

Hill Residential Ltd

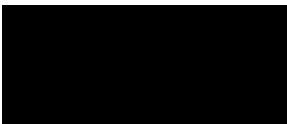
Ground Investigation

**Lucas Lane
HITCHIN
Hertfordshire
SG5 2HS**

**Report Ref: 16.07.021c
March 2025**

DOCUMENT RECORD

Report Title	Ground Investigation Report
Development	New Residential Development
Project Address	Lucas Lane, Hitchin, Hertfordshire SG5 2HS
Project Ref	16.07.021c
Client	Hill Residential Ltd

	<u>Signature</u>	<u>Name and Qualifications</u>
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For and on behalf of ListersGeo, trading name of Listers Geotechnical Consultants Ltd

Issue No	Date	Status
1	13 October 2016	Draft (as 16.07.021)
2	4 November 2016	Final, with minor textual changes (as 16.07.021)
3	22 October 2021	Revised for latest development proposal and updated with new environmental searches and site walkover
4	25 November 2021	Minor textual changes
5	19 January 2022	Minor change to site boundary
6	19 December 2024	Revised proposed site plan
7	10 th March 2025	Updated environmental desk study data and addendum woodland investigation
8	13 th March 2025	Final Report

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EXECUTIVE SUMMARY

Project Reference	16.07.021
Site Location	Lucas Lane, Hitchin, Hertfordshire, SG5 2HS
OS Grid Reference	517494, 229220
Development Proposals	The current indicative proposal is for nine two-storey houses, with associated garages, private gardens and driveways, a new access road and areas of public open space
Existing Buildings	There are no buildings on site, which appears to be a fallow field
Topography	Generally flat, with a fall of 3m down towards the west
Vegetation	Dense vegetative cover over the north-western corner and intermittent hedgerows around the boundaries. The rest of the site has a cover of rough grass
Published Geology	The site lies above a deep glacial channel; underlain by Superficial Glaciofluvial and Glacial Channel Deposits above the bedrock West Melbury Marly Chalk
Site History	Agricultural fields since late part of nineteenth century until, recently, left fallow. No nearby industrial history other than some mineral extraction. Anecdotal evidence of 'farmer's pit' in the densely vegetated area of the site
Hydrology	No rivers within 500m or surface water features within 250m. The nearest surface water abstraction license is 943m south-east
Hydrogeology	On a Secondary 'A' Aquifer, the Glaciofluvial Deposits, underlain by a Principal Aquifer, the West Melbury Marly Chalk
Geotechnical Hazards	Very low risk of dissolution features. Risk of compressible ground within backfilled pit. Risk of soil movements in response to seasonal and vegetation-induced moisture content changes
Ground Conditions Encountered	Localised Made Ground (pit area only); Glaciofluvial Deposits; Glacial Channel Deposits. The bedrock West Melbury Marly Chalk Formation was not encountered at the maximum depth of investigation, of 15.00m bgl
Groundwater Encountered	Groundwater was not encountered
Ground Contamination	No significant contamination based on a residential end use with homegrown produce in the gardens and public open space-residential in the woodland.
Groundwater Contamination	No significant contamination risk anticipated
Site Remediation	No remediation requirement anticipated
Foundations	Spread foundations on naturally-deposited soils may suffice but piled foundations might be necessary where vegetation is a significant influence
Safe Bearing Pressure	140kPa for strip footings $\leq 1.00\text{m}$ width; or square pad foundations $\leq 3.0\text{m}$ width
Floor Slabs	Provisionally ground bearing in association with spread foundations but suspended in association with pile foundations
Soil Gases	None affecting the site
Waste Soil Classification	All non-organic soils from this site can be disposed as inert waste. Topsoil is likely to classify as non-hazardous
Chemical Attack on Buried Concrete	Design Sulphate Class DS-1 ACEC Class AC-1s for spread foundations and AC-1 for piles
Pavement Design	CBR value of 4.7% on the Glaciofluvial Deposits and 1% on Made Ground
Soakaways	Shallow soakaways unlikely to perform well. Consideration could be given to borehole soakaways
Further Work	Continued groundwater monitoring to record the range of seasonal variations. If the use of borehole soakaways emptying into the coarse-grained Glaciofluvial Deposits is to be further considered, then infiltration testing in the existing standpipes is recommended, as a guide to performance.

This executive summary should be read in conjunction with the main report.

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UPDATED GROUND INVESTIGATION REPORT

INTRODUCTION

An updated Phase 1 (Desk Study) investigation with additional investigation on the existing woodland has been undertaken (to supplement previous desk study and intrusive works), for a proposed new residential development on land adjoining Lucas Lane, Hitchin, Hertfordshire, SG5 2HS. A Site Location Plan is provided in Appendix A.

The Ordnance Survey National Grid reference for the approximate centre of the site is 517494, 229220.

Instruction to undertake the investigation was received from Hill Residential Ltd, in an email of the 29th January 2025.

