15.95 | U6 160 | | | | | | | | |
| 16.50 | D21 | | | | | | | | |
| 17.00-17.45<br>17.00 | SPT N=56<br>D22 | | DRY | 12,13/13,14,14,15 | | | | | |
| 18.00 | D23 | | | | | | | | |
| 18.50-18.95 | U7 180 | | | | | | | | |
| 19.25 | D24 | | | | | | | | |
| 19.55-20.00<br>19.55 | SPT N=58<br>D25 | | DRY | 9,13/14,15,14,15 | 18.84 | 20.00 | | | |

**Remarks**
D= Disturbed Sample
U= Undisturbed 100mm Diameter Sample
C= Dynamice Penetration Test - Cone
S= Standard Penetration Test - Cone
Groundwater was not encountered during boring/excavation

| Scale (approx) | Logged By |
|---|---|
| 1:50 | EW |

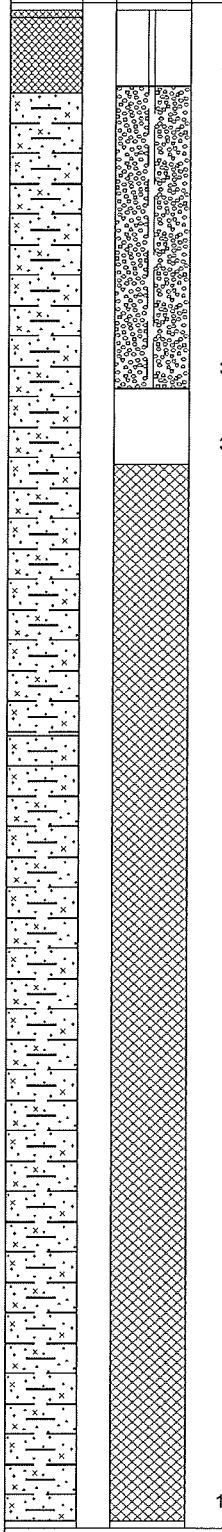
**Figure No.**
1624927.BH1

# Site Analytical Services Ltd.

| Site | Borehole Number |
|---|---|
| 115-119 GOLDHURST TERRACE,LONDON,NW6 3HR | BH1 |

| Installation Type | Dimensions | Client | Job Number |
|---|---|---|---|
| Single Installation | Internal Diameter of Tube [A] = 50 mm<br>Diameter of Filter Zone = 128 mm | HIVE 1 LIMITED | 1624927 |

| Location | Ground Level (mOD) | Engineer | Sheet |
|---|---|---|---|
| TQ260841 | 38.84 | ELLIOTT WOOD PARTNERSHIP LLP | 1/1 |



| Legend | Water | Instr (A) | Level (mOD) | Depth (m) | Description |
|---|---|---|---|---|---|
| | | | 37.84 | 1.00 | Bentonite Seal |
| | | | | | Slotted Standpipe |
| | | | 33.84 | 5.00 | Bentonite Seal |
| | | | 32.84 | 6.00 | |
| | | | | | General Backfill |
| | | | 18.84 | 20.00 | |

**Groundwater Strikes During Drilling**

| Date | Time | Depth Struck (m) | Casing Depth (m) | Inflow Rate | Readings 5 min | Readings 10 min | Readings 15 min | Readings 20 min | Depth Sealed (m) |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |

**Groundwater Observations During Drilling**

| Date | Start of Shift Time | Start of Shift Depth Hole (m) | Start of Shift Casing Depth (m) | Start of Shift Water Depth (m) | Start of Shift Water Level (mOD) | End of Shift Time | End of Shift Depth Hole (m) | End of Shift Casing Depth (m) | End of Shift Water Depth (m) | End of Shift Water Level (mOD) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | |

**Instrument Groundwater Observations**

**Inst. [A] Type :** Slotted Standpipe

| Date | Instrument [A] Time | Instrument [A] Depth (m) | Instrument [A] Level (mOD) | Remarks |
|---|---|---|---|---|
| | | | | |

**Remarks**
Lockable cover set in cement

# Site Analytical Services Ltd.

## Standard Penetration Test Results

**Site** : 115-119 GOLDHURST TERRACE,LONDON,NW6 3HR

**Client** : HIVE 1 LIMITED

**Engineer**: ELLIOTT WOOD PARTNERSHIP LLP

**Job Number** 1624927

**Sheet** 1 / 1

| Borehole Number | Base of Borehole (m) | End of Seating Drive (m) | End of Test Drive (m) | Test Type | Seating Blows per 75mm | | Blows for each 75mm penetration | | | | Result | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 1 | 2 | 1 | 2 | 3 | 4 | | |
| BH1 | 1.00 | 1.15 | 1.45 | CPT | 1 | 2 | 3 | 3 | 3 | 2 | N=11 | |
| BH1 | 3.00 | 3.15 | 3.45 | SPT | 2 | 3 | 4 | 4 | 5 | 5 | N=18 | |
| BH1 | 5.00 | 5.15 | 5.45 | SPT | 4 | 5 | 6 | 5 | 5 | 6 | N=22 | |
| BH1 | 8.00 | 8.15 | 8.45 | SPT | 6 | 7 | 7 | 8 | 7 | 8 | N=30 | |
| BH1 | 11.00 | 11.15 | 11.45 | SPT | 8 | 7 | 8 | 8 | 9 | 8 | N=33 | |
| BH1 | 14.00 | 14.15 | 14.45 | SPT | 9 | 10 | 11 | 13 | 12 | 13 | N=49 | |
| BH1 | 17.00 | 17.15 | 17.45 | SPT | 12 | 13 | 13 | 14 | 14 | 15 | N=56 | |
| BH1 | 19.55 | 19.70 | 20.00 | SPT | 9 | 13 | 14 | 15 | 14 | 15 | N=58 | |

# Site Analytical Services Ltd.

| Site | Borehole Number |
|---|---|
| 115-119 GOLDHURST TERRACE,LONDON,NW6 3HR | WS1 |

| Boring Method | Casing Diameter | Ground Level (mOD) | Client | Job Number |
|---|---|---|---|---|
| ROTARY PERCUSSIVE | 128mm cased to 0.00m | 39.28 | HIVE 1 LIMITED | 1624927 |
| | **Location** | **Dates** | **Engineer** | **Sheet** |
| | TQ260841 | 15/03/2016 | ELLIOTT WOOD PARTNERSHIP LLP | 1/1 |

| Depth (m) | Sample / Tests | Casing Depth (m) | Water Depth (m) | Field Records | Level (mOD) | Depth (m) (Thickness) | Description | Legend | Water |
|---|---|---|---|---|---|---|---|---|---|
| 0.25 | D1 | | | | | (0.80) | MADE GROUND: Grass surface over black sandy clay with fragments of brick and concrete rubble | | |
| 0.50 | D2 | | | | | | | | |
| 0.75 | D3 | | | | 38.48 | 0.80 | | | |
| 1.00 | D4 | | | | | (0.40) | MADE GROUND: Stiff, brown silty clay with fragments of brick and concrete rubble | | |
| 1.00 | V1 94 | | | | 38.08 | 1.20 | | | |
| 1.50 | D5 | | | | | | Stiff becoming very stiff, brown silty sandy CLAY with occasional gypsum crystals | | |
| 1.50 | V2 115 | | | | | | | | |
| 2.00 | D6 | | | | | | | | |
| 2.00 | V3 130+ | | | | | | | | |
| 2.50 | D7 | | | | | | | | |
| 2.50 | V4 130+ | | | | | | | | |
| 3.00 | D8 | | | | | (3.80) | | | |
| 3.00 | V5 130+ | | | | | | | | |
| 3.50 | D9 | | | | | | | | |
| 3.50 | V6 130+ | | | | | | | | |
| 4.00 | D10 | | | | | | | | |
| 4.00 | V7 130+ | | | | | | | | |
| 4.50 | D11 | | | | | | | | |
| 4.50 | V8 130+ | | | | | | | | |
| 5.00 | D12 | | | | 34.28 | 5.00 | | | |
| 5.00 | V9 130+ | | | | | | Complete at 5.00m | | |

**Remarks**
D= Disturbed Sample
V= Vane Test - Result in kPa
Groundwater was not encountered during boring/excavation
Excavating from 0.00m to 1.00m for 1 hour.

| Scale (approx) | Logged By |
|---|---|
| 1:50 | EW |

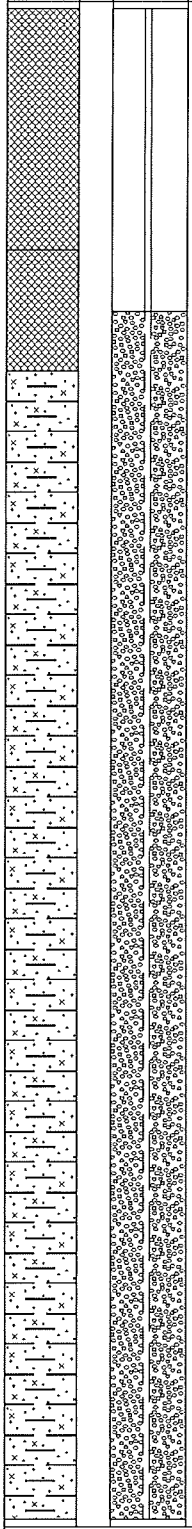
**Figure No.** 1624927.WS1

# Site Analytical Services Ltd.

| Site | Borehole Number |
|---|---|
| 115-119 GOLDHURST TERRACE,LONDON,NW6 3HR | WS1 |

| Installation Type | Dimensions | Client | Job Number |
|---|---|---|---|
| Single Installation | Internal Diameter of Tube [A] = 50 mm<br>Diameter of Filter Zone = 128 mm | HIVE 1 LIMITED | 1624927 |

| Location | Ground Level (mOD) | Engineer | Sheet |
|---|---|---|---|
| TQ260841 | 39.28 | ELLIOTT WOOD PARTNERSHIP LLP | 1/1 |



| Legend | Water | Instr (A) | Level (mOD) | Depth (m) | Description |
|---|---|---|---|---|---|
| | | | 38.28 | 1.00 | Bentonite Seal |
| | | | 34.28 | 5.00 | Slotted Standpipe |

**Groundwater Strikes During Drilling**

| Date | Time | Depth Struck (m) | Casing Depth (m) | Inflow Rate | Readings 5 min | Readings 10 min | Readings 15 min | Readings 20 min | Depth Sealed (m) |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |

**Groundwater Observations During Drilling**

| Date | Start of Shift Time | Start of Shift Depth Hole (m) | Start of Shift Casing Depth (m) | Start of Shift Water Depth (m) | Start of Shift Water Level (mOD) | End of Shift Time | End of Shift Depth Hole (m) | End of Shift Casing Depth (m) | End of Shift Water Depth (m) | End of Shift Water Level (mOD) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | |

**Instrument Groundwater Observations**

Inst. [A] Type : Slotted Standpipe

| Date | Instrument [A] Time | Instrument [A] Depth (m) | Instrument [A] Level (mOD) | Remarks |
|---|---|---|---|---|
| | | | | |

**Remarks**
Lockable cover set in cement

# Site Analytical Services Ltd.

| Site | Borehole Number |
|---|---|
| 115-119 GOLDHURST TERRACE,LONDON,NW6 3HR | WS2 |

| Boring Method | Casing Diameter | Ground Level (mOD) | Client | Job Number |
|---|---|---|---|---|
| ROTARTY PERCUSSIVE | 128mm cased to 0.00m | 39.17 | HIVE 1 LIMITED | 1624927 |
| | **Location** TQ260841 | **Dates** 16/03/2016 | **Engineer** ELLIOTT WOOD PARTNERSHIP LLP | **Sheet** 1/1 |

| Depth (m) | Sample / Tests | Casing Depth (m) | Water Depth (m) | Field Records | Level (mOD) | Depth (m) (Thickness) | Description | Legend | Water |
|---|---|---|---|---|---|---|---|---|---|
| 0.25 | D1 | | | | | (0.70) | MADE GROUND: Grass over dark brown black slightly sandy clay with fragments of brick and concrete rubble, tile and wood | | |
| 0.50 | D2 | | | | | | | | |
| 0.75 | D3 | | | | 38.47 | 0.70 | | | |
| 1.00 | D4 | | | | | (0.50) | MADE GROUND: Stiff, light brown silty clay with fragments of brick and concrete rubble | | |
| 1.00 | V1 80 | | | | 37.97 | 1.20 | | | |
| 1.50 | D5 | | | | | | Stiff becoming very stiff, brown silty sandy CLAY with occasional gypsum crystals | | |
| 1.50 | V2 122 | | | | | | | | |
| 2.00 | D6 | | | | | | | | |
| 2.00 | V3 130+ | | | | | | | | |
| 2.50 | D7 | | | | | | | | |
| 2.50 | V4 130+ | | | | | | | | |
| 3.00 | D8 | | | | | (3.80) | | | |
| 3.00 | V5 130+ | | | | | | | | |
| 3.50 | D9 | | | | | | | | |
| 3.50 | V6 130+ | | | | | | | | |
| 4.00 | D10 | | | | | | | | |
| 4.00 | V7 130+ | | | | | | | | |
| 4.50 | D11 | | | | | | | | |
| 4.50 | V8 130+ | | | | | | | | |
| 5.00 | D12 | | | | 34.17 | 5.00 | | | |
| 5.00 | V9 130+ | | | | | | Complete at 5.00m | | |

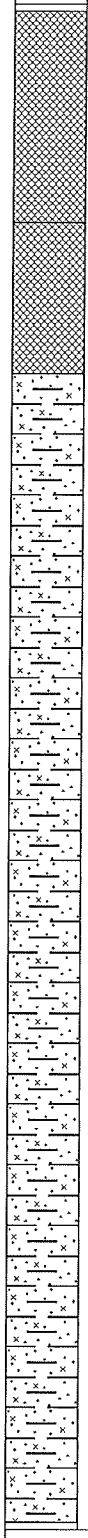
**Remarks**
D= Disturbed Sample
V= Vane Test - Result in kPa
Groundwater was not encountered during boring/excavation
Excavating from 0.00m to 1.00m for 1 hour.

| Scale (approx) | Logged By |
|---|---|
| 1:50 | EW |

**Figure No.** 1624927.WS2

# Site Analytical Services Ltd.

| | | |
|---|---|---|
| **Site** 115-119 GOLDHURST TERRACE,LONDON,NW6 3HR | | **Borehole Number** WS2 |
| **Installation Type** Single Installation | **Dimensions** Internal Diameter of Tube [A] = 50 mm<br>Diameter of Filter Zone = 128 mm | **Client** HIVE 1 LIMITED — **Job Number** 1624927 |
| | **Location** TQ260841 — **Ground Level (mOD)** 39.17 | **Engineer** ELLIOTT WOOD PARTNERSHIP LLP — **Sheet** 1/1 |



| Legend | Water | Instr (A) | Level (mOD) | Depth (m) | Description |
|---|---|---|---|---|---|
| | | | 38.17 | 1.00 | Bentonite Seal |
| | | | 34.37 | 4.80 | Slotted Standpipe |

**Groundwater Strikes During Drilling**

| Date | Time | Depth Struck (m) | Casing Depth (m) | Inflow Rate | Readings 5 min | Readings 10 min | Readings 15 min | Readings 20 min | Depth Sealed (m) |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |

**Groundwater Observations During Drilling**

| Date | Start of Shift Time | Start of Shift Depth Hole (m) | Start of Shift Casing Depth (m) | Start of Shift Water Depth (m) | Start of Shift Water Level (mOD) | End of Shift Time | End of Shift Depth Hole (m) | End of Shift Casing Depth (m) | End of Shift Water Depth (m) | End of Shift Water Level (mOD) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | |

**Instrument Groundwater Observations**

**Inst. [A] Type :** Slotted Standpipe

| Date | Instrument [A] Time | Instrument [A] Depth (m) | Instrument [A] Level (mOD) | Remarks |
|---|---|---|---|---|
| | | | | |