This report describes the desk study and ground investigations carried out by ListersGeo in order to provide an evaluation of the ground conditions and the extent of any soil contamination present on the site. The report presents initial human health and groundwater risk assessments based on the findings of the desk and intrusive works and subsequent laboratory testing. The report also discusses the geotechnical implications with regard to the proposed development based on the findings of this investigation.

The site was the subject of a previous combined, Phase 1 (Desk Study) and Phase 2 (Intrusive) Investigation, by ListersGeo for the same client, (reference 16.07.021, dated October 2016).

This original Ground Investigation report was later revised for some updated development proposal and updated with new environmental searches and site walkover under report reference 16.07.021a dated October 2021. The report was again reissued in December 2024 under report reference 16.07.021a.

Given the time that has passed since the last update of the desk study (2021), and as additional testing was required within the woodland in the northwest of the site, this updated report reference 16.07.021c, is an update of the Phase 1 investigation, using new environmental searches and site walkover and the other data from the previous investigation. Therefore, some appendix items have retained the project number from the previous investigations.

There is no 16.07.021b report, rather 16.07.021b was used internally by ListersGeo, for the reissue of 16.07.021a report in December 2024.

A revised geotechnical desk study to identify risks relating to mining etc is outside the scope of this investigation.

This report has been prepared for the sole use of the client and their professional advisors. This report shall not be relied upon by third parties without the express written authority of ListersGeo. If an unauthorised third-party comes into possession of this report, they must not rely on it and the authors owe them no duty of care and skill.

SCOPE OF THE INVESTIGATION

The scope of the investigation was to undertake a new geoenvironmental desk study, walkover survey and additional investigation within the existing woodland, to provide an assessment of the potential geotechnical engineering properties of the ground and the potential extent of soil contamination on the site, as well present the findings of the previously undertaken waste classification of the soils present at the site. This report combines and relies on the findings of both this and the previously undertaken ListersGeo investigations on the site.

PROPOSALS

The proposal is for private residential housing with gardens, an access road, driveways and open space. No details of likely structural loads have been provided but are assumed to be typical of two- to two-and-a-half-storey housing. Furthermore it is understood that the northwestern area of site will be utilised as a communal open space (woodland). An indicative proposal plan is included in Appendix A.

The contaminated land risk assessment has been prepared to aid with the discharge of Condition 7 (a) i, ii, (b), (c), i, ii and (d) of Planning Permission reference 22/00516/FP LAND TO THE WEST OF LUCAS LANE AND EAST OF HEADLANDS, GRAYS LANE, HITCHIN, HERTFORDSHIRE, SG5 2HR.

SITE INFORMATION AND RECONNAISSANCE

The site, which is approximately rectangular on plan, is bounded by: Lucas Lane to the east; Gray's Lane to the south; a residential property (Headlands) to the west, and a care home (No.1 Lavender Fields) to the north.

The site extends some 85m along Lucas Lane and 110m along Gray's Lane, and covers an area of around 0.80ha.

The site is on the western flank of Hitchin, approximately 900m west of the town centre, with residential properties to the east and, beyond the adjacent house (west) and care home (north), agricultural land and a sports field in the other directions.

The site is on an elongate ridge of high ground, between valleys to the west and east, with a maximum elevation of approximately 93m AOD (above Ordnance Datum). The floor of the valley to the west is, at the closest, approximately 700m to the north-west and is occupied by the headwaters of the River Oughton, a tributary of the River Hiz, which is within the valley to the west of the site. The land around the site slopes, in general, down towards the west and the east (either side of the site) but there is a marked depression immediately to the west of the site, running for some 80m in that direction. The site itself is generally flat, with a gentle slope down towards the west and a fall, in that direction, of around 3.0m.

The north-western corner of the site has a dense cover of trees and undergrowth, and the remaining boundaries are marked by hedgerows of trees and bushes. The remainder of the site has a cover of tall grass and sparse scrub and meadow vegetation.

Within the densely vegetated area, on the western side of the site, the undergrowth made observation difficult, but it was possible to discern a few features of note: set towards the south-eastern corner of the area was a depression, approximately circular on plan, and, to the west of this, a shallow, narrow, ditch approximately 2m wide by 0.3m deep and around 10m long. North of the circular depression the ground rose more steeply and contained the remains of two galvanised metal containers. The containers were approximately cuboid; 0.3m wide; corroded and empty. It was not possible to discern their former function. The location of these features is discussed further within the following section.

There was no evidence, elsewhere on site, of any fly-tipping or contaminative sources and all of the vegetation appeared to be in a healthy state. Similarly, the surrounding land-uses did not appear to present any on-going risk of contamination to the site.

There were no significant changes evident between the three site walkovers. The site and surrounds were, essentially, as recorded in our previous report and there was no evidence of new potential sources of significant contamination that could affect the site.

DESK STUDY AND BACKGROUND INFORMATION

A desk study review of the site and its history has been undertaken to assess the former land usage and the potential for any historically-derived sources of chemical contamination, as well as provide information to aid our geotechnical assessment.

The information provided in the desk study is obtained from independent third-party sources. We have relied on this information, but no guarantee can be given for the accuracy or completeness of the third-party data used. It should be appreciated that such data is not exhaustive and is constantly being updated and reviewed in light of new information and procedures. Therefore, improved practices, technology and new information may affect our conclusions and hence this report should be referred back to us for reassessment if new data comes to light, or changes in legislation/best practise is identified prior to development. Similarly, should the development commence more than one year from publication of this report, then we recommend this report is referred back to us for reassessment.

A copy of the desk study information obtained from Groundsure is presented in Appendix G of this report.

The desk study comprises a review of data compiled from multiple organisations and information sources, including:

- Ordnance Survey
- Environment Agency (EA)
- Local Authority
- Natural England
- UK Health Security Agency (UKHSA)
- Centre for Ecology & Hydrology
- Contemporary Trade Directories
- The Coal Authority
- British Geological Survey (BGS), National Geoscience Information Service
- Arup and Stantec
- Aerial Imagery

Information from the above-referenced sources has been utilised to develop an initial conceptual model of the site for use in the contamination source-pathway-receptor risk assessment an initial ground model for use in the geotechnical appraisal.

GEOLOGY

Published Geology

Reference to the British Geological Survey 1:50,000-scale map and other published geological information on the area indicates that the site lies above a deep glacial channel and is underlain by Superficial Glaciofluvial and Glacial Channel Deposits above the bedrock West Melbury Marly Chalk Formation.

The West Melbury Marly Chalk is thought to lie between 30m and 60m below the site.

Artificial Ground

There are three records of Artificial Ground within 500m of the site. The nearest is on-site, within the vegetated area, and continues westwards from there as the area of obviously lower elevation extending some 80m west of the site. This is recorded as a void and likely resulted from mineral extraction with little or no subsequent backfilling. The two other records within 500m are areas of Made Ground 87m and 380m north of the site and these represent the construction of the sports fields seen there during the walkover.

Superficial

The glacial deposits comprise interbedded and interleaved fine and coarse soils.

Bedrock

The BGS reports the West Melbury Marly Chalk Formation to comprise, “*Buff, grey and off-white, soft, marly chalk and hard grey limestone arranged in couplets*”. The BGS approximates that the top of the bedrock lies around 30m to 60m below general site level (increasing northwards). The West Melbury Marly Chalk is likely to be a maximum of 30m thick in this area, but it is difficult to judge what thickness might lie beneath the site. The West Melbury Marly Chalk is underlain by the Gault Formation – likely to comprise in excess of 50m of stiff clay.

Solution Features

Chalk, as a calcium-carbonate rich rock, is highly susceptible to dissolution by water containing carbon dioxide. This dissolution can create three common types of features within the chalk, grouped together under the generic term ‘dissolution features’. These features include:

Sinkholes	Depressions at the ground surface caused by the collapse of overlying chalk or superficial deposits into underground voids created by dissolution. The shape and size are dependent on the underlying void feature.
Solution pipes	A feature in the surface of the chalk caused by increased dissolution in an area of closely spaced discontinuities. These features may, or may not, have a ground surface expression. They occur up to 20m in diameter, though are commonly much smaller.
Swallow Holes	A void within the surface of the chalk where a stream is ‘swallowed’ by the chalk to flow underground. They often occur at the junction of impermeable strata and chalk. Infilled ancient swallow holes do exist where streams used to flow and may not have any surface expression. They can occur up to 14m in diameter, though commonly a few metres.

Deneholes and Chalk Mines

In addition to the above natural cavities found within chalk strata, man-made cavities, such as deneholes or chalk mines, can also be encountered. Deneholes are produced by ancient chalk mining for flint and are commonly vertical shafts excavated through any overburden material and undermined at the base, similar to bell-pits in coal mining areas. Chalk Mines are more modern and are excavated in a similar way to coal mines. Both are often insufficiently backfilled, initiating collapse at a later date. They are seldom found in areas with a high water table.

Although the site is thought to be underlain by a chalk stratum (the West Melbury Marly Chalk) this formation has relatively low carbonate content.

The likelihood of chalk solution-related cavities developing is recorded as Rare. The recorded mineral extraction at (and beyond) the western end of the site and the associated ground depression there likely relates to shallow extraction of coarse soils rather than chalk. The presence, beneath the site, of a deep glacial channel can only serve to further reduce the likelihood of such features developing and is also a mitigating factor against the presence of chalk mines beneath the site.

Historical Boreholes

There are no British Geological Survey archive boreholes within 250m of the site.