**Remarks**
Lockable cover set in cement

# Site Analytical Services Ltd.

| Site | Trial Pit Number |
|---|---|
| 115-119 GOLDHURST TERRACE,LONDON,NW6 3HR | TP2 |

| Excavation Method | Dimensions | Ground Level (mOD) | Client | Job Number |
|---|---|---|---|---|
| HAND EXCAVATION | 0.30m(W) x 0.30m(L) x 1.50m(D) | 39.23 | HIVE 1 LIMITED | 1624927 |
| | **Location** TQ260841 | **Dates** 15/03/2016 | **Engineer** ELLIOTT WOOD PARTNERSHIP LLP | **Sheet** 1/1 |

| Depth (m) | Sample / Tests | Water Depth (m) | Field Records | Level (mOD) | Depth (m) (Thickness) | Description | Legend | Water |
|---|---|---|---|---|---|---|---|---|
| 0.25 | D1 | | | | (0.50) | MADE GROUND: Grass surface over dark brown sandy clay with fragments of brick and concrete rubble | | |
| 0.50 | D2 | | | 38.73 | 0.50 | | | |
| 0.75 | D3 | | | | | MADE GROUND: Brown silty sandy clay with fragments of brick and concrete rubble | | |
| 1.00 | D4 | | | | (1.00) | | | |
| 1.50 | D5 | | | 37.73 | 1.50 | Complete at 1.50m | | |

**Plan**

**Remarks**

Excavating from 0.00m to 1.00m for 1 hour.
D= Disturbed Sample
Groundwater was not encountered during boring/excavation

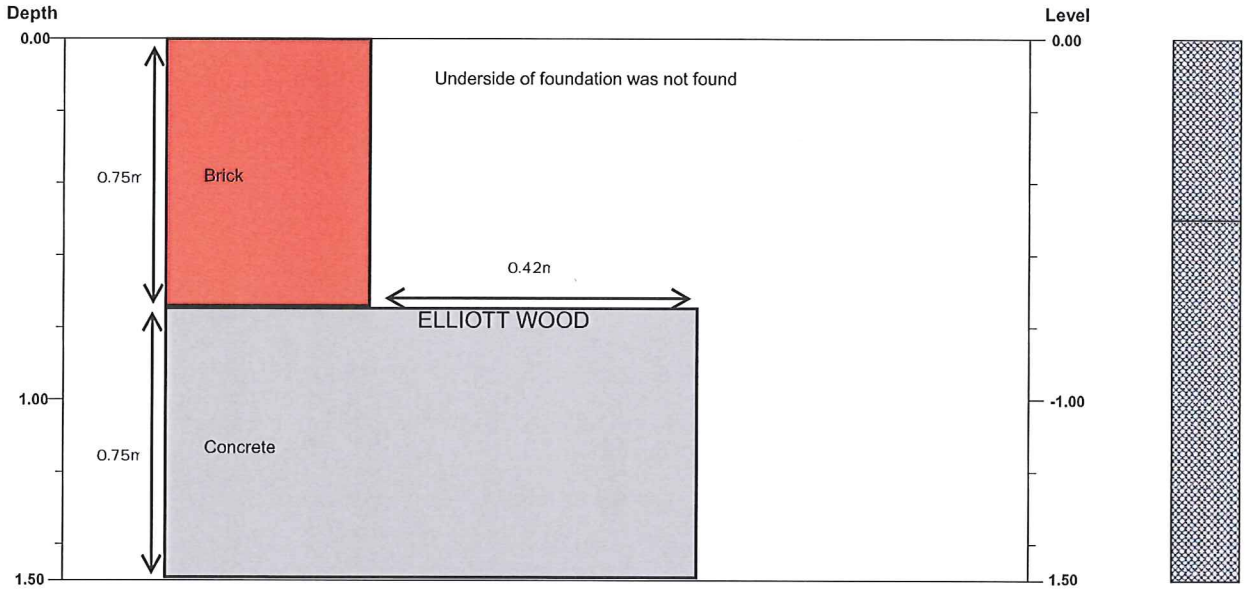
| Scale (approx) | Logged By | Figure No. |
|---|---|---|
| 1:50 | EW | 1624927.TP2 |

# Site Analytical Services Ltd.

| Site | Trial Pit Number |
|---|---|
| 115-119 GOLDHURST TERRACE,LONDON,NW6 3HR | TP2 |

| Method | Dimensions | Ground Level (mOD) | Client | Job Number |
|---|---|---|---|---|
| Trial Pit | 0.30m(W) x 0.30m(L) x 1.50m(D) | | HIVE 1 LIMITED | 1624927 |

| Orientation | Location | Dates | Engineer | Sheet |
|---|---|---|---|---|
| A / D / B / C | TQ260841 | 15/03/2016 | ELLIOTT WOOD PARTNERSHIP LLP | 1/1 |




## Strata

| Depth (m) | No. | Description |
|---|---|---|
| 0.00-0.50 | 1 | MADE GROUND: Grass surface over dark brown sandy clay with fragments of brick and concrete rubble |
| 0.50-1.50 | 2 | MADE GROUND: Brown silty sandy clay with fragments of brick and concrete rubble |

## Samples and Tests

| Depth (m) | Type | Field Records |
|---|---|---|
| 0.25 | D1 | |
| 0.50 | D2 | |
| 0.75 | D3 | |
| 1.00 | D4 | |
| 1.50 | D5 | |

**Excavation Method:**
HAND EXCAVATION

**Shoring / Support:**
N/A

**Stability:**
GOOD

**Backfill:**
ARISINGS

**Remarks**
D= Disturbed Sample
Groundwater was not encountered during boring/excavation
Excavating from 0.00m to 1.00m for 1 hour.

| | |
|---|---|
| Logged By | : EW |
| Checked By | : |
| Figure No. | : 1624927.TP2 |

# Site Analytical Services Ltd.

| Site | Trial Pit Number |
|---|---|
| 115-119 GOLDHURST TERRACE,LONDON,NW6 3HR | TP3 |

| Excavation Method | Dimensions | Ground Level (mOD) | Client | Job Number |
|---|---|---|---|---|
| HAND EXCAVATION | 0.30m(W) x 0.30m(L) x 0.58m(D) | 39.21 | HIVE 1 LIMITED | 1624927 |
| | **Location** TQ260841 | **Dates** 14/03/2016 | **Engineer** ELLIOTT WOOD PARTNERSHIP LLP | **Sheet** 1/1 |

| Depth (m) | Sample / Tests | Water Depth (m) | Field Records | Level (mOD) | Depth (m) (Thickness) | Description | Legend | Water |
|---|---|---|---|---|---|---|---|---|
| 0.25 | D1 | | | | (0.58) | MADE GROUND: Grass surface over dark brown black slightly silty clay with fragments of brick and concrete rubble | | |
| 0.58 | D2 | | | 38.63 | 0.58 | Complete at 0.58m | | |

**Plan**

**Remarks**

Excavating from 0.00m to 1.00m for 1 hour.
D= Disturbed Sample
Groundwater was not encountered during boring/excavation

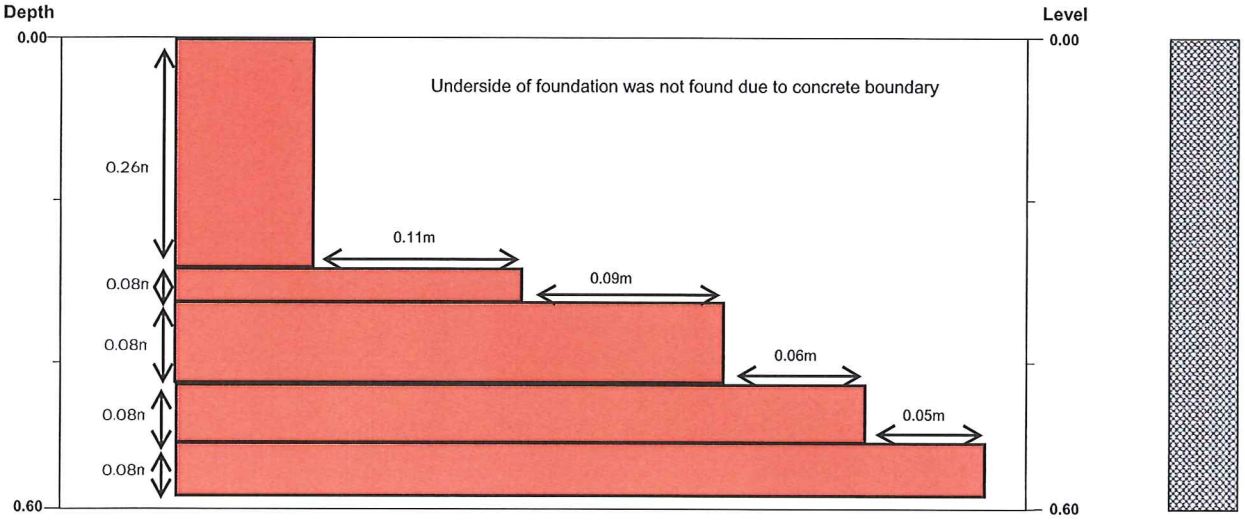
| Scale (approx) | Logged By | Figure No. |
|---|---|---|
| 1:50 | EW | 1624927.TP3 |

# Site Analytical Services Ltd.

| Site | Trial Pit Number |
|---|---|
| 115-119 GOLDHURST TERRACE,LONDON,NW6 3HR | TP3 |

| Method | Dimensions | Ground Level (mOD) | Client | Job Number |
|---|---|---|---|---|
| Trial Pit | 0.30m(W) x 0.30m(L) x 0.58m(D) | | HIVE 1 LIMITED | 1624927 |

| Orientation | Location | Dates | Engineer | Sheet |
|---|---|---|---|---|
| A / D B / C | TQ260841 | 14/03/2016 | ELLIOTT WOOD PARTNERSHIP LLP | 1/1 |




## Strata

| Depth (m) | No. | Description |
|---|---|---|
| 0.00-0.58 | 1 | MADE GROUND: Grass surface over dark brown black slightly silty clay with fragments of brick and concrete rubble |

## Samples and Tests

| Depth (m) | Type | Field Records |
|---|---|---|
| 0.25 | D1 | |
| 0.58 | D2 | |

**Excavation Method:**
HAND EXCAVATION

**Shoring / Support:**
N/A

**Stability:**
GOOD

**Backfill:**
ARISINGS

**Remarks**
D= Disturbed Sample
Groundwater was not encountered during boring/excavation
Excavating from 0.00m to 1.00m for 1 hour.

| | |
|---|---|
| Logged By | : EW |
| Checked By | : |
| Figure No. | : 1624927.TP3 |

# Site Analytical Services Ltd.

| Site | Trial Pit Number |
|---|---|
| 115-119 GOLDHURST TERRACE,LONDON,NW6 3HR | TP4 |

| Excavation Method | Dimensions | Ground Level (mOD) | Client | Job Number |
|---|---|---|---|---|
| HAND EXCAVATION | 0.30m(W) x 0.30m(L) x 1.20m(D) | 39.30 | HIVE 1 LIMITED | 1624927 |
| | **Location** TQ260841 | **Dates** 14/03/2016 | **Engineer** ELLIOTT WOOD PARTNERSHIP LLP | **Sheet** 1/1 |

| Depth (m) | Sample / Tests | Water Depth (m) | Field Records | Level (mOD) | Depth (m) (Thickness) | Description | Legend | Water |
|---|---|---|---|---|---|---|---|---|
| | | | | | (0.30) | MADE GROUND: Grass surface over brown clayey sand with fragments of brick and concrete rubble | | |
| 0.25 | D1 | | | 39.00 | 0.30 | | | |
| 0.50 | D2 | | | | (0.46) | MADE GROUND: Dark brown sandy clay with fragments of brick and concrete rubble and ash | | |
| 0.75 | D3 | | | 38.54 | 0.76 | | | |
| 0.90 | D4 | | | | (0.44) | MADE GROUND: Soft dark brown silty sandy clay with fragments of brick and concrete rubble | | |
| 0.90-1.20 | M1 56/300 | | | 38.10 | 1.20 | | | |
| | | | | | | Complete at 1.20m | | |

**Plan**

**Remarks**

Excavating from 0.00m to 1.00m for 1 hour.
D= Disturbed Sample
M= Makintosh Probe - Blows/Penetration (mm)
Groundwater was not encountered during boring/excavation

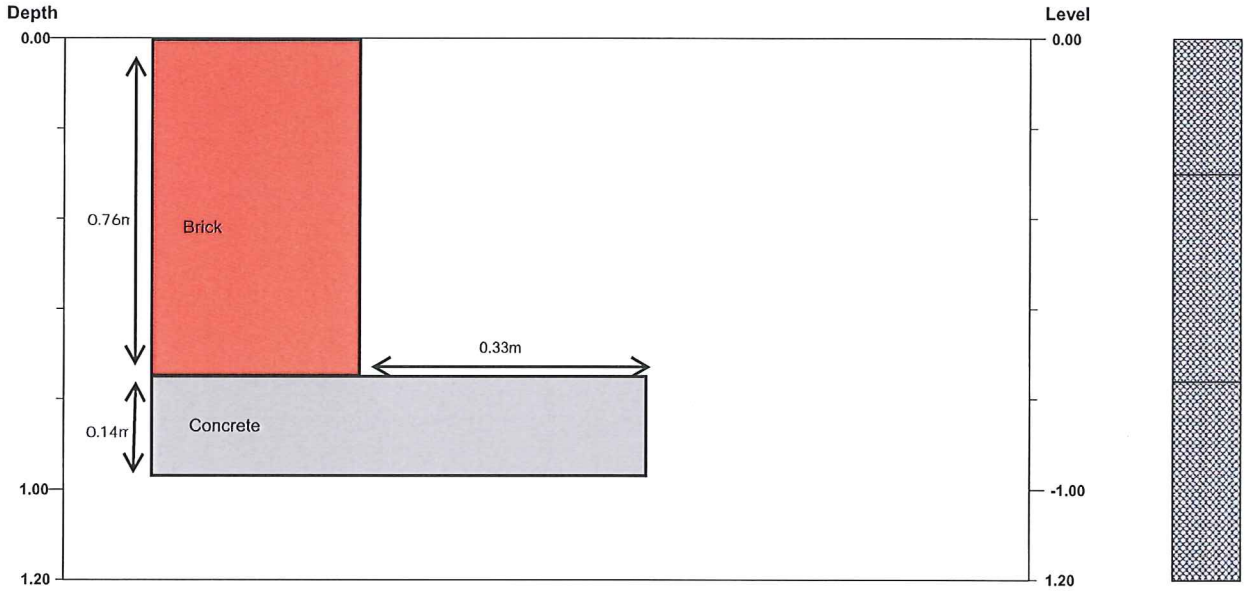
| Scale (approx) | Logged By | Figure No. |
|---|---|---|
| 1:50 | EW | 1624927.TP3 |

# Site Analytical Services Ltd.

| Site | Trial Pit Number |
|---|---|
| 115-119 GOLDHURST TERRACE,LONDON,NW6 3HR | TP4 |

| Method | Dimensions | Ground Level (mOD) | Client | Job Number |
|---|---|---|---|---|
| Trial Pit | 0.30m(W) x 0.30m(L) x 1.20m(D) | | HIVE 1 LIMITED | 1624927 |

| Orientation | Location | Dates | Engineer | Sheet |
|---|---|---|---|---|
| A / D / B / C | TQ260841 | 14/03/2016 | ELLIOTT WOOD PARTNERSHIP LLP | 1/1 |




## Strata

| Depth (m) | No. | Description |
|---|---|---|
| 0.00-0.30 | 1 | MADE GROUND: Grass surface over brown clayey sand with fragments of brick and concrete rubble |
| 0.30-0.76 | 2 | MADE GROUND: Dark brown sandy clay with fragments of brick and concrete rubble and ash |
| 0.76-1.20 | 3 | MADE GROUND: Soft dark brown silty sandy clay with fragments of brick and concrete rubble |

## Samples and Tests

| Depth (m) | Type | Field Records |
|---|---|---|
| 0.25 | D1 | |
| 0.50 | D2 | |
| 0.75 | D3 | |
| 0.90 | D4 | |
| 0.90-1.20 | M1 56/300 | |

**Excavation Method:**
HAND EXCAVATION

**Shoring / Support:**
N/A

**Stability:**
GOOD

**Backfill:**
ARISINGS

**Remarks**
D= Disturbed Sample
M= Makintosh Probe - Blows/Penetration (mm)
Groundwater was not encountered during boring/excavation
Excavating from 0.00m to 1.00m for 1 hour.