BACKGROUND SOIL CHEMISTRY

The table below summarises BGS estimates of the background levels, in the natural (rural) soils, of the heavy metals listed:

Contaminant	Level (mg/kg)
Arsenic	15 to 25
Cadmium	<1.8
Chromium	40 to 60
Lead	<100
Nickel	30 to 45

These concentrations are all below the generic environmental screening levels (as discussed later within this report) for a residential site.

Sulphate Bearing Strata

The West Melbury Marly Chalk Formation is not typically known to contain pyrite, or iron sulphide, which, if allowed to oxidise, can provide an aggressive chemical environment for buried concrete.

The West Melbury Marly Chalk Formation is also not known to contain gypsum, a sulphate mineral, which can provide an aggressive chemical environment for buried concrete.

HYDROLOGY

The site is within the valley of the River Hiz (a north draining tributary of the River Ivel) but lies across two catchment bodies of that river: the Hiz (downstream of Hitchin) to the east, and the Hiz (thought Hitchin) to the west. The likely direction of hydraulic flow beneath the site is, therefore, split accordingly.

The Environment Agency's Catchment Data Explorer records the Hiz (through Hitchin) to be 'heavily modified' and of generally Moderate ecological status for the latest reported period, of 2022.

There are no records of rivers within 500m or of surface water features within 250m of the site.

The following flood risks are recorded for the site:

- River or coastal waters: no records, indicating Negligible risk.
- Surface water: Negligible risk.
- Groundwater: Moderate risk

These data do not constitute a site-specific Flood Risk Assessment and we recommend further enquiries to determine if such an assessment would be required to support a development application for the site.

There is one record of historical surface water abstraction licence, some 900m south-east and extracting from the River Hiz. This is considered to be remote from the site and to be of no further note.

HYDROGEOLOGY

The groundwater vulnerability and aquifer designation data are based on geological mapping provided by the British Geological Survey.

Groundwater vulnerability is divided, by the EA, into High, Medium and Low ranks (as further detailed in the Appendix G report).

The aquifer designation is initially divided as below:

- **Superficial (Drift)** - permeable unconsolidated (loose) deposits. For example, sands and gravels
- **Bedrock** - solid permeable formations. For example, sandstone, chalk and limestone

And, for each of these, there are sub-classifications as Principal, Secondary 'A' and Secondary 'B' Aquifers and Unproductive Strata, each with a decreasing rank of importance.

The Glaciofluvial Deposits are designated as a Secondary A Aquifer, of High Vulnerability. The underlying West Melbury Marly Chalk Formation is a Principal Aquifer of High Vulnerability.

There are no records of groundwater or potable water abstraction licenses within 1km.

According to information provided by the Environment Agency the site is located within Zone 3 (Total Catchment) of a Source Protection Zones (SPZ) that is protective of a source to the west.

The Water Framework Directive for groundwater bodies records the Upper Bedford Ouse Chalk Water Body as having poor overall status at the last report period dated 2019.

HISTORY OF THE SITE

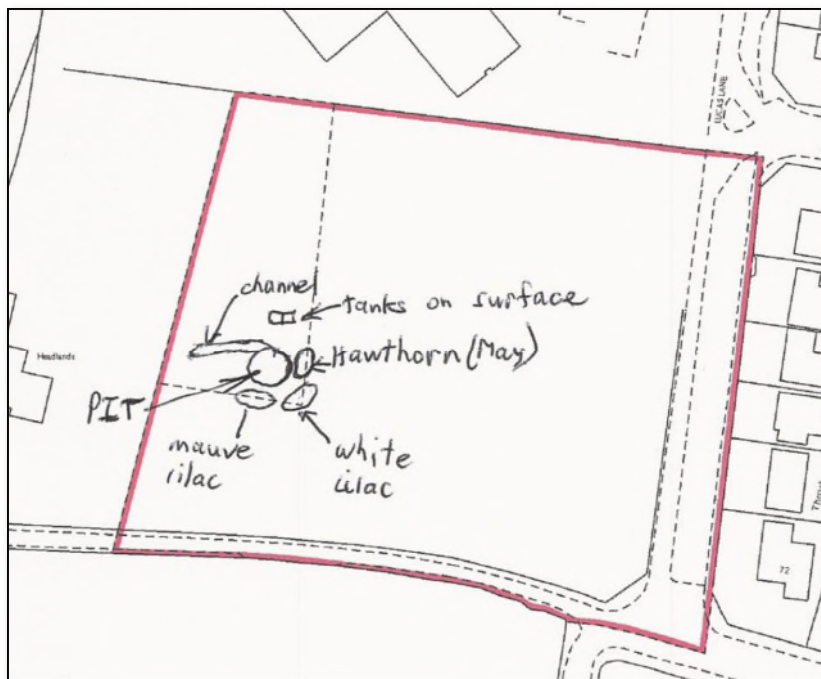
The history of the site has been assessed by reviewing historical Ordnance Survey maps and available aerial imagery, collected as part of the desk study information. This assessment provides the following details:

Map Dates	Historical Usage of the Site	Historical Usage of the Surrounding Area
1881	The site forms the south-eastern part of an agricultural field	The site is within a largely agricultural setting, with the existing lanes to the south and east and the town of Hitchin to the east, beyond agricultural fields. Gravel Pit, 100m north-west: circular on plan and about 15m across: on the edge of present-day sports field. Iron Foundry 275m north-west, on Bedford Street
1884 to 1899	No obvious changes	The Gravel Pit is no longer shown. Iron Foundry is, post 1884, no longer annotated but the buildings remain. Gravel Pit 450m north
1922 to 1932	The northern site boundary is now defined	No obvious changes
1946 to 1976	No obvious changes	The residential development of Hitchin reaches the current western limit during this period
1977 to 1991	No obvious changes	The residential property (Headlands) is now shown adjacent to the western site boundary. Lavender Barn is shown on the field north of the site. (The Hitchin area is known for the historical production of lavender). The Gravel Pit, 450m north, is no longer shown. The Iron Foundry building has been redeveloped
1992 to 2002	The densely vegetated area on the western side of the site is now marked	No obvious changes
2010 to 2014	No obvious changes	Lavender Barn has been replaced by the current Care Home
2014 to 2016	From field observations: The site has changed use (time frame not known) to a fallow field	From field observations: No obvious changes
2016 to 2024	No obvious changes	No obvious changes

ANECDOTAL INFORMATION

The Client has conveyed the following information and sketch of approximate locations from the previous site owner:

"The seller has disclosed that household rubbish and excess builder's materials and waste are buried in a backfilled pit in the south-east corner of the orchard. The pit is said to also contain old metal tanks, corrugated steel iron sheeting, together with general ferrous and cementitious building waste products. They also state that some asbestos cement roofing sheet waste may be buried in the pit"



The area was inspected during both site walkovers and the indicated positions of the pit, and the channel corresponded well with the noted topographical features in that area. The marked position of the tanks corresponded with that of two metal containers seen at surface. This size and shape of the pit is typical of *ad-hoc* extraction and filling seen on farmland. Surface-mounted storage tanks in such an area possibly represent fuel storage for farm vehicles, although there was no evidence to support this conjecture.

INDUSTRIAL USE SITES

There is one record of current industrial land use within 250m of the site: an electricity sub-station 93m north.

There is one recorded active fuel filling station identified within 500m: 446m south-east, on Upper Tilehouse Street. This station is obsolete but is also at an elevation some 10m below that of the site. (This record is discounted by reason of no likelihood of a pathway developing).

Historical and Current Site Use

The site was historically an open plot of agricultural land, which has remained relatively unchanged to the present day, it is therefore considered that contamination will likely be limited and at low concentrations.

ENVIRONMENTAL PERMITS, INCIDENTS AND REGISTERS

There is one record of a Part A(2) and Part B Activity within 500m: 456m south-east, a fuel-filling station. There are no records of enforcements, and this operation is known to be obsolete.

There are no other significant records

POTENTIALLY SENSITIVE LAND USES

The site lies within a Nitrate Vulnerable Zone. There are several records of other environmentally sensitive land use within 2km of the site: the nearest is a Site of Special Scientific Interest, 578m north, on Oughtonhead Lane.

WASTE TREATMENT AND LANDFILL SITES

Reference to records indicates that there are no records of either current, or historical, landfill sites within 1km. (Those recorded beyond this distance are discounted by reason of no likelihood of a pathway developing)

There are no BGS, Environment Agency or Local Authority records of waste transfer sites, waste treatment sites or waste management facilities within 500m.

WORKED OUT GROUND/MADE GROUND

Worked out ground is recorded 49m east and 163m northeast of the site. It appears that such features have been developed over or infilled over time as shown on the historical maps dated between 1931 and 1992.

RADON GAS

Reference to BR 211, 'Radon: guidance on protective measures for new dwellings' and the indicative UK Radon maps indicates that the site lies within an area where between 1% and 3% of homes exceed the action level of 200Bq/m³ for radon gas. As such, radon protection measures are not necessary in the construction of new dwellings or extensions without underground rooms on this site.

INITIAL CONTAMINATION CONCEPTUAL SITE MODEL

A qualitative Preliminary Risk Assessment (PRA) has been undertaken in line with the EA's online guidance, Land Contamination: Risk Management (LCRM).

It is understood that the development proposals are for residential houses with private gardens.

Potential sources of contamination and potential receptors have been assessed using the source-pathway-receptor principle to create a Conceptual Site Model (CSM). This takes into account the fact that a complete pathway must exist between a potential source of contamination and a potential receptor for there to be considered a risk.