| | |
|---|---|
| Logged By | : EW |
| Checked By | : |
| Figure No. | : 1624927.TP3 |

# Site Analytical Services Ltd.

| Site | Trial Pit Number |
|---|---|
| 115-119 GOLDHURST TERRACE,LONDON,NW6 3HR | TP5 |

| Excavation Method | Dimensions | Ground Level (mOD) | Client | Job Number |
|---|---|---|---|---|
| HAND EXCAVATION | 0.30m(W) x 0.30m(L) x 0.90m(D) | 39.20 | HIVE 1 LIMITED | 1624927 |
| | **Location** TQ260841 | **Dates** 14/03/2016 | **Engineer** ELLIOTT WOOD PARTNERSHIP LLP | **Sheet** 1/1 |

| Depth (m) | Sample / Tests | Water Depth (m) | Field Records | Level (mOD) | Depth (m) (Thickness) | Description | Legend | Water |
|---|---|---|---|---|---|---|---|---|
| 0.25 | D1 | | | | (0.90) | MADE GROUND: Grass surface over dark brown silty slightly clayey sand with fragments of brick and concrete rubble | | |
| 0.50 | D2 | | | | | | | |
| 0.90 | D3 | | | 38.30 | 0.90 | Complete at 0.90m | | |

**Plan**

**Remarks**

Excavating from 0.00m to 1.00m for 1 hour.
D= Disturbed Sample
Groundwater was not encountered during boring/excavation

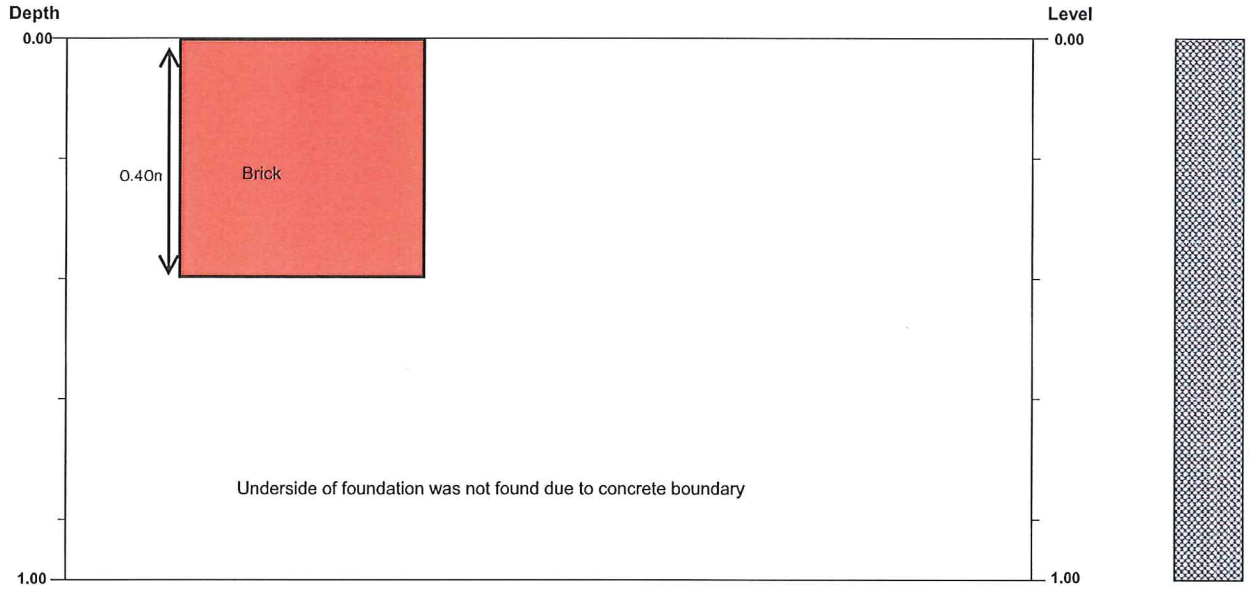
| Scale (approx) | Logged By | Figure No. |
|---|---|---|
| 1:50 | EW | 1624927.TP5 |

# Site Analytical Services Ltd.

| Site | Trial Pit Number |
|---|---|
| 115-119 GOLDHURST TERRACE,LONDON,NW6 3HR | TP5 |

| Method | Dimensions | Ground Level (mOD) | Client | Job Number |
|---|---|---|---|---|
| Trial Pit | 0.30m(W) x 0.30m(L) x 0.90m(D) | | HIVE 1 LIMITED | 1624927 |

| Orientation | Location | Dates | Engineer | Sheet |
|---|---|---|---|---|
| A / D / B / C | TQ260841 | 14/03/2016 | ELLIOTT WOOD PARTNERSHIP LLP | 1/1 |




| Strata | | | Samples and Tests | | |
|---|---|---|---|---|---|
| Depth (m) | No. | Description | Depth (m) | Type | Field Records |
| 0.00-0.90 | 1 | MADE GROUND: Grass surface over dark brown silty slightly clayey sand with fragments of brick and concrete rubble | 0.25<br>0.50<br>0.90 | D1<br>D2<br>D3 | |

**Excavation Method:**
HAND EXCAVATION

**Shoring / Support:**
N/A

**Stability:**
GOOD

**Backfill:**
ARISINGS

**Remarks**
D= Disturbed Sample
Groundwater was not encountered during boring/excavation
Excavating from 0.00m to 1.00m for 1 hour.

| | |
|---|---|
| Logged By | : EW |
| Checked By | : |
| Figure No. | : 1624927.TP5 |

# Site Analytical Services Ltd.

| Site | Trial Pit Number |
|---|---|
| 115-119 GOLDHURST TERRACE,LONDON,NW6 3HR | TP6A |

| Excavation Method | Dimensions | Ground Level (mOD) | Client | Job Number |
|---|---|---|---|---|
| HAND EXCAVATION | 0.30m(W) x 0.30m(L) x 1.20m(D) | 39.25 | HIVE 1 LIMITED | 1624927 |
| | **Location** TQ260841 | **Dates** 14/03/2016 | **Engineer** ELLIOTT WOOD PARTNERSHIP LLP | **Sheet** 1/1 |

| Depth (m) | Sample / Tests | Water Depth (m) | Field Records | Level (mOD) | Depth (m) (Thickness) | Description | Legend | Water |
|---|---|---|---|---|---|---|---|---|
| | | | | 39.20 | 0.05 | MADE GROUND: Paving Slab | | |
| | | | | 39.15 | 0.10 | MADE GROUND: Yellow sand | | |
| 0.25 | D1 | | | | (1.10) | MADE GROUND: Loose, dark brown black clayey sand with fragments of brick and concrete rubble | | |
| 0.50 | D2 | | | | | | | |
| 0.75 | D3 | | | | | | | |
| 0.90 | D4 | | | | | | | |
| 0.90-1.20 | M1 78/300 | | | 38.05 | 1.20 | Complete at 1.20m | | |

**Plan**

**Remarks**

Excavating from 0.00m to 1.00m for 1 hour.
D= Disturbed sample
M= Makintosh Probe - Blows Penetration (mm)
Groundwater was not encountered during boring/excavation

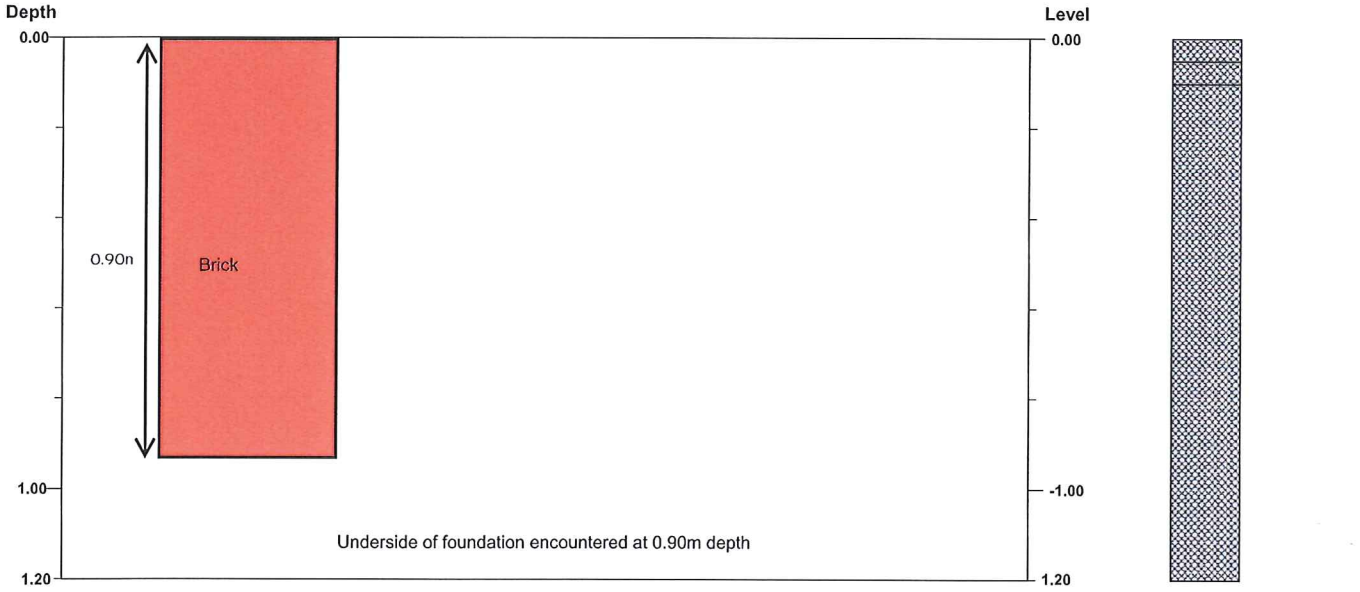
| Scale (approx) | Logged By | Figure No. |
|---|---|---|
| 1:50 | EW | 1624927.TP6A |

# Site Analytical Services Ltd.

| Site | Trial Pit Number |
|---|---|
| 115-119 GOLDHURST TERRACE,LONDON,NW6 3HR | TP6A |

| Method | Dimensions | Ground Level (mOD) | Client | Job Number |
|---|---|---|---|---|
| Trial Pit | 0.30m(W) x 0.30m(L) x 1.20m(D) | | HIVE 1 LIMITED | 1624927 |

| Orientation | Location | Dates | Engineer | Sheet |
|---|---|---|---|---|
| A / D B / C | TQ260841 | 14/03/2016 | ELLIOTT WOOD PARTNERSHIP LLP | 1/1 |




**Strata**

| Depth (m) | No. | Description |
|---|---|---|
| 0.00-0.05 | 1 | MADE GROUND: Paving Slab |
| 0.05-0.10 | 2 | MADE GROUND: Yellow sand |
| 0.10-1.20 | 3 | MADE GROUND: Loose, dark brown black clayey sand with fragments of brick and concrete rubble |

**Samples and Tests**

| Depth (m) | Type | Field Records |
|---|---|---|
| 0.25 | D1 | |
| 0.50 | D2 | |
| 0.75 | D3 | |
| 0.90 | D4 | |
| 0.90-1.20 | M1 78/300 | |

**Excavation Method:**
HAND EXCAVATION

**Shoring / Support:**
N/A

**Stability:**
GOOD

**Backfill:**
ARISINGS

**Remarks**
D= Disturbed sample
M= Makintosh Probe - Blows Penetration (mm)
Groundwater was not encountered during boring/excavation
Excavating from 0.00m to 1.00m for 1 hour.

**Logged By** : EW
**Checked By** :
**Figure No.** : 1624927.TP6A

# Site Analytical Services Ltd.

| Site | Trial Pit Number |
|---|---|
| 115-119 GOLDHURST TERRACE,LONDON,NW6 3HR | TP6B |

| Excavation Method | Dimensions | Ground Level (mOD) | Client | Job Number |
|---|---|---|---|---|
| HAND EXCAVATION | 0.30m(W) x 0.30m(L) x 1.30m(D) | 39.25 | HIVE 1 LIMITED | 1624927 |
| | **Location** | **Dates** | **Engineer** | **Sheet** |
| | TQ260841 | 14/03/2016 | ELLIOTT WOOD PARTNERSHIP LLP | 1/1 |

| Depth (m) | Sample / Tests | Water Depth (m) | Field Records | Level (mOD) | Depth (m) (Thickness) | Description | Legend | Water |
|---|---|---|---|---|---|---|---|---|
| | | | | 39.20 | 0.05 | MADE GROUND: Paving Slab | | |
| | | | | 39.15 | 0.10 | MADE GROUND: Yellow sand | | |
| 0.25 | D1 | | | | | | | |
| 0.50 | D2 | | | | (1.20) | MADE GROUND: Loose, dark brown black clayey sand with fragments of brick and concrete rubble | | |
| 0.75 | D3 | | | | | | | |
| 0.90 | D4 | | | | | | | |
| 0.90-1.20 | M1 78/300 | | | | | | | |
| | | | | 37.95 | 1.30 | Complete at 1.30m | | |

**Plan**

**Remarks**

Excavating from 0.00m to 1.00m for 1 hour.
D= Disturbed sample
M= Makintosh Probe - Blows Penetration (mm)
Groundwater was not encountered during boring/excavation

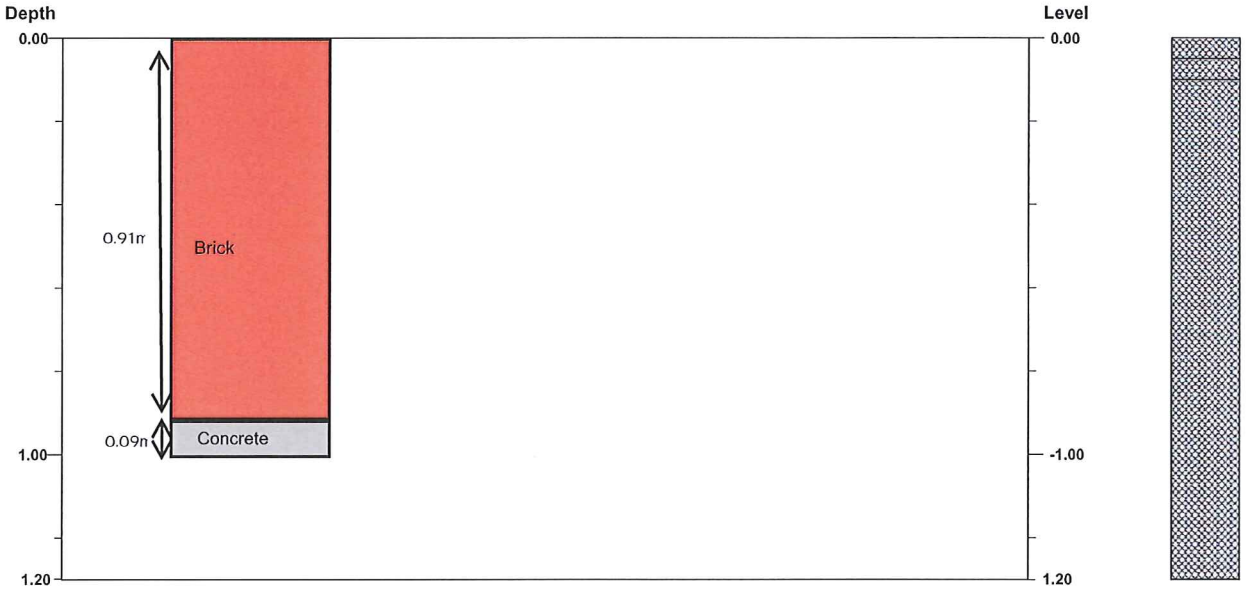
| Scale (approx) | Logged By | Figure No. |
|---|---|---|
| 1:50 | EW | 1624927.TP6B |

# Site Analytical Services Ltd.

| Site | Trial Pit Number |
|---|---|
| 115-119 GOLDHURST TERRACE,LONDON,NW6 3HR | TP6B |

| Method | Dimensions | Ground Level (mOD) | Client | Job Number |
|---|---|---|---|---|
| Trial Pit | 0.30m(W) x 0.30m(L) x 1.30m(D) | | HIVE 1 LIMITED | 1624927 |

| Orientation | Location | Dates | Engineer | Sheet |
|---|---|---|---|---|
| A D B C | TQ260841 | 14/03/2016 | ELLIOTT WOOD PARTNERSHIP LLP | 1/1 |




## Strata

| Depth (m) | No. | Description |
|---|---|---|
| 0.00-0.05 | 1 | MADE GROUND: Paving Slab |
| 0.05-0.10 | 2 | MADE GROUND: Yellow sand |
| 0.10-1.30 | 3 | MADE GROUND: Loose, dark brown black clayey sand with fragments of brick and concrete rubble |

## Samples and Tests

| Depth (m) | Type | Field Records |
|---|---|---|
| 0.25 | D1 | |
| 0.50 | D2 | |
| 0.75 | D3 | |
| 0.90 | D4 | |
| 0.90-1.20 | M1 78/300 | |

**Excavation Method:**
HAND EXCAVATION

**Shoring / Support:**
N/A

**Stability:**
GOOD

**Backfill:**
ARISINGS

**Remarks**
D= Disturbed sample
M= Makintosh Probe - Blows Penetration (mm)
Groundwater was not encountered during boring/excavation
Excavating from 0.00m to 1.00m for 1 hour.