POTENTIAL CONTAMINATION SOURCES

Potential Solid-, Liquid- and Vapour-phase Contamination Sources

The results of the desk study and walkover indicate that the following potential sources of soil or groundwater contamination are present at, or in close proximity to, the site:

- A backfilled pit of relatively small surface area is thought to be located within the vegetated area of the site. Anecdotal evidence suggests that the pit contains household rubbish, excess builder's materials, old metal tanks, corrugated steel iron sheeting, general ferrous and cementitious building waste products and, possibly, some asbestos-cement roofing sheet material
- Surface-mounted storage tanks within the vegetated area are a potential source of contamination - thought most likely to be agricultural diesel fuel

Potential Ground Gas Contamination Sources

Two main groups of gaseous-phase contamination have been considered: the gases (including methane and carbon-dioxide) that result from organic decomposition of constituents in the ground; and Radon gas that results from the radioactive decay of thorium and uranium (found, in varying quantities, in most soils and rocks).

In consideration of the source-pathway-receptor methodology for ground gas risk assessment set out in CIRIA C665, the sensitivity of the residential development is considered to be high.

The site is located in an area where the risks from ground gases are considered to be Moderate-Low. We have therefore provisionally assessed the risk of ground gas impacting the site, by reference to the CL:AIRE research bulletin RB17, "A pragmatic approach to ground gas risk assessment" 2012.

The following potential sources have been assessed:

- No credible sources or pathways for landfill gas migration from an off-site landfill have been identified.
- Migrating ground gases generated from decomposition of Made Ground used for the sports field construction some 140m northwest.
- The site has not been a registered landfill.
- Any Made Ground present is not expected to be 5m deep or an average of 3m in thickness.
- The site does not lie on a potential naturally organic soil.

- Radon protection measures are not required for this development without underground rooms

Therefore, the following potential ground gases have been identified for the site:

- Migrating carbon dioxide and methane gases
- Carbon dioxide and methane from a degrading hydrocarbon plume

RECEPTORS

The following most sensitive receptors have been identified at the site:

Human Health – Long Term Exposure

- End users of the site - the future residents
- Nearby residents

The critical receptor is a child under the age of six.

Human Health – Short Term Exposure

- Construction workers (during redevelopment)
- General Public (during redevelopment)

The critical receptor is an adult.

Controlled Waters and Environment

- Controlled Waters - the Glaciofluvial Deposits Secondary Aquifer beneath the site and Chalk Principal Aquifer some 30m to 60m beneath that
- Controlled Water - Drinking water extraction source to the west - the site is in SPZ 3

Infrastructure

- Substructures
- Water supply pipes

PATHWAYS

It is considered that a number of potential pathways exist between these potential sources and the above identified receptors. The viability of these pathways is discussed in the preliminary risk assessment.

Human Health

- Direct soil ingestion in areas of exposed soil
- Ingestion of soil attached to homegrown produce
- Ingestion of homegrown produce with contamination uptake
- Inhalation of indoor and outdoor vapours and dust
- Dermal contact with contaminated soil
- Inhalation of soil, gases or vapours migrating through permeable strata into the building
- Explosion of soil gases migrating through permeable strata into the building

Controlled Waters and Environment

- Migration/leaching of contaminants through the unsaturated zone
- Migration of contaminants through the groundwater

Infrastructure

- Leachable or corrosive contaminants within the soil
- Corrosive contaminants within the groundwater

PRELIMINARY RISK ASSESSMENT

Desk Study research has identified several potential contamination sources on the site including:

- A backfilled pit of relatively small surface area is thought to be located within the vegetated area of the site. Anecdotal evidence suggests that the pit contains household rubbish, excess builder's materials, old metal tanks, corrugated steel iron sheeting, general ferrous and cementitious building waste products and, possibly, some asbestos-cement roofing sheet material
- Surface-mounted storage tanks within the vegetated area are a potential source of contamination - thought most likely to be agricultural diesel fuel
- Migrating ground gases generated from decomposition of Made Ground used for the sports field construction to the north

Based upon the findings of the Conceptual Site Model (CSM), it is considered highly likely that soils and groundwater below the site area itself may be locally contaminated in the vegetated areas of the northwestern area of the site. It is believed that any contamination that may be encountered in the groundwater would most certainly have originated on site, there being no other historic activity in the immediate area of the site.

The potential identified contaminants pose a risk to human health via direct contact, ingestion or inhalation, and controlled waters (Secondary A Aquifer and Principal Aquifer) via migration/leaching of contaminants through the unsaturated zone and migration of contaminants through the groundwater

As the site lies within an SPZ, where sustainable drainage solutions (SuDS) are being considered, the Environment Agency's guidance Groundwater protection: Principles and practice (GP3) should be referred to and surface waters must not be directed through contaminated soils into the aquifer.

It is considered that gas monitoring is required at this site.

INITIAL GEOTECHNICAL GROUND MODEL

A geotechnical desk study to identify risks relating to mining etc is outside the scope of this investigation but the following comments are made relating to the general geotechnical risks identified on the site.

The anticipated geology on site is likely to comprise limited/shallow Made Ground associated with the farm operations and localised relatively small surface area backfilled pit, overlying a mixture of fine and coarse-grained soils of the Glaciofluvial Deposits which in turn overlies the West Melbury Marly Chalk.

The West Melbury Marly Chalk is thought to lie between 30m and 60m below the site

Shallow foundations are considered to be suitable founded within competent Glaciofluvial Deposits.

The Dunsmore Gravel Member is not typically sulphate bearing, however, the Charmouth Mudstone Member, part of the Lias Group is a sulphate bearing strata.

The presence of trees in the northwestern, southern and southeastern areas of the proposed development may pose a risk of causing seasonal desiccation should significant fine-grained soils with volume change potential be encountered within the influencing zone of the trees.

The Dunsmore Gravel Member is not typically sulphate bearing, however, the Charmouth Mudstone Member, part of the Lias Group is a sulphate bearing strata.

Although the site is underlain by the West Melbury Marly Chalk, this formation is known to be of relatively low calcium carbonate content and is thought to lie between 30m and 60m below the site. Furthermore, at this depth it is likely to be below the groundwater table and not of great thickness. As such, it is considered that there is a negligible risk from both, natural and mining, cavities affecting the development.

The presence of trees in the northwestern, southern and southeastern areas of the proposed development may pose a risk of causing seasonal desiccation should significant fine-grained soils with volume change potential be encountered within the influencing zone of the trees.

At this stage, therefore, the main potential geotechnical hazards for the site are considered to be,

- Potential solution features - very low risk
- Deepened foundations due to vegetation influence

The intrusive investigation has been implemented to address these main issues and establish any potential problems for foundations and the general development of the site.

EXPLORATION AND TESTING

As part of the Phase 2 intrusive investigations, a total of nineteen exploratory holes were formed at the site. The works comprised:

- Three cable-tool percussive boreholes (BH1 to BH3)
- Nine mechanically-excavated trial pits (TP1 to TP9)
- Three hand auger boreholes (HA1 to HA3)
- Four hand-excavated trial pits (HDP01 to HDP04) – 16.07.021c 31/01/2025
- In-situ testing (including Standard Penetration Tests and Soil Infiltration tests)
- Gas and groundwater monitoring well installations
- Two gas and groundwater monitoring visits
- Geotechnical laboratory testing
- Chemical laboratory testing

The exploratory holes were formed between the 8th August 2016 and the 9th August 2016. The monitoring visits were conducted on the 1st September 2016 and the 9th September 2016.

Four additional hand excavated trial pits (in addition to the two trial pits (TP8 and TP9) and three previously undertaken hand augers (HA1 to HA3) targeting the woodland area were carried out on the 31st January 2025.

The ground levels of the exploratory locations (except the hand excavated trial pits) were determined by tilt-level survey using a manhole cover on Lucas Lane as a datum. The level of the datum (+89.38m AOD) was obtained from Public Domain data. Approximate co-ordinates (except hand auger boreholes of the exploratory locations were extracted from Public Domain data.

The positions of all exploratory holes undertaken at the site as part of this investigation can be seen on the Exploratory Hole Location Plan in Appendix A. The logs, and field test and monitoring results are provided in Appendix B and the results of the laboratory testing are provided in Appendix C.

Engineering conclusions given in this report are based on data obtained from these sources, but it should be noted that variations, which affect these conclusions, may inevitably occur between and beyond the test locations. Water levels may also vary seasonally and with other factors.

SAMPLING STRATEGY

The investigation was undertaken in accordance with the scope of works agreed with our client. The positions of the exploratory holes were selected by ListersGeo to provide a wide coverage of information on the site area.

Access to the vegetated area was difficult due to the density of the vegetation and work in this area was restricted to using hand tools.

The desk study and walkover survey identified a localised potential on-site pollution source within the vegetated area, and this was targeted with the hand-auger boreholes (HA1 to HA3), hand excavated trial pits

(HDP01 and HDP03) and the two machine excavated trial pits, TP8 and TP9. The other exploratory holes were positioned to create a regular pattern across the site.

METHODOLOGY

Health and Safety

Prior to commencement of boring/testing/excavation, to minimise the dangers from/to buried services, the proposed locations were scanned using a Cable Avoidance Tool. At the borehole and probe locations, a service avoidance pit was dug, using insulated hand tools, to a depth of around 1.2m below ground level (bgl). No buried services were encountered in the locations of the exploratory holes.

Exploratory Holes

Hand auger boreholes HA1 to HA3, were put down using a Dutch portable hand auger to a maximum depth of 1.00m below existing ground level. The 55mm diameter auger head was rotated and pushed down into the soil by means of a T-handle to obtain selected disturbed soil samples at regular intervals.