**Logged By** : EW
**Checked By** :
**Figure No.** : 1624927.TP6B

# Site Analytical Services Ltd.

| Site | Trial Pit Number |
|---|---|
| 115-119 GOLDHURST TERRACE,LONDON,NW6 3HR | TP8 |

| Excavation Method | Dimensions | Ground Level (mOD) | Client | Job Number |
|---|---|---|---|---|
| HAND EXCAVATION | 0.30m(W) x 0.30m(L) x 1.50m(D) | 38.98 | HIVE 1 LIMITED | 1624927 |
| | **Location** TQ260841 | **Dates** 14/03/2016 | **Engineer** ELLIOTT WOOD PARTNERSHIP LLP | **Sheet** 1/1 |

| Depth (m) | Sample / Tests | Water Depth (m) | Field Records | Level (mOD) | Depth (m) (Thickness) | Description | Legend | Water |
|---|---|---|---|---|---|---|---|---|
| | | | | 38.86 | 0.12 | MADE GROUND: Concrete | | |
| 0.25 | D1 | | | | | MADE GROUND: Brown sandy clay with large fragments of brick and concrete rubble | | |
| 0.50 | D2 | | | | | | | |
| 0.75 | D3 | | | | (1.38) | | | |
| 1.00 | D4 | | | | | | | |
| 1.50 | D5 | | | 37.48 | 1.50 | Complete at 1.50m | | |

**Plan**

**Remarks**

Excavating from 0.00m to 1.00m for 1 hour.
D= Disturbed Sample
Groundwater was not encountered during boring/excavation

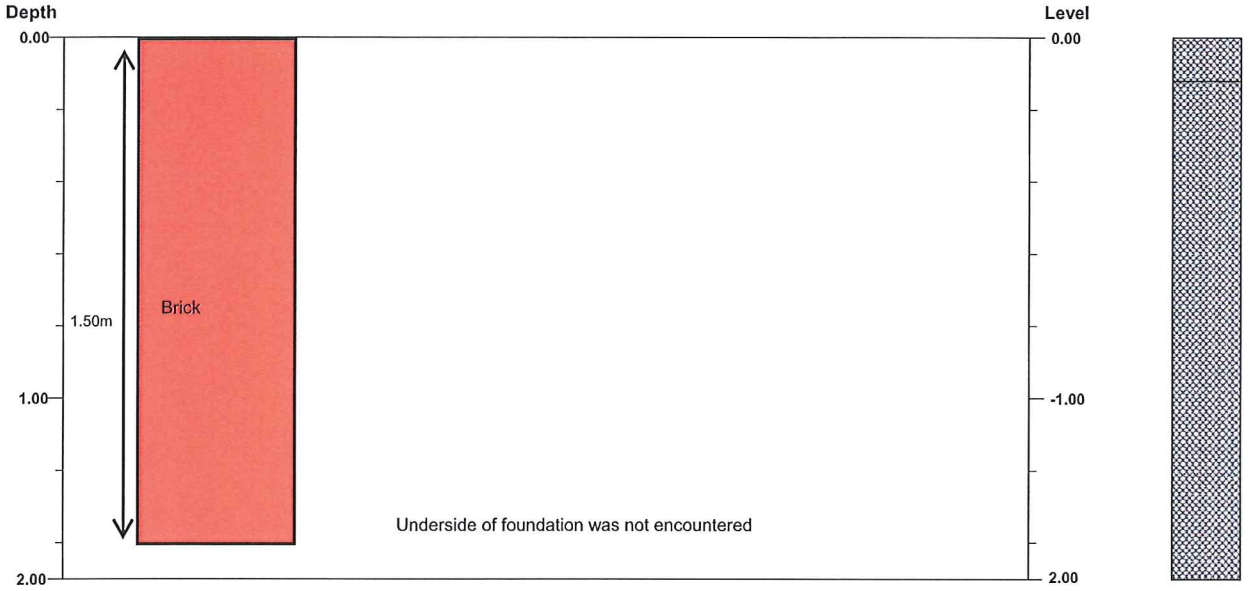
| Scale (approx) | Logged By | Figure No. |
|---|---|---|
| 1:50 | EW | 1624927.TP8 |

# Site Analytical Services Ltd.

| Site | Trial Pit Number |
|---|---|
| 115-119 GOLDHURST TERRACE,LONDON,NW6 3HR | TP8 |

| Method | Dimensions | Ground Level (mOD) | Client | Job Number |
|---|---|---|---|---|
| Trial Pit | 0.30m(W) x 0.30m(L) x 1.50m(D) | | HIVE 1 LIMITED | 1624927 |

| Orientation | Location | Dates | Engineer | Sheet |
|---|---|---|---|---|
| A / D B / C | TQ260841 | 14/03/2016 | ELLIOTT WOOD PARTNERSHIP LLP | 1/1 |




## Strata

| Depth (m) | No. | Description |
|---|---|---|
| 0.00-0.12 | 1 | MADE GROUND: Concrete |
| 0.12-1.50 | 2 | MADE GROUND: Brown sandy clay with large fragments of brick and concrete rubble |

## Samples and Tests

| Depth (m) | Type | Field Records |
|---|---|---|
| 0.25 | D1 | |
| 0.50 | D2 | |
| 0.75 | D3 | |
| 1.00 | D4 | |
| 1.50 | D5 | |

**Excavation Method:**
HAND EXCAVATION

**Shoring / Support:**
N/A

**Stability:**
GOOD

**Backfill:**
ARISING

**Remarks**
D= Disturbed Sample
Groundwater was not encountered during boring/excavation
Excavating from 0.00m to 1.00m for 1 hour.

**Logged By** : EW
**Checked By** :
**Figure No.** : 1624927.TP8

# Site Analytical Services Ltd.

| Site | Trial Pit Number |
|---|---|
| 115-119 GOLDHURST TERRACE,LONDON,NW6 3HR | TP9 |

| Excavation Method | Dimensions | Ground Level (mOD) | Client | Job Number |
|---|---|---|---|---|
| HAND EXCAVATION | 0.30m(W) x 0.30m(L) x 1.00m(D) | 38.87 | HIVE 1 LIMITED | 1624927 |
| | **Location** TQ260841 | **Dates** 15/03/2016 | **Engineer** ELLIOTT WOOD PARTNERSHIP LLP | **Sheet** 1/1 |

| Depth (m) | Sample / Tests | Water Depth (m) | Field Records | Level (mOD) | Depth (m) (Thickness) | Description | Legend | Water |
|---|---|---|---|---|---|---|---|---|
| 0.25 | D1 | | | | (0.75) | MADE GROUND: Grass surface over dark brown black sandy clay with fragments of brick and concrete rubble and various different materials | | |
| 0.50 | D2 | | | | | | | |
| 0.75 | D3 | | | 38.12 | 0.75 | | | |
| 1.00 | D4 | | | | (0.25) | MADE GROUND: Dark brown slightly clayey sand with fragments of brick and concrete rubble | | |
| | | | | 37.87 | 1.00 | Complete at 1.00m | | |

**Plan**

**Remarks**

Excavating from 0.00m to 1.00m for 1 hour.
D= Disturbed Sample
Groundwater was not encountered during boring/excavation

| Scale (approx) | Logged By | Figure No. |
|---|---|---|
| 1:50 | EW | 1624927.TP9 |

# Site Analytical Services Ltd.

| Site | Trial Pit Number |
|---|---|
| 115-119 GOLDHURST TERRACE,LONDON,NW6 3HR | TP10 |

| Excavation Method | Dimensions | Ground Level (mOD) | Client | Job Number |
|---|---|---|---|---|
| HAND EXCAVATION | 0.30m(W) x 0.30m(L) x 1.00m(D) | 39.15 | HIVE 1 LIMITED | 1624927 |
| | **Location** TQ260841 | **Dates** 15/03/2016 | **Engineer** ELLIOTT WOOD PARTNERSHIP LLP | **Sheet** 1/1 |

| Depth (m) | Sample / Tests | Water Depth (m) | Field Records | Level (mOD) | Depth (m) (Thickness) | Description | Legend | Water |
|---|---|---|---|---|---|---|---|---|
| 0.25 | D1 | | | | (1.00) | MADE GROUND: Grass surface over dark brown black sandy clay with fragments of brick and concrete rubble and various different materials | | |
| 0.50 | D2 | | | | | | | |
| 0.75 | D3 | | | | | | | |
| 1.00 | D4 | | | 38.15 | 1.00 | Complete at 1.00m | | |

**Plan**

**Remarks**

Excavating from 0.00m to 1.00m for 1 hour.
D= Disturbed Sample
Groundwater was not encountered during boring/excavation

| Scale (approx) | Logged By | Figure No. |
|---|---|---|
| 1:50 | EW | 1624927.TP9 |

# Site Analytical Services Ltd.

| | | | |
|---|---|---|---|
| **Site** 115-119 GOLDHURST TERRACE,LONDON,NW6 3HR | | | **Trial Pit Number** TP11 |
| **Excavation Method** HAND EXCAVATION | **Dimensions** 0.30m(W) x 0.30m(L) x 1.00m(D) | **Ground Level (mOD)** 39.39 | **Client** HIVE 1 LIMITED | **Job Number** 1624927 |
| | **Location** TQ260841 | **Dates** 15/03/2016 | **Engineer** ELLIOTT WOOD PARTNERSHIP LLP | **Sheet** 1/1 |

| Depth (m) | Sample / Tests | Water Depth (m) | Field Records | Level (mOD) | Depth (m) (Thickness) | Description | Legend | Water |
|---|---|---|---|---|---|---|---|---|
| 0.25 | D1 | | | | (0.75) | MADE GROUND: Grass surface over dark brown black sandy clay with fragments of brick and concrete rubble and various different materials | | |
| 0.50 | D2 | | | | | | | |
| 0.75 | D3 | | | 38.64 | 0.75 | | | |
| 1.00 | D4 | | | | (0.25) | MADE GROUND: Dark brown slightly clayey sand with fragments of brick and concrete rubble | | |
| | | | | 38.39 | 1.00 | Complete at 1.00m | | |

**Plan**

**Remarks**

Excavating from 0.00m to 1.00m for 1 hour.
D= Disturbed Sample
Groundwater was not encountered during boring/excavation

| Scale (approx) | Logged By | Figure No. |
|---|---|---|
| 1:50 | EW | 1624927.TP11 |

# APPENDIX `B'

## In-Situ, Laboratory Test and Groundwater Monitoring Data

# Site Analytical Services Ltd.

| Site | Borehole Number |
|---|---|
| 115-119 GOLDHURST TERRACE,LONDON,NW6 3HR | WS2 |

| In Situ Permeability Type | Test No. | Ground Level (mOD) | Client | Job Number |
|---|---|---|---|---|
| Falling Head | 1 | 39.17 | HIVE 1 LIMITED | 1624927 |
| | **Location** | **Dates** | **Engineer** | **Sheet** |
| | TQ260841 | 16/03/2016 | ELLIOTT WOOD PARTNERSHIP LLP | 1/1 |

| | | |
|---|---|---|
| Height of casing above ground level: | 0.00 | m |
| Depth to Base of Borehole: | 3.00 | m bgl |
| Depth to Base of Casing: | 0.00 | m bgl |
| Depth to equilibrium water level: | | m bgl |
| Test Length L: | 3.00 | m |
| Diameter of Test Length D: | 0.10 | m |
| Area of Test Section: | 0.0079 | m2 |
| Intake Factor F: (after condition A, figure 6, BS 5930) | 0.2000 | |

**PERMEABILITY (after Hvorslev, 1951)**

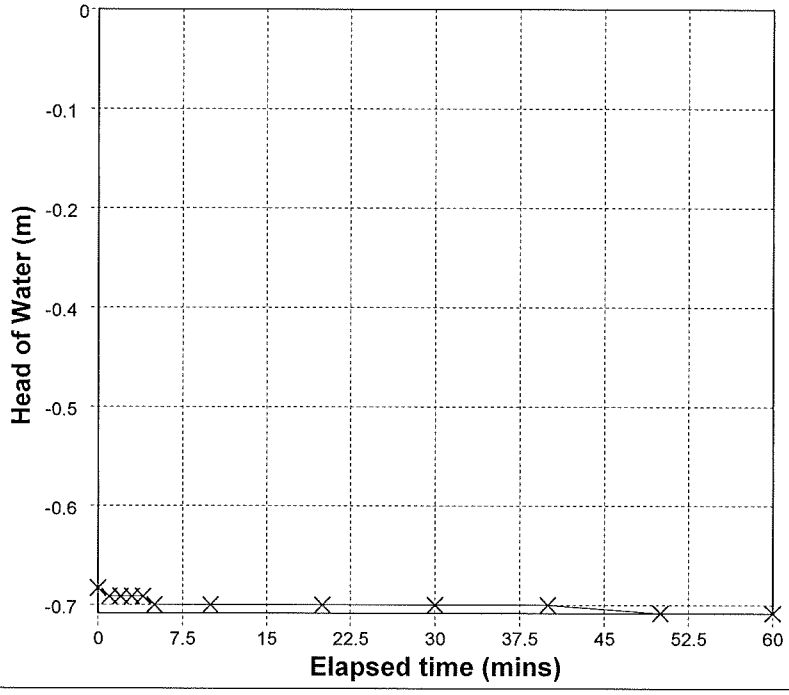
**General Approach**

**H1 selected at t= -0.71 mins (=t1 = 22.2 secs)**

**H2 selected at t= -0.729 mins (=t2 = 3560.4 secs)**

**k =** -2.93E-07 **ms-1**

| Elapsed time (mins) | Depth to water (m bgl) | Head of Water, H (m) | Ht / Ho |
|---|---|---|---|
| 0.0 | 0.700 | -0.700 | 1.000 |
| 1.0 | 0.710 | -0.710 | 1.014 |
| 2.0 | 0.710 | -0.710 | 1.014 |
| 3.0 | 0.710 | -0.710 | 1.014 |
| 4.0 | 0.710 | -0.710 | 1.014 |
| 5.0 | 0.720 | -0.720 | 1.029 |
| 10.0 | 0.720 | -0.720 | 1.029 |
| 20.0 | 0.720 | -0.720 | 1.029 |
| 30.0 | 0.720 | -0.720 | 1.029 |
| 40.0 | 0.720 | -0.720 | 1.029 |
| 50.0 | 0.730 | -0.730 | 1.043 |
| 60.0 | 0.730 | -0.730 | 1.043 |




**Remarks**

**Key:** bgl = Below Ground Level btoc = Below Top of Casing

Site Analytical Services Ltd.

Ref: 16/24927

**UNDRAINED TRIAXIAL COMPRESSION TEST**

**LOCATION** 115 -119 Goldhurst Terrace, London, NW6 3HR

| BH/TP No. | MOISTURE CONTENT | BULK DENSITY | LATERAL PRESSURE | COMPRESSIVE STRENGTH | COHESION | ANGLE OF SHEARING RESISTANCE | DEPTH |
|---|---|---|---|---|---|---|---|
| | % | $Mg/m^3$ | $kN/m^2$ | $kN/m^2$ | $kN/m^2$ | degrees | m |
| BH1 | 25 | 2.02 | 50 | 302 | 151 | | 2.25 |
| | 26 | 1.99 | 80 | 370 | 185 | | 4.25 |
| | 28 | 1.96 | 130 | 369 | 185 | | 6.75 |
| | 27 | 1.99 | 190 | 424 | 212 | | 9.75 |
| | 27 | 2.01 | 250 | 417 | 209 | | 12.75 |
| | 22 | 2.07 | 310 | 424 | 212 | | 15.75 |
| | 23 | 2.07 | 370 | 436 | 218 | | 18.75 |

**Table 1**

Site Analytical Services Ltd.

Ref: 16/24927

**PLASTICITY INDEX & MOISTURE CONTENT DETERMINATIONS**

**LOCATION** 115 -119 Goldhurst Terrace, London, NW6 3HR

| BH/TP No. | Depth m | Natural Moisture % | Liquid Limit % | Plastic Limit % | Plasticity Index % | Passing 425 µm % | Class |
|---|---|---|---|---|---|---|---|
| BH1 | 3.75 | 28 | 61 | 27 | 34 | 100 | CH |
| WS1 | 4.00 | 30 | 63 | 27 | 36 | 99 | CH |
| WS2 | 3.50 | 30 | 68 | 31 | 37 | 100 | CH |

**Table 2**

Site Analytical Services Ltd.

Ref: 16/24927

## GROUNDWATER MONITORING

**LOCATION** 115 -119 Goldhurst Terrace, London, NW6 3HR

| GROUNDWATER MONITORING RECORD | | | |
|---|---|---|---|
| **Date** | **Weather Conditions** | **Ground Conditions** | **Temperature (°C)** |
| 12/04/2016 | Sunny with light clouds | Damp | 11.6 |
| **Monitoring Point Location** | **Depth to water (mBGL)** | | **Depth to Base of well (mBGL)** |
| BH1 | DRY | | 5.05 |
| WS1 | 1.09 | | 5.00 |
| WS2 | 1.34 | | 4.69 |

**Table 3**

Site Analytical Services Ltd.

Ref: 16/24927

## GROUNDWATER MONITORING

**LOCATION** 115 -119 Goldhurst Terrace, London, NW6 3HR

| GROUNDWATER MONITORING RECORD | | | |
|---|---|---|---|
| **Date** | **Weather Conditions** | **Ground Conditions** | **Temperature (°C)** |
| 29/04/2016 | Sunny with showers | Wet | 8.7 |
| **Monitoring Point Location** | **Depth to water (mBGL)** | | **Depth to Base of well (mBGL)** |
| BH1 | DRY | | 5.05 |
| WS1 | 1.04 | | 5.00 |
| WS2 | 1.05 | | 4.69 |

**Table 3a**

**Aubrey Davidson**
Site Analytical Services Ltd
Units 14 -15
River Road Business Park
33 River Road
Barking
Essex
IG11 0EA

**t:** 0208 5948134
**f:** 0208 5948072
**e:** aubreyd@siteanalytical.co.uk

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

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

# Analytical Report Number : 16-14309

| | | | |
|---|---|---|---|
| **Project / Site name:** | 115-119 Goldhurst Terrace | **Samples received on:** | 30/03/2016 |
| **Your job number:** | 16-24927 | **Samples instructed on:** | 30/03/2016 |
| **Your order number:** | 22624 | **Analysis completed by:** | 06/04/2016 |
| **Report Issue Number:** | 1 | **Report issued on:** | 06/04/2016 |
| **Samples Analysed:** | 4 soil samples | | |

**Signed:**

Rexona Rahman
Reporting Manager
**For & on behalf of i2 Analytical Ltd.**

**Signed:**

Emma Winter
Assistant Reporting Manager
**For & on behalf of i2 Analytical Ltd.**

Other office located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland

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 |

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**Analytical Report Number: 16-14309**

**Project / Site name: 115-119 Goldhurst Terrace**
**Your Order No: 22624**

| Lab Sample Number | | | | 555110 | 555111 | 555112 | 555113 | |
|---|---|---|---|---|---|---|---|---|
| Sample Reference | | | | BH1 | BH1 | WS1 | WS2 | |
| Sample Number | | | | None Supplied | None Supplied | None Supplied | None Supplied | |
| Depth (m) | | | | 8.00 | 14.00 | 5.00 | 4.50 | |
| Date Sampled | | | | 30/03/2016 | 30/03/2016 | 30/03/2016 | 30/03/2016 | |
| Time Taken | | | | None Supplied | None Supplied | None Supplied | None Supplied | |
| **Analytical Parameter (Soil Analysis)** | **Units** | **Limit of detection** | **Accreditation Status** | | | | | |
| Moisture Content | % | N/A | NONE | 21 | 19 | 19 | 20 | |
| Total mass of sample received | kg | 0.001 | NONE | 0.21 | 0.24 | 1.5 | 1.6 | |
| Whole Sample Crushed | | N/A | NONE | Crushed | Crushed | Crushed | Crushed | |
| **General Inorganics** | | | | | | | | |
| pH | pH Units | N/A | MCERTS | 8.1 | 8.3 | 8.2 | 8.0 | |
| Water Soluble Sulphate (2:1 Leachate Equivalent) | g/l | 0.00125 | MCERTS | 2.1 | 1.0 | 2.3 | 3.5 | |

**Analytical Report Number : 16-14309**

**Project / Site name: 115-119 Goldhurst Terrace**

* 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 topsoil/loam soil types. Data for unaccredited types of solid should be interpreted with care.

| Lab Sample Number | Sample Reference | Sample Number | Depth (m) | Sample Description * |
|---|---|---|---|---|
| 555110 | BH1 | None Supplied | 8.00 | Brown clay and loam. |
| 555111 | BH1 | None Supplied | 14.00 | Brown clay and loam. |
| 555112 | WS1 | None Supplied | 5.00 | Brown clay and loam. |
| 555113 | WS2 | None Supplied | 4.50 | Brown clay and loam. |

**Analytical Report Number : 16-14309**

**Project / Site name: 115-119 Goldhurst Terrace**

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

| Analytical Test Name | Analytical Method Description | Analytical Method Reference | Method number | Wet / Dry Analysis | Accreditation Status |
|---|---|---|---|---|---|
| Crush Whole Sample | Either: Client specific preparation instructions - sample(s) crushed whole prior to analysis; OR Sample unsuitable for standard preparation and therefore crushed whole prior to analysis. | In house method, applicable to dry samples only. | L019-UK | D | NONE |
| Moisture Content | Moisture content, determined gravimetrically. | In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests | L019-UK/PL | W | NONE |
| pH in soil (automated) | Determination of pH in soil by addition of water followed by automated electrometric measurement. | In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests | L099-PL | D | MCERTS |
| Stones content of soil | Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight. | In-house method based on British Standard Methods and MCERTS requirements. | L019-UK/PL | D | NONE |
| Sulphate, water soluble, in soil | Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent). | In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests, 2:1 water:soil extraction, analysis by ICP-OES. | L038-PL | D | MCERTS |

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

**Aubrey Davidson**
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Watford,
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**f:** 01923 237404
**e:** reception@i2analytical.com

# Analytical Report Number : 16-14304

| | | | |
|---|---|---|---|
| **Project / Site name:** | 115-119 Goldhurst Terrace | **Samples received on:** | 30/03/2016 |
| **Your job number:** | 16-24927 | **Samples instructed on:** | 30/03/2016 |
| **Your order number:** | 22624 | **Analysis completed by:** | 06/04/2016 |
| **Report Issue Number:** | 1 | **Report issued on:** | 06/04/2016 |
| **Samples Analysed:** | 6 soil samples | | |

**Signed:**

Dr Claire Stone
Quality Manager
**For & on behalf of i2 Analytical Ltd.**

**Signed:**

Emma Winter
Assistant Reporting Manager
**For & on behalf of i2 Analytical Ltd.**

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

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

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

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

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**Analytical Report Number: 16-14304**

**Project / Site name: 115-119 Goldhurst Terrace**
**Your Order No: 22624**

| Lab Sample Number | | | | 555089 | 555090 | 555091 | 555092 | 555093 |
|---|---|---|---|---|---|---|---|---|
| Sample Reference | | | | BH1 | TP9 | TP10 | TP11 | WS1 |
| Sample Number | | | | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Depth (m) | | | | 0.25 | 0.50 | 0.50 | 0.25 | 0.25 |
| Date Sampled | | | | 30/03/2016 | 30/03/2016 | 30/03/2016 | 30/03/2016 | 30/03/2016 |
| Time Taken | | | | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| **Analytical Parameter (Soil Analysis)** | **Units** | **Limit of detection** | **Accreditation Status** | | | | | |
| Stone Content | % | 0.1 | NONE | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Moisture Content | % | N/A | NONE | 12 | 22 | 21 | 21 | 27 |
| Total mass of sample received | kg | 0.001 | NONE | 0.60 | 0.49 | 0.58 | 0.59 | 0.55 |
| Whole Sample Crushed | | N/A | NONE | Crushed | Crushed | Crushed | Crushed | Crushed |
| Asbestos in Soil | Type | N/A | ISO 17025 | Not-detected | Not-detected | Not-detected | Not-detected | Not-detected |
| **General Inorganics** | | | | | | | | |
| pH | pH Units | N/A | MCERTS | 8.4 | 8.6 | 8.3 | 9.3 | 8.4 |
| Total Cyanide | mg/kg | 1 | MCERTS | < 1 | < 1 | 1 | < 1 | < 1 |
| Complex Cyanide | mg/kg | 1 | NONE | < 1 | < 1 | 1 | < 1 | < 1 |
| Free Cyanide | mg/kg | 1 | NONE | < 1 | < 1 | < 1 | < 1 | < 1 |
| Total Sulphate as $SO_4$ | mg/kg | 50 | MCERTS | 1400 | 3000 | 2300 | 12000 | 1100 |
| Water Soluble Sulphate (2:1 Leachate Equivalent) | g/l | 0.00125 | MCERTS | 0.067 | 0.13 | 0.23 | 1.9 | 0.032 |
| Sulphide | mg/kg | 1 | MCERTS | 8.6 | 9.9 | 1.8 | 11 | 1.9 |
| Total Organic Carbon (TOC) | % | 0.1 | MCERTS | 0.9 | 1.6 | 2.2 | 1.0 | 1.3 |
| **Total Phenols** | | | | | | | | |
| Total Phenols (monohydric) | mg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| **Speciated PAHs** | | | | | | | | |
| Naphthalene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Acenaphthylene | mg/kg | 0.1 | MCERTS | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Acenaphthene | mg/kg | 0.1 | MCERTS | < 0.10 | < 0.10 | 0.23 | < 0.10 | < 0.10 |
| Fluorene | mg/kg | 0.1 | MCERTS | < 0.10 | < 0.10 | 0.22 | < 0.10 | < 0.10 |
| Phenanthrene | mg/kg | 0.1 | MCERTS | 1.3 | 0.81 | 7.3 | 1.1 | 1.9 |
| Anthracene | mg/kg | 0.1 | MCERTS | 0.24 | 0.13 | 0.37 | 0.17 | 0.32 |
| Fluoranthene | mg/kg | 0.1 | MCERTS | 3.2 | 1.8 | 11 | 2.2 | 3.4 |
| Pyrene | mg/kg | 0.1 | MCERTS | 2.7 | 1.7 | 8.8 | 1.8 | 3.1 |
| Benzo(a)anthracene | mg/kg | 0.1 | MCERTS | 1.4 | 0.69 | 2.9 | 0.91 | 1.6 |
| Chrysene | mg/kg | 0.05 | MCERTS | 1.2 | 0.80 | 4.3 | 0.84 | 1.4 |
| Benzo(b)fluoranthene | mg/kg | 0.1 | MCERTS | 1.7 | 0.99 | 4.3 | 1.1 | 1.7 |
| Benzo(k)fluoranthene | mg/kg | 0.1 | MCERTS | 0.67 | 0.27 | 2.4 | 0.45 | 0.69 |
| Benzo(a)pyrene | mg/kg | 0.1 | MCERTS | 1.3 | 0.66 | 3.4 | 0.85 | 1.4 |
| Indeno(1,2,3-cd)pyrene | mg/kg | 0.1 | MCERTS | 0.78 | 0.43 | 2.4 | 0.53 | 0.87 |
| Dibenz(a,h)anthracene | mg/kg | 0.1 | MCERTS | < 0.10 | < 0.10 | 0.50 | < 0.10 | 0.28 |
| Benzo(ghi)perylene | mg/kg | 0.05 | MCERTS | 0.93 | 0.52 | 2.7 | 0.59 | 1.1 |
| **Total PAH** | | | | | | | | |
| Speciated Total EPA-16 PAHs | mg/kg | 1.6 | MCERTS | 15.3 | 8.86 | 50.6 | 10.6 | 17.7 |
| **Heavy Metals / Metalloids** | | | | | | | | |
| Arsenic (aqua regia extractable) | mg/kg | 1 | MCERTS | 14 | 18 | 23 | 19 | 28 |
| Beryllium (aqua regia extractable) | mg/kg | 0.06 | MCERTS | 0.9 | 0.8 | 1.2 | 1.0 | 1.4 |
| Boron (total) | mg/kg | 1 | MCERTS | 6.0 | 8.3 | 8.3 | 13 | 11 |
| Cadmium (aqua regia extractable) | mg/kg | 0.2 | MCERTS | 0.3 | 0.9 | 3.0 | < 0.2 | 0.4 |
| Chromium (hexavalent) | mg/kg | 4 | MCERTS | < 4.0 | < 4.0 | < 4.0 | < 4.0 | < 4.0 |
| Chromium (aqua regia extractable) | mg/kg | 1 | MCERTS | 22 | 22 | 29 | 24 | 35 |
| Copper (aqua regia extractable) | mg/kg | 1 | MCERTS | 50 | 64 | 94 | 59 | 110 |
| Lead (aqua regia extractable) | mg/kg | 1 | MCERTS | 440 | 1200 | 1100 | 390 | 700 |
| Mercury (aqua regia extractable) | mg/kg | 0.3 | MCERTS | < 0.3 | < 0.3 | 14 | < 0.3 | 1.3 |
| Nickel (aqua regia extractable) | mg/kg | 1 | MCERTS | 13 | 16 | 24 | 19 | 26 |
| Selenium (aqua regia extractable) | mg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Vanadium (aqua regia extractable) | mg/kg | 1 | MCERTS | 43 | 42 | 51 | 48 | 62 |
| Zinc (aqua regia extractable) | mg/kg | 1 | MCERTS | 290 | 590 | 1200 | 320 | 590 |

**Analytical Report Number: 16-14304**

**Project / Site name: 115-119 Goldhurst Terrace**
**Your Order No: 22624**

| Lab Sample Number | | | | 555089 | 555090 | 555091 | 555092 | 555093 |
|---|---|---|---|---|---|---|---|---|
| **Sample Reference** | | | | BH1 | TP9 | TP10 | TP11 | WS1 |
| **Sample Number** | | | | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| **Depth (m)** | | | | 0.25 | 0.50 | 0.50 | 0.25 | 0.25 |
| **Date Sampled** | | | | 30/03/2016 | 30/03/2016 | 30/03/2016 | 30/03/2016 | 30/03/2016 |
| **Time Taken** | | | | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| **Analytical Parameter (Soil Analysis)** | **Units** | **Limit of detection** | **Accreditation Status** | | | | | |
| **Monoaromatics** | | | | | | | | |
| Benzene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Toluene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Ethylbenzene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| p & m-xylene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| o-xylene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| MTBE (Methyl Tertiary Butyl Ether) | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| **Petroleum Hydrocarbons** | | | | | | | | |
| TPH-CWG - Aliphatic >EC5 - EC6 | mg/kg | 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| TPH-CWG - Aliphatic >EC6 - EC8 | mg/kg | 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| TPH-CWG - Aliphatic >EC8 - EC10 | mg/kg | 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| TPH-CWG - Aliphatic >EC10 - EC12 | mg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| TPH-CWG - Aliphatic >EC12 - EC16 | mg/kg | 2 | MCERTS | < 2.0 | < 2.0 | < 2.0 | < 2.0 | < 2.0 |
| TPH-CWG - Aliphatic >EC16 - EC21 | mg/kg | 8 | MCERTS | < 8.0 | < 8.0 | < 8.0 | < 8.0 | < 8.0 |
| TPH-CWG - Aliphatic >EC21 - EC35 | mg/kg | 8 | MCERTS | < 8.0 | 9.2 | 35 | 58 | 18 |
| **TPH-CWG - Aliphatic (EC5 - EC35)** | mg/kg | 10 | MCERTS | < 10 | 13 | 39 | 62 | 21 |
| TPH-CWG - Aromatic >EC5 - EC7 | mg/kg | 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| TPH-CWG - Aromatic >EC7 - EC8 | mg/kg | 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| TPH-CWG - Aromatic >EC8 - EC10 | mg/kg | 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| TPH-CWG - Aromatic >EC10 - EC12 | mg/kg | 1 | MCERTS | < 1.0 | 1.0 | < 1.0 | < 1.0 | < 1.0 |
| TPH-CWG - Aromatic >EC12 - EC16 | mg/kg | 2 | MCERTS | < 2.0 | 2.3 | 3.6 | < 2.0 | < 2.0 |
| TPH-CWG - Aromatic >EC16 - EC21 | mg/kg | 10 | MCERTS | 13 | 14 | 38 | 15 | 10 |
| TPH-CWG - Aromatic >EC21 - EC35 | mg/kg | 10 | MCERTS | 13 | 14 | 55 | 150 | 15 |
| **TPH-CWG - Aromatic (EC5 - EC35)** | mg/kg | 10 | MCERTS | 27 | 31 | 98 | 170 | 26 |

**Analytical Report Number: 16-14304**

**Project / Site name: 115-119 Goldhurst Terrace**
**Your Order No: 22624**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Lab Sample Number** | | | | 555094 | | | | |
| **Sample Reference** | | | | WS2 | | | | |
| **Sample Number** | | | | None Supplied | | | | |
| **Depth (m)** | | | | 0.50 | | | | |
| **Date Sampled** | | | | 30/03/2016 | | | | |
| **Time Taken** | | | | None Supplied | | | | |
| **Analytical Parameter (Soil Analysis)** | **Units** | **Limit of detection** | **Accreditation Status** | | | | | |
| Stone Content | % | 0.1 | NONE | < 0.1 | | | | |
| Moisture Content | % | N/A | NONE | 23 | | | | |
| Total mass of sample received | kg | 0.001 | NONE | 0.56 | | | | |
| Whole Sample Crushed | | N/A | NONE | Crushed | | | | |
| Asbestos in Soil | Type | N/A | ISO 17025 | Not-detected | | | | |
| **General Inorganics** | | | | | | | | |
| pH | pH Units | N/A | MCERTS | 9.4 | | | | |
| Total Cyanide | mg/kg | 1 | MCERTS | < 1 | | | | |
| Complex Cyanide | mg/kg | 1 | NONE | < 1 | | | | |
| Free Cyanide | mg/kg | 1 | NONE | < 1 | | | | |
| Total Sulphate as $SO_4$ | mg/kg | 50 | MCERTS | 4200 | | | | |
| Water Soluble Sulphate (2:1 Leachate Equivalent) | g/l | 0.00125 | MCERTS | 0.39 | | | | |
| Sulphide | mg/kg | 1 | MCERTS | 15 | | | | |
| Total Organic Carbon (TOC) | % | 0.1 | MCERTS | 1.4 | | | | |
| **Total Phenols** | | | | | | | | |
| Total Phenols (monohydric) | mg/kg | 1 | MCERTS | < 1.0 | | | | |
| **Speciated PAHs** | | | | | | | | |
| Naphthalene | mg/kg | 0.05 | MCERTS | < 0.05 | | | | |
| Acenaphthylene | mg/kg | 0.1 | MCERTS | < 0.10 | | | | |
| Acenaphthene | mg/kg | 0.1 | MCERTS | < 0.10 | | | | |
| Fluorene | mg/kg | 0.1 | MCERTS | < 0.10 | | | | |
| Phenanthrene | mg/kg | 0.1 | MCERTS | 0.55 | | | | |
| Anthracene | mg/kg | 0.1 | MCERTS | < 0.10 | | | | |
| Fluoranthene | mg/kg | 0.1 | MCERTS | 1.1 | | | | |
| Pyrene | mg/kg | 0.1 | MCERTS | 1.0 | | | | |
| Benzo(a)anthracene | mg/kg | 0.1 | MCERTS | 0.45 | | | | |
| Chrysene | mg/kg | 0.05 | MCERTS | 0.61 | | | | |
| Benzo(b)fluoranthene | mg/kg | 0.1 | MCERTS | 0.69 | | | | |
| Benzo(k)fluoranthene | mg/kg | 0.1 | MCERTS | 0.27 | | | | |
| Benzo(a)pyrene | mg/kg | 0.1 | MCERTS | 0.53 | | | | |
| Indeno(1,2,3-cd)pyrene | mg/kg | 0.1 | MCERTS | 0.40 | | | | |
| Dibenz(a,h)anthracene | mg/kg | 0.1 | MCERTS | < 0.10 | | | | |
| Benzo(ghi)perylene | mg/kg | 0.05 | MCERTS | 0.51 | | | | |
| **Total PAH** | | | | | | | | |
| Speciated Total EPA-16 PAHs | mg/kg | 1.6 | MCERTS | 6.11 | | | | |
| **Heavy Metals / Metalloids** | | | | | | | | |
| Arsenic (aqua regia extractable) | mg/kg | 1 | MCERTS | 20 | | | | |
| Beryllium (aqua regia extractable) | mg/kg | 0.06 | MCERTS | 1.0 | | | | |
| Boron (total) | mg/kg | 1 | MCERTS | 12 | | | | |
| Cadmium (aqua regia extractable) | mg/kg | 0.2 | MCERTS | 0.5 | | | | |
| Chromium (hexavalent) | mg/kg | 4 | MCERTS | < 4.0 | | | | |
| Chromium (aqua regia extractable) | mg/kg | 1 | MCERTS | 25 | | | | |
| Copper (aqua regia extractable) | mg/kg | 1 | MCERTS | 70 | | | | |
| Lead (aqua regia extractable) | mg/kg | 1 | MCERTS | 830 | | | | |
| Mercury (aqua regia extractable) | mg/kg | 0.3 | MCERTS | < 0.3 | | | | |
| Nickel (aqua regia extractable) | mg/kg | 1 | MCERTS | 21 | | | | |
| Selenium (aqua regia extractable) | mg/kg | 1 | MCERTS | < 1.0 | | | | |
| Vanadium (aqua regia extractable) | mg/kg | 1 | MCERTS | 52 | | | | |
| Zinc (aqua regia extractable) | mg/kg | 1 | MCERTS | 410 | | | | |

**Analytical Report Number: 16-14304**

**Project / Site name: 115-119 Goldhurst Terrace**
**Your Order No: 22624**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Lab Sample Number** | | | | 555094 | | | | |
| **Sample Reference** | | | | WS2 | | | | |
| **Sample Number** | | | | None Supplied | | | | |
| **Depth (m)** | | | | 0.50 | | | | |
| **Date Sampled** | | | | 30/03/2016 | | | | |
| **Time Taken** | | | | None Supplied | | | | |
| **Analytical Parameter (Soil Analysis)** | **Units** | **Limit of detection** | **Accreditation Status** | | | | | |
| **Monoaromatics** | | | | | | | | |
| Benzene | µg/kg | 1 | MCERTS | < 1.0 | | | | |
| Toluene | µg/kg | 1 | MCERTS | < 1.0 | | | | |
| Ethylbenzene | µg/kg | 1 | MCERTS | < 1.0 | | | | |
| p & m-xylene | µg/kg | 1 | MCERTS | < 1.0 | | | | |
| o-xylene | µg/kg | 1 | MCERTS | < 1.0 | | | | |
| MTBE (Methyl Tertiary Butyl Ether) | µg/kg | 1 | MCERTS | < 1.0 | | | | |

**Petroleum Hydrocarbons**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| TPH-CWG - Aliphatic >EC5 - EC6 | mg/kg | 0.1 | MCERTS | < 0.1 | | | | |
| TPH-CWG - Aliphatic >EC6 - EC8 | mg/kg | 0.1 | MCERTS | < 0.1 | | | | |
| TPH-CWG - Aliphatic >EC8 - EC10 | mg/kg | 0.1 | MCERTS | < 0.1 | | | | |
| TPH-CWG - Aliphatic >EC10 - EC12 | mg/kg | 1 | MCERTS | < 1.0 | | | | |
| TPH-CWG - Aliphatic >EC12 - EC16 | mg/kg | 2 | MCERTS | < 2.0 | | | | |
| TPH-CWG - Aliphatic >EC16 - EC21 | mg/kg | 8 | MCERTS | < 8.0 | | | | |
| TPH-CWG - Aliphatic >EC21 - EC35 | mg/kg | 8 | MCERTS | < 8.0 | | | | |
| **TPH-CWG - Aliphatic (EC5 - EC35)** | mg/kg | 10 | MCERTS | < 10 | | | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| TPH-CWG - Aromatic >EC5 - EC7 | mg/kg | 0.1 | MCERTS | < 0.1 | | | | |
| TPH-CWG - Aromatic >EC7 - EC8 | mg/kg | 0.1 | MCERTS | < 0.1 | | | | |
| TPH-CWG - Aromatic >EC8 - EC10 | mg/kg | 0.1 | MCERTS | < 0.1 | | | | |
| TPH-CWG - Aromatic >EC10 - EC12 | mg/kg | 1 | MCERTS | < 1.0 | | | | |
| TPH-CWG - Aromatic >EC12 - EC16 | mg/kg | 2 | MCERTS | < 2.0 | | | | |
| TPH-CWG - Aromatic >EC16 - EC21 | mg/kg | 10 | MCERTS | < 10 | | | | |
| TPH-CWG - Aromatic >EC21 - EC35 | mg/kg | 10 | MCERTS | < 10 | | | | |
| **TPH-CWG - Aromatic (EC5 - EC35)** | mg/kg | 10 | MCERTS | < 10 | | | | |

**Analytical Report Number : 16-14304**

**Project / Site name: 115-119 Goldhurst Terrace**

* 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 * |
|---|---|---|---|---|
| 555089 | BH1 | None Supplied | 0.25 | Brown loam and sand with glass and gravel |
| 555090 | TP9 | None Supplied | 0.50 | Brown loam and sand with gravel and brick. |
| 555091 | TP10 | None Supplied | 0.50 | Brown loam and sand with gravel and brick. |
| 555092 | TP11 | None Supplied | 0.25 | Brown loam and sand with gravel and vegetation. |
| 555093 | WS1 | None Supplied | 0.25 | Brown clay and loam with gravel and brick. |
| 555094 | WS2 | None Supplied | 0.50 | Brown loam and sand with gravel and brick. |

**Analytical Report Number : 16-14304**

**Project / Site name: 115-119 Goldhurst Terrace**

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

| Analytical Test Name | Analytical Method Description | Analytical Method Reference | Method number | Wet / Dry Analysis | Accreditation Status |
|---|---|---|---|---|---|
| Asbestos identification in soil | Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques. | In house method based on HSG 248 | A001-PL | D | ISO 17025 |
| BTEX and MTBE in soil (Monoaromatics) | Determination of BTEX in soil by headspace GC-MS. | In-house method based on USEPA8260 | L073B-PL | W | MCERTS |
| Complex cyanide in soil | Determination of complex cyanide by distillation followed by colorimetry. | In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar) | L080-PL | W | NONE |
| Crush Whole Sample | Either: Client specific preparation instructions - sample(s) crushed whole prior to analysis; OR Sample unsuitable for standard preparation and therefore crushed whole prior to analysis. | In house method, applicable to dry samples only. | L019-UK | D | NONE |
| Free cyanide in soil | Determination of free cyanide by distillation followed by colorimetry. | In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar) | L080-PL | W | NONE |
| Hexavalent chromium in soil | Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry. | In-house method | L080-PL | W | MCERTS |
| Metals in soil by ICP-OES | Determination of metals in soil by aqua-regia digestion followed by ICP-OES. | In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil. | L038-PL | D | MCERTS |
| Moisture Content | Moisture content, determined gravimetrically. | In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests | L019-UK/PL | W | NONE |
| Monohydric phenols in soil | Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry. | In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar) | L080-PL | W | MCERTS |
| pH in soil (automated) | Determination of pH in soil by addition of water followed by automated electrometric measurement. | In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests | L099-PL | D | MCERTS |
| Speciated EPA-16 PAHs in soil | Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards. | In-house method based on USEPA 8270 | L064-PL | D | MCERTS |
| Stones content of soil | Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight. | In-house method based on British Standard Methods and MCERTS requirements. | L019-UK/PL | D | NONE |
| Sulphate, water soluble, in soil | Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent). | In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests, 2:1 water:soil extraction, analysis by ICP-OES. | L038-PL | D | MCERTS |
| Sulphide in soil | Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode. | In-house method | L010-PL | D | MCERTS |
| Total cyanide in 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 (Skalar) | L080-PL | W | MCERTS |
| Total organic carbon in soil | Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate. | In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests | L023-PL | D | MCERTS |
| Total sulphate (as SO4 in soil) | Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES. | In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests | L038-PL | D | MCERTS |

**Analytical Report Number : 16-14304**

**Project / Site name: 115-119 Goldhurst Terrace**

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

| Analytical Test Name | Analytical Method Description | Analytical Method Reference | Method number | Wet / Dry Analysis | Accreditation Status |
|---|---|---|---|---|---|
| TPHCWG (Soil) | Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID. | In-house method | L076-PL | W | MCERTS |

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

Aubrey Davidson
Site Analytical Services Ltd
Units 14 & 15
River Road Business Park
33 River Road
Barking
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IG11 0EA

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# QTS Environmental Report No: 16-42402

| | |
|---|---|
| **Site Reference:** | 115-119 Goldhurst |
| **Project / Job Ref:** | 16/24927 |
| **Order No:** | 22625 |
| **Sample Receipt Date:** | 30/03/2016 |
| **Sample Scheduled Date:** | 31/03/2016 |
| **Report Issue Number:** | 1 |
| **Reporting Date:** | 06/04/2016 |

**Authorised by:**

Russell Jarvis
Associate Director of Client Services
**On behalf of QTS Environmental Ltd**

**Authorised by:**

Kevin Old
Associate Director of Laboratory
**On behalf of QTS Environmental Ltd**

**QTS Environmental Ltd**
**Unit 1, Rose Lane Industrial Estate**
**Rose Lane**
**Lenham Heath**
**Maidstone**
**Kent ME17 2JN**
**Tel : 01622 850410**

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| Soil Analysis Certificate | | | | | | |
|---|---|---|---|---|---|---|
| **QTS Environmental Report No: 16-42402** | **Date Sampled** | None Supplied | | | | |
| **Site Analytical Services Ltd** | **Time Sampled** | None Supplied | | | | |
| **Site Reference: 115-119 Goldhurst** | **TP / BH No** | WS2 | | | | |
| **Project / Job Ref: 16/24927** | **Additional Refs** | None Supplied | | | | |
| **Order No: 22625** | **Depth (m)** | 1.00 | | | | |
| **Reporting Date: 06/04/2016** | **QTSE Sample No** | 199189 | | | | |

| Determinand | Unit | RL | Accreditation | | | | | |
|---|---|---|---|---|---|---|---|---|
| Asbestos Screen | N/a | N/a | ISO17025 | Not Detected | | | | |
| pH | pH Units | N/a | MCERTS | 8.0 | | | | |
| Total Cyanide | mg/kg | < 2 | NONE | < 2 | | | | |
| Complex Cyanide | mg/kg | < 2 | NONE | < 2 | | | | |
| Free Cyanide | mg/kg | < 2 | NONE | < 2 | | | | |
| Total Sulphate as $SO_4$ | mg/kg | < 200 | NONE | 8296 | | | | |
| Total Sulphate as $SO_4$ | % | < 0.02 | NONE | 0.83 | | | | |
| W/S Sulphate as $SO_4$ (2:1) | mg/l | < 10 | MCERTS | 2610 | | | | |
| W/S Sulphate as $SO_4$ (2:1) | g/l | < 0.01 | MCERTS | 2.61 | | | | |
| Sulphide | mg/kg | < 5 | NONE | < 5 | | | | |
| Organic Matter | % | < 0.1 | MCERTS | 0.2 | | | | |
| Total Organic Carbon (TOC) | % | < 0.1 | MCERTS | 0.1 | | | | |
| Arsenic (As) | mg/kg | < 2 | MCERTS | 12 | | | | |
| W/S Boron | mg/kg | < 1 | NONE | < 1 | | | | |
| Cadmium (Cd) | mg/kg | < 0.2 | MCERTS | < 0.2 | | | | |
| Chromium (Cr) | mg/kg | < 2 | MCERTS | 47 | | | | |
| Chromium (hexavalent) | mg/kg | < 2 | NONE | < 2 | | | | |
| Copper (Cu) | mg/kg | < 4 | MCERTS | 21 | | | | |
| Lead (Pb) | mg/kg | < 3 | MCERTS | 14 | | | | |
| Mercury (Hg) | mg/kg | < 1 | NONE | < 1 | | | | |
| Nickel (Ni) | mg/kg | < 3 | MCERTS | 34 | | | | |
| Selenium (Se) | mg/kg | < 3 | NONE | < 3 | | | | |
| Zinc (Zn) | mg/kg | < 3 | MCERTS | 72 | | | | |
| Total Phenols (monohydric) | mg/kg | < 2 | NONE | < 2 | | | | |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30$^{O}$C

Analysis carried out on the dried sample is corrected for the stone content

The samples have been examined to identify the presence of asbestiform minerals by polarising light microscopy and dispersion staining technique to In-House Procedures QTSE600 Determination of Asbestos in Bulk Materials; Asbestos in Soils/Sediments (fibre screening and identification)

This report refers to samples as received, and QTS Environmental Ltd, takes no responsibility for the accuracy or competence of sampling by others.

The material description shall be regarded as tentative and is not included in our scope of UKAS Accreditation.

Opinions and interpretations expressed herein are outside the scope of UKAS Accreditation.

Asbestos Analyst: Graham Revell

RL: Reporting Limit

Pinch Test: Where pinch test is positive it is reported "Loose Fibres - PT" with type(s).

Subcontracted analysis (S)

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| Soil Analysis Certificate - Speciated PAHs | | | | | | |
|---|---|---|---|---|---|---|
| **QTS Environmental Report No: 16-42402** | **Date Sampled** | None Supplied | | | | |
| **Site Analytical Services Ltd** | **Time Sampled** | None Supplied | | | | |
| **Site Reference: 115-119 Goldhurst** | **TP / BH No** | WS2 | | | | |
| **Project / Job Ref: 16/24927** | **Additional Refs** | None Supplied | | | | |
| **Order No: 22625** | **Depth (m)** | 1.00 | | | | |
| **Reporting Date: 06/04/2016** | **QTSE Sample No** | 199189 | | | | |

| Determinand | Unit | RL | Accreditation | | | | | |
|---|---|---|---|---|---|---|---|---|
| Naphthalene | mg/kg | < 0.1 | MCERTS | < 0.1 | | | | |
| Acenaphthylene | mg/kg | < 0.1 | MCERTS | < 0.1 | | | | |
| Acenaphthene | mg/kg | < 0.1 | MCERTS | < 0.1 | | | | |
| Fluorene | mg/kg | < 0.1 | MCERTS | < 0.1 | | | | |
| Phenanthrene | mg/kg | < 0.1 | MCERTS | < 0.1 | | | | |
| Anthracene | mg/kg | < 0.1 | MCERTS | < 0.1 | | | | |
| Fluoranthene | mg/kg | < 0.1 | MCERTS | < 0.1 | | | | |
| Pyrene | mg/kg | < 0.1 | MCERTS | < 0.1 | | | | |
| Benzo(a)anthracene | mg/kg | < 0.1 | MCERTS | < 0.1 | | | | |
| Chrysene | mg/kg | < 0.1 | MCERTS | < 0.1 | | | | |
| Benzo(b)fluoranthene | mg/kg | < 0.1 | MCERTS | < 0.1 | | | | |
| Benzo(k)fluoranthene | mg/kg | < 0.1 | MCERTS | < 0.1 | | | | |
| Benzo(a)pyrene | mg/kg | < 0.1 | MCERTS | < 0.1 | | | | |
| Indeno(1,2,3-cd)pyrene | mg/kg | < 0.1 | MCERTS | < 0.1 | | | | |
| Dibenz(a,h)anthracene | mg/kg | < 0.1 | MCERTS | < 0.1 | | | | |
| Benzo(ghi)perylene | mg/kg | < 0.1 | MCERTS | < 0.1 | | | | |
| Coronene | mg/kg | < 0.1 | NONE | < 0.1 | | | | |
| Total Oily Waste PAHs | mg/kg | < 1 | MCERTS | < 1 | | | | |
| Total Dutch 10 PAHs | mg/kg | < 1 | MCERTS | < 1 | | | | |
| Total EPA-16 PAHs | mg/kg | < 1.6 | MCERTS | < 1.6 | | | | |
| Total WAC-17 PAHs | mg/kg | < 1.7 | NONE | < 1.7 | | | | |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30$^{o}$C

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| Soil Analysis Certificate - TPH CWG Banded | | | | | | |
|---|---|---|---|---|---|---|
| **QTS Environmental Report No: 16-42402** | **Date Sampled** | None Supplied | | | | |
| **Site Analytical Services Ltd** | **Time Sampled** | None Supplied | | | | |
| **Site Reference: 115-119 Goldhurst** | **TP / BH No** | WS2 | | | | |
| **Project / Job Ref: 16/24927** | **Additional Refs** | None Supplied | | | | |
| **Order No: 22625** | **Depth (m)** | 1.00 | | | | |
| **Reporting Date: 06/04/2016** | **QTSE Sample No** | 199189 | | | | |

| Determinand | Unit | RL | Accreditation | | | | | |
|---|---|---|---|---|---|---|---|---|
| Aliphatic >C5 - C6 | mg/kg | < 0.01 | NONE | < 0.01 | | | | |
| Aliphatic >C6 - C8 | mg/kg | < 0.05 | NONE | < 0.05 | | | | |
| Aliphatic >C8 - C10 | mg/kg | < 2 | MCERTS | < 2 | | | | |
| Aliphatic >C10 - C12 | mg/kg | < 2 | MCERTS | < 2 | | | | |
| Aliphatic >C12 - C16 | mg/kg | < 3 | MCERTS | < 3 | | | | |
| Aliphatic >C16 - C21 | mg/kg | < 3 | MCERTS | < 3 | | | | |
| Aliphatic >C21 - C34 | mg/kg | < 10 | MCERTS | < 10 | | | | |
| Aliphatic (C5 - C34) | mg/kg | < 21 | NONE | < 21 | | | | |
| Aromatic >C5 - C7 | mg/kg | < 0.01 | NONE | < 0.01 | | | | |
| Aromatic >C7 - C8 | mg/kg | < 0.05 | NONE | < 0.05 | | | | |
| Aromatic >C8 - C10 | mg/kg | < 2 | MCERTS | < 2 | | | | |
| Aromatic >C10 - C12 | mg/kg | < 2 | MCERTS | < 2 | | | | |
| Aromatic >C12 - C16 | mg/kg | < 2 | MCERTS | < 2 | | | | |
| Aromatic >C16 - C21 | mg/kg | < 3 | MCERTS | < 3 | | | | |
| Aromatic >C21 - C35 | mg/kg | < 10 | MCERTS | < 10 | | | | |
| Aromatic (C5 - C35) | mg/kg | < 21 | NONE | < 21 | | | | |
| Total >C5 - C35 | mg/kg | < 42 | NONE | < 42 | | | | |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30$^{O}$C

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| Soil Analysis Certificate - BTEX / MTBE | | | | | | |
|---|---|---|---|---|---|---|
| **QTS Environmental Report No: 16-42402** | **Date Sampled** | None Supplied | | | | |
| **Site Analytical Services Ltd** | **Time Sampled** | None Supplied | | | | |
| **Site Reference: 115-119 Goldhurst** | **TP / BH No** | WS2 | | | | |
| **Project / Job Ref: 16/24927** | **Additional Refs** | None Supplied | | | | |
| **Order No: 22625** | **Depth (m)** | 1.00 | | | | |
| **Reporting Date: 06/04/2016** | **QTSE Sample No** | 199189 | | | | |

| Determinand | Unit | RL | Accreditation | | | | | |
|---|---|---|---|---|---|---|---|---|
| Benzene | ug/kg | < 2 | MCERTS | < 2 | | | | |
| Toluene | ug/kg | < 5 | MCERTS | < 5 | | | | |
| Ethylbenzene | ug/kg | < 2 | MCERTS | < 2 | | | | |
| p & m-xylene | ug/kg | < 2 | MCERTS | < 2 | | | | |
| o-xylene | ug/kg | < 2 | MCERTS | < 2 | | | | |
| MTBE | ug/kg | < 5 | MCERTS | < 5 | | | | |

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30$^{O}$C

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## Waste Acceptance Criteria Analytical Certificate - BS EN 12457/3

| | | | | | Landfill Waste Acceptance Criteria Limits | | |
|---|---|---|---|---|---|---|---|
| **QTS Environmental Report No: 16-42402** | **Date Sampled** | None Supplied | | | **Inert Waste Landfill** | **Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill** | **Hazardous Waste Landfill** |
| **Site Analytical Services Ltd** | **Time Sampled** | None Supplied | | | | | |
| **Site Reference: 115-119 Goldhurst** | **TP / BH No** | WS2 | | | | | |
| **Project / Job Ref: 16/24927** | **Additional Refs** | None Supplied | | | | | |
| **Order No: 22625** | **Depth (m)** | 1.00 | | | | | |
| **Reporting Date: 06/04/2016** | **QTSE Sample No** | 199189 | | | | | |

| **Determinand** | **Unit** | **MDL** | | | | | | |
|---|---|---|---|---|---|---|---|---|
| TOC[MU] | % | < 0.1 | 0.1 | | | 3% | 5% | 6% |
| Loss on Ignition | % | < 0.01 | 1.60 | | | -- | -- | 10% |
| BTEX[MU] | mg/kg | < 0.05 | < 0.05 | | | 6 | -- | -- |
| Sum of PCBs | mg/kg | < 0.1 | < 0.1 | | | 1 | -- | -- |
| Mineral Oil[MU] | mg/kg | < 10 | < 10 | | | 500 | -- | -- |
| Total PAH[MU] | mg/kg | < 1.7 | < 1.7 | | | 100 | -- | -- |
| pH[MU] | pH Units | N/a | 8.0 | | | -- | >6 | -- |
| Acid Neutralisation Capacity | mol/kg (+/-) | < 1 | < 1 | | | -- | To be evaluated | To be evaluated |

| **Eluate Analysis** | **2:1 mg/l** | **8:1 mg/l** | | **Cumulative 10:1 mg/kg** | **Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg (mg/kg)** | | |
|---|---|---|---|---|---|---|---|
| Arsenic[U] | < 0.01 | < 0.01 | | < 0.2 | 0.5 | 2 | 25 |
| Barium[U] | 0.16 | 0.07 | | 0.8 | 20 | 100 | 300 |
| Cadmium[U] | < 0.0005 | < 0.0005 | | < 0.02 | 0.04 | 1 | 5 |
| Chromium[U] | < 0.005 | < 0.005 | | < 0.20 | 0.5 | 10 | 70 |
| Copper[U] | < 0.01 | < 0.01 | | < 0.5 | 2 | 50 | 100 |
| Mercury[U] | < 0.005 | < 0.005 | | < 0.01 | 0.01 | 0.2 | 2 |
| Molybdenum[U] | < 0.001 | < 0.001 | | < 0.1 | 0.5 | 10 | 30 |
| Nickel[U] | < 0.007 | < 0.007 | | < 0.2 | 0.4 | 10 | 40 |
| Lead[U] | < 0.005 | < 0.005 | | < 0.2 | 0.5 | 10 | 50 |
| Antimony[U] | < 0.005 | < 0.005 | | < 0.06 | 0.06 | 0.7 | 5 |
| Selenium[U] | < 0.005 | < 0.005 | | < 0.1 | 0.1 | 0.5 | 7 |
| Zinc[U] | 0.020 | < 0.005 | | < 0.2 | 4 | 50 | 200 |
| Chloride[U] | 5 | 2 | | 20 | 800 | 15000 | 25000 |
| Fluoride[U] | 0.7 | 0.9 | | 9.2 | 10 | 150 | 500 |
| Sulphate[U] | 694 | 141 | | 1650 | **1000** | 20000 | 50000 |
| TDS | 834 | 262 | | 2872 | 4000 | 60000 | 100000 |
| Phenol Index | < 0.01 | < 0.01 | | < 0.5 | 1 | - | - |
| DOC | 4.3 | 2.3 | | 24.3 | 500 | 800 | 1000 |
| **Leach Test Information** | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| Sample Mass (kg) | 0.22 | | | | | | |
| Dry Matter (%) | 79 | | | | | | |
| Moisture (%) | 26.6 | | | | | | |
| **Stage 1** | | | | | | | |
| Volume Eluate L2 (litres) | 0.30 | | | | | | |
| Filtered Eluate VE1 (litres) | 0.08 | | | | | | |
| | | | | | | | |
| | | | | | | | |

Results are expressed on a dry weight basis, after correction for moisture content where applicable
Stated limits are for guidance only and QTS Environmental cannot be held responsible for any discrepencies with current legislation
M Denotes MCERTS accredited test
U Denotes ISO17025 accredited test

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| Soil Analysis Certificate - Sample Descriptions | |
|---|---|
| QTS Environmental Report No: 16-42402 | |
| Site Analytical Services Ltd | |
| Site Reference: 115-119 Goldhurst | |
| Project / Job Ref: 16/24927 | |
| Order No: 22625 | |
| Reporting Date: 06/04/2016 | |

| QTSE Sample No | TP / BH No | Additional Refs | Depth (m) | Moisture Content (%) | Sample Matrix Description |
|---|---|---|---|---|---|
| ^ 199189 | WS2 | None Supplied | 1.00 | 21 | Brown clay |

*Moisture content is part of procedure E003 & is not an accredited test*
Insufficient Sample I/S
Unsuitable Sample U/S
^ no sampling date provided; unable to confirm if samples are within acceptable holding times

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| **Soil Analysis Certificate - Methodology & Miscellaneous Information** |
|---|
| **QTS Environmental Report No: 16-42402** |
| **Site Analytical Services Ltd** |
| **Site Reference: 115-119 Goldhurst** |
| **Project / Job Ref: 16/24927** |
| **Order No: 22625** |
| **Reporting Date: 06/04/2016** |

| Matrix | Analysed On | Determinand | Brief Method Description | Method No |
|---|---|---|---|---|
| Soil | D | Boron - Water Soluble | Determination of water soluble boron in soil by 2:1 hot water extract followed by ICP-OES | E012 |
| Soil | AR | BTEX | Determination of BTEX by headspace GC-MS | E001 |
| Soil | D | Cations | Determination of cations in soil by aqua-regia digestion followed by ICP-OES | E002 |
| Soil | D | Chloride - Water Soluble (2:1) | Determination of chloride by extraction with water & analysed by ion chromatography | E009 |
| Soil | AR | Chromium - Hexavalent | Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry | E016 |
| Soil | AR | Cyanide - Complex | Determination of complex cyanide by distillation followed by colorimetry | E015 |
| Soil | AR | Cyanide - Free | Determination of free cyanide by distillation followed by colorimetry | E015 |
| Soil | AR | Cyanide - Total | Determination of total cyanide by distillation followed by colorimetry | E015 |
| Soil | D | Cyclohexane Extractable Matter (CEM) | Gravimetrically determined through extraction with cyclohexane | E011 |
| Soil | AR | Diesel Range Organics (C10 - C24) | Determination of hexane/acetone extractable hydrocarbons by GC-FID | E004 |
| Soil | AR | Electrical Conductivity | Determination of electrical conductivity by addition of saturated calcium sulphate followed by electrometric measurement | E022 |
| Soil | AR | Electrical Conductivity | Determination of electrical conductivity by addition of water followed by electrometric measurement | E023 |
| Soil | D | Elemental Sulphur | Determination of elemental sulphur by solvent extraction followed by GC-MS | E020 |
| Soil | AR | EPH (C10 – C40) | Determination of acetone/hexane extractable hydrocarbons by GC-FID | E004 |
| Soil | AR | EPH Product ID | Determination of acetone/hexane extractable hydrocarbons by GC-FID | E004 |
| Soil | AR | EPH TEXAS (C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C40) | Determination of acetone/hexane extractable hydrocarbons by GC-FID for C8 to C40. C6 to C8 by headspace GC-MS | E004 |
| Soil | D | Fluoride - Water Soluble | Determination of Fluoride by extraction with water & analysed by ion chromatography | E009 |
| Soil | D | FOC (Fraction Organic Carbon) | Determination of fraction of organic carbon by oxidising with potassium dichromate followed by titration with iron (II) sulphate | E010 |
| Soil | D | Loss on Ignition @ 450oC | Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace | E019 |
| Soil | D | Magnesium - Water Soluble | Determination of water soluble magnesium by extraction with water followed by ICP-OES | E025 |
| Soil | D | Metals | Determination of metals by aqua-regia digestion followed by ICP-OES | E002 |
| Soil | AR | Mineral Oil (C10 - C40) | Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge | E004 |
| Soil | AR | Moisture Content | Moisture content; determined gravimetrically | E003 |
| Soil | D | Nitrate - Water Soluble (2:1) | Determination of nitrate by extraction with water & analysed by ion chromatography | E009 |
| Soil | D | Organic Matter | Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate | E010 |
| Soil | AR | PAH - Speciated (EPA 16) | Determination of PAH compounds by extraction in acetone and hexane followed by GC-MS with the use of surrogate and internal standards | E005 |
| Soil | AR | PCB - 7 Congeners | Determination of PCB by extraction with acetone and hexane followed by GC-MS | E008 |
| Soil | D | Petroleum Ether Extract (PEE) | Gravimetrically determined through extraction with petroleum ether | E011 |
| Soil | AR | pH | Determination of pH by addition of water followed by electrometric measurement | E007 |
| Soil | AR | Phenols - Total (monohydric) | Determination of phenols by distillation followed by colorimetry | E021 |
| Soil | D | Phosphate - Water Soluble (2:1) | Determination of phosphate by extraction with water & analysed by ion chromatography | E009 |
| Soil | D | Sulphate (as SO4) - Total | Determination of total sulphate by extraction with 10% HCl followed by ICP-OES | E013 |
| Soil | D | Sulphate (as SO4) - Water Soluble (2:1) | Determination of sulphate by extraction with water & analysed by ion chromatography | E009 |
| Soil | D | Sulphate (as SO4) - Water Soluble (2:1) | Determination of water soluble sulphate by extraction with water followed by ICP-OES | E014 |
| Soil | AR | Sulphide | Determination of sulphide by distillation followed by colorimetry | E018 |
| Soil | D | Sulphur - Total | Determination of total sulphur by extraction with aqua-regia followed by ICP-OES | E024 |
| Soil | AR | SVOC | Determination of semi-volatile organic compounds by extraction in acetone and hexane followed by GC-MS | E006 |
| Soil | AR | Thiocyanate (as SCN) | Determination of thiocyanate by extraction in caustic soda followed by acidification followed by addition of ferric nitrate followed by colorimetry | E017 |
| Soil | D | Toluene Extractable Matter (TEM) | Gravimetrically determined through extraction with toluene | E011 |
| Soil | D | Total Organic Carbon (TOC) | Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate | E010 |
| Soil | AR | TPH CWG (ali: C5- C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C34, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35) | Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C35. C5 to C8 by headspace GC-MS | E004 |
| Soil | AR | TPH LQM (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C35, C35-C44, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35, C35-C44) | Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C44. C5 to C8 by headspace GC-MS | E004 |
| Soil | AR | VOCs | Determination of volatile organic compounds by headspace GC-MS | E001 |
| Soil | AR | VPH (C6-C8 & C8-C10) | Determination of hydrocarbons C6-C8 by headspace GC-MS & C8-C10 by GC-FID | E001 |

**D Dried**
**AR As Received**

# APPENDIX `C'

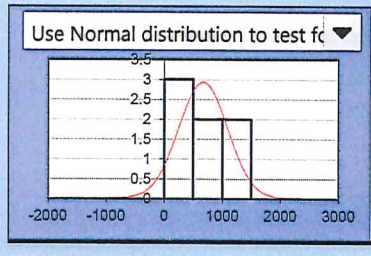
## Statistical Analysis

# Test Results

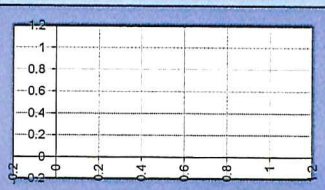
Client/client ref: 115-119 Goldhu Site ref:
Project ref: 16/24927 Data description:

Date: 03-May-2016
User details: A Davidson

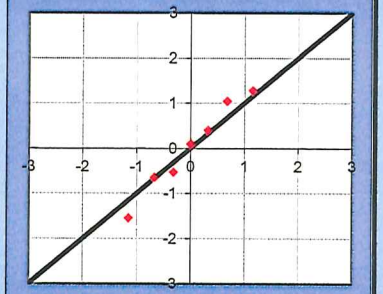
| Dataset: | Pb |
|---|---|
| Sample mean, $\overline{x}$ | 667.71 |
| Sample standard deviation, s | 419.11 |
| Sample size, n | 7 |
| Critical concentration, Cc | 200 |



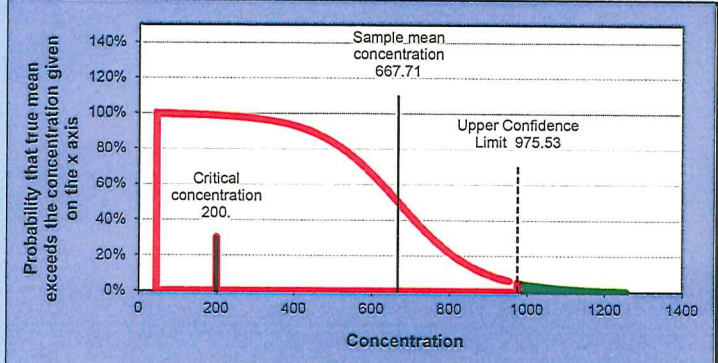

| Outliers & non-detects | |
|---|---|
| Outliers present? | NO |
| Significance level | 5% |
| Outliers removed? | 0 |
| Non-detects | 0 |




| Normality test | |
|---|---|
| Significance level: | 5% |
| Normal distribution | |
| Use: | Auto: One-sample t-test |




| Test scenario: | Planning: is true mean lower than critical concentration (μ < Cc)? |
|---|---|
| Null hypothesis: | The true mean concentration is equal to or greater than the critical concentration: μ ≥ Cc |
| Alternative hypothesis: | The true mean concentration is less than the critical concentration: μ < Cc |




| Evidence against Null hypothesis: | 1% |
|---|---|
| Base decision on: | evidence level |
| Evidence level required: | 95% |
| Balance of probability? | N/A |
| Reject Null Hypothesis? | No |
| μ ≥ Cc | |

Back to data | Back to summary | Go to outlier test | Go to normality test

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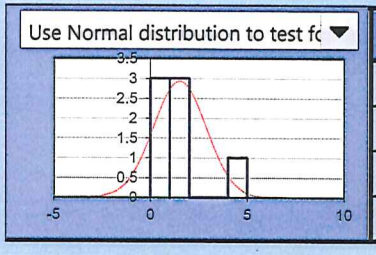
# Test Results

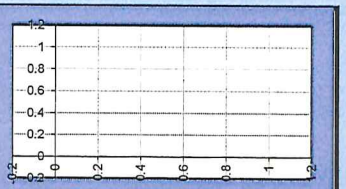
Client/client ref: 115-119 Goldhu Site ref:
Project ref: 16/24927 Data description:

Date: 03-May-2016
User details: A Davidson

| Dataset: | BbF |
|---|---|
| Sample mean, $\overline{x}$ | 1.5043 |
| Sample standard deviation, s | 1.3601 |
| Sample size, n | 7 |
| Critical concentration, Cc | 3.3 |




| Outliers & non-detects | |
|---|---|
| Outliers present? | YES |
| Significance level | 5% |
| Outliers removed? | 0 |
| Non-detects | 1 |

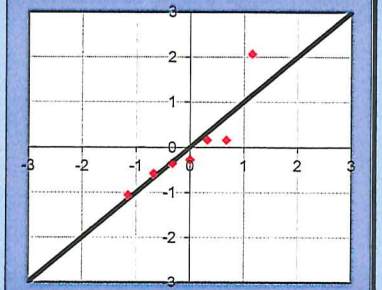


## Normality test

Significance level: 5%

Normal distribution

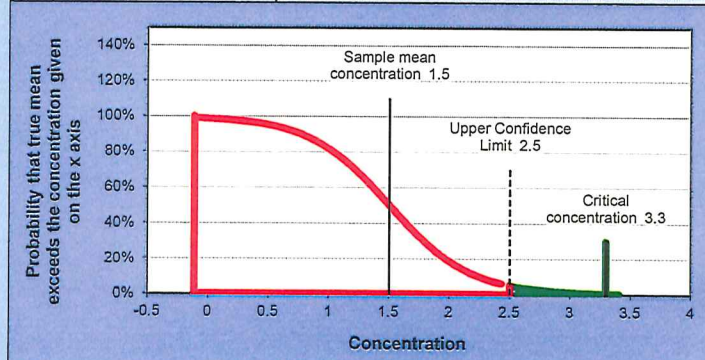
Use: Auto: One-sample t-test



## Test scenario: Planning: is true mean lower than critical concentration (μ < Cc)?

Null hypothesis: The true mean concentration is equal to or greater than the critical concentration: μ ≥ Cc

Alternative hypothesis: The true mean concentration is less than the critical concentration: μ < Cc




| Evidence against Null hypothesis: | 99% |
|---|---|
| Base decision on: | evidence level |
| Evidence level required: | 95% |
| Balance of probability? | N/A |
| Reject Null Hypothesis? | Yes |

**μ < Cc (re this dataset)**

Back to data | Back to summary | Go to outlier test | Go to normality test

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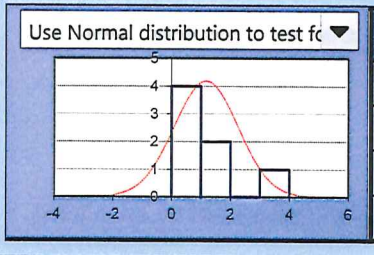
# Test Results

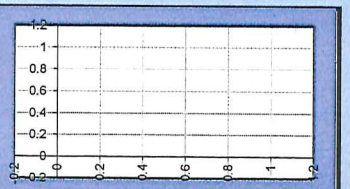
Client/client ref: 115-119 Goldhu Site ref:
Project ref: 16/24927 Data description:

Date: 03-May-2016
User details: A Davidson

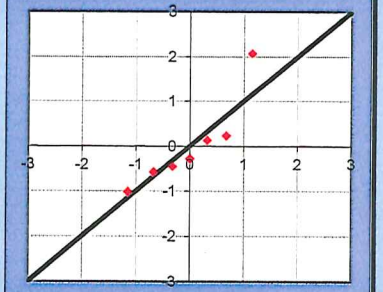
| Dataset: | BaP |
|---|---|
| Sample mean, $\overline{x}$ | 1.17 |
| Sample standard deviation, s | 1.0854 |
| Sample size, n | 7 |
| Critical concentration, Cc | 2.7 |



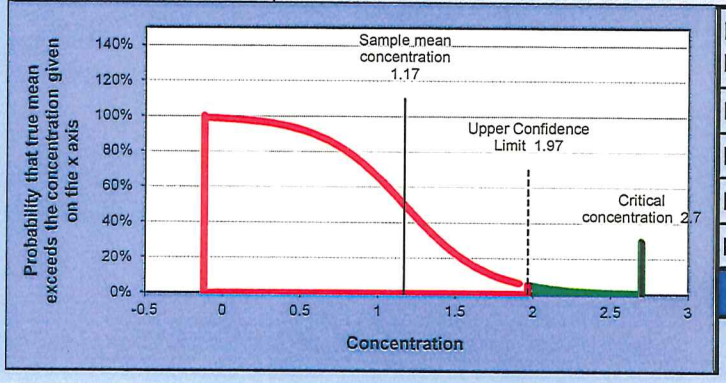

| Outliers & non-detects | |
|---|---|
| Outliers present? | YES |
| Significance level | 5% |
| Outliers removed? | 0 |
| Non-detects | 1 |



| Normality test | |
|---|---|
| Significance level: | 5% |
| Normal distribution | |
| Use: | Auto: One-sample t-test |



| Test scenario: | Planning: is true mean lower than critical concentration (μ < Cc)? |
|---|---|
| Null hypothesis: | The true mean concentration is equal to or greater than the critical concentration: μ ≥ Cc |
| Alternative hypothesis: | The true mean concentration is less than the critical concentration: μ < Cc |




| | |
|---|---|
| Evidence against Null hypothesis: | 100% |
| Base decision on: | evidence level |
| Evidence level required: | 95% |
| Balance of probability? | N/A |
| Reject Null Hypothesis? | Yes |

**μ < Cc (re this dataset)**

Back to data | Back to summary | Go to outlier test | Go to normality test

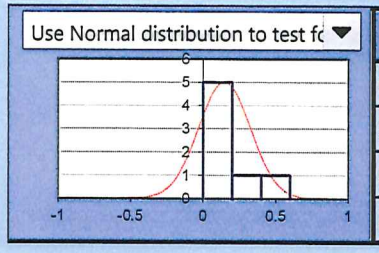
Site Analytical Services Ltd.

# Test Results

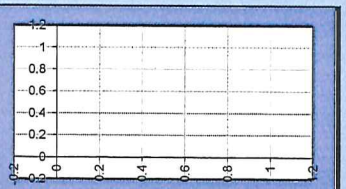
Client/client ref: 115-119 Goldhu Site ref:
Project ref: 16/24927 Data description:

Date: 03-May-2016
User details: A Davidson

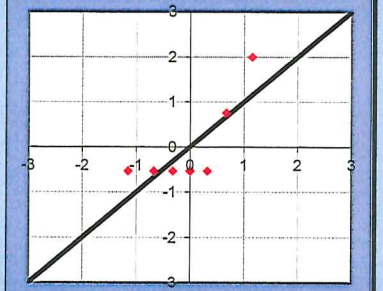
| Dataset: | DahA |
|---|---|
| Sample mean, $\overline{x}$ | 0.1471 |
| Sample standard deviation, s | 0.1776 |
| Sample size, n | 7 |
| Critical concentration, Cc | 0.28 |



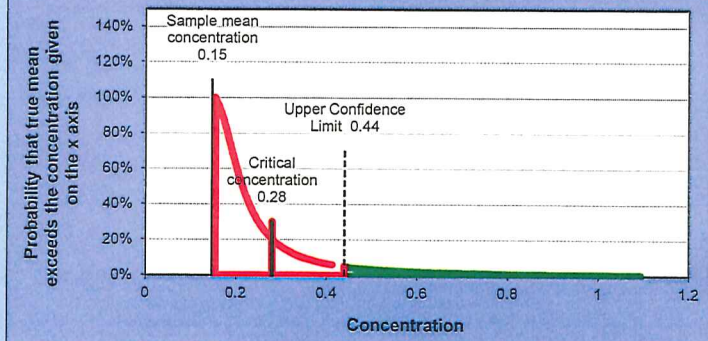

| Outliers & non-detects | |
|---|---|
| Outliers present? | YES |
| Significance level | 5% |
| Outliers removed? | 0 |
| Non-detects | 5 |



| Normality test | |
|---|---|
| Significance level: | 5% |
| Non-normal distribution | |
| Use: | Auto: Chebychev |



| Test scenario: | Planning: is true mean lower than critical concentration (μ < Cc)? |
|---|---|
| Null hypothesis: | The true mean concentration is equal to or greater than the critical concentration: μ ≥ Cc |
| Alternative hypothesis: | The true mean concentration is less than the critical concentration: μ < Cc |




| Evidence against Null hypothesis: | 80% |
|---|---|
| Base decision on: | evidence level |
| Evidence level required: | 95% |
| Balance of probability? | N/A |
| Reject Null Hypothesis? | No |

**Not enough evidence**

Back to data | Back to summary | Go to outlier test | Go to normality test

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