The trial pits were excavated using a rubber-tyred 8-tonne mechanical backhoe excavator to depths of between 1.00m and 3.20m bgl (below ground level), under the supervision of a geotechnical engineer, who made a record of the exposure and arisings. Samples were taken for subsequent chemical and geotechnical laboratory testing. Infiltration testing was undertaken in trial pits TP2, TP3 and TP4, in general accord with BRE Digest 365 'Soakaway Design'. (It should be noted that these were the three pits that the plant available could safely access). On completion, the trial pits were backfilled with arisings and the excess was mounded at surface.

Shallow trial holes HDP01 to HDP04 were excavated using insulated hand tools to depths of between 0.80m and 1.00m below ground level. Disturbed samples were taken at selected depths down to the base of the holes for subsequent laboratory testing and inspection. On completion, all trial pits were carefully backfilled with arisings, ensuring that excavated material was replaced in the same order as it had been removed.

The cable percussion boreholes were formed using a standard cable percussion rig, at a diameter of 150mm, to a depth of 15.00m bgl. Metal casing was extended to depths of between 3.5m and 6.0m to support the bore. Disturbed samples were collected at regular intervals throughout for laboratory inspection and testing. Standard Penetration Tests (SPTs) and undisturbed tube samples (U100s) were alternated, as appropriate, at 1.0m intervals down to 10.00m depth and at 1.5m intervals thereafter.

Installations

On completion of the boring, borehole BH3 was backfilled with arisings and boreholes BH1 and BH3 were utilised for the installation of a 50mm diameter slotted uPVC standpipe from the 6.00m of the borehole up to within 1.00m below existing ground level. From 1.00m depth up to ground level a plain pipe was added. The slotted section of the standpipe was surrounded with pea gravel, while expansive bentonite clay was added around the plain pipe and below the slotted section to seal the borehole. The standpipe was finished with a

rubber bung and gas tap and protected with a stopcock cover, which was then concreted flush with ground level.

In-situ Testing

Infiltration testing was undertaken in trial pits in accord with BRE Digest 365 'Soakaway Design'.

Monitoring and Sampling

Ground gas monitoring was carried out in the monitoring wells using a calibrated Geotech GA 5000 gas analyser.

Groundwater levels were monitored using a standard Geotech dip meter.

GROUND CONDITIONS

The site and laboratory test work revealed that the general succession of strata can be summarised as: Topsoil overlying localised Made Ground; Glaciofluvial Deposits (with localised Glacial Channel Deposits) and Glacial Channel Deposits. The bedrock West Melbury Marly Chalk Formation was not encountered. Our Ground Model for the site is as follows; and is further illustrated by the Geological Cross-Section presented in Appendix E:

TOPSOIL

Topsoil was encountered from surface at each exploratory location to depths of between 0.10m and 0.30m bgl (averaging 0.25m) and comprising brown, slightly gravelly, slightly sandy, slightly organic silty clay.

MADE GROUND

Made Ground was encountered immediately beneath topsoil: at each of the three hand-auger boreholes, hand excavated trial pits, HDP02 to HDP04 and in trial pit TP8 - all within the vegetated area. Extending to between 0.30 and 0.50m depth in HDP02 to HDP04 and TP8, and to the full depth of HA1 to HA3, at depths of between 0.60m and 1.00m.

Made Ground soils generally comprises light brown and orange brown, sandy, slightly clayey, gravel. The gravel content recorded was subangular and subrounded of brick, flint, chalk, concrete and rare coal.

GLACIOFLUVIAL DEPOSITS

Glaciofluvial Deposits were encountered at each location (except for the hand-auger boreholes which did not fully penetrate the Made Ground) beneath Topsoil and (where present) Made Ground.

The depth to the base of these deposits varied between 6.75m and 12.00m bgl in the three deep boreholes: seeming to increase towards the east.

Comprising a wide variation of grain sizes but represented, in general, by: stiff, orange-brown, slightly gravelly, slightly sandy, silty clay, with gravel of flint; overlying orange-brown, clayey to very clayey, slightly gravelly, fine sand, with (throughout) occasional flint cobbles. Localised variations within the fine soils were: the proportions of coarse portions (sand and gravel); localised lignite debris, and black speckling. Localised variations within the coarse soils were a general coarsening towards the west, locally to a very sandy gravel, and the occasional presence of pockets of fine soils.

The fine soils, where fully penetrated, extended to depths of between 2.10m and 4.00m, increasing southwards across the site, and were absent from the two trial pits on the edge of the vegetated area (TP8 and TP9).

Fine-grained

Atterberg Limits tests classify the fine-grained Glaciofluvial Deposits as varying between a non-shrinkable soil and a shrinkable soil of low to medium volume-change potential - in the NHBC Building Standards, Chapter 4.2 scheme. Measured moisture contents ranged between 6.0% and 28%, with most of the variation being

due to the variable coarse fraction. There were signs of desiccation in the two pits on the edge of the vegetated area - TP8 and TP9.

The 'coarse soil' (>425µm) fraction of the fine soils varied between about 0% and 60% and the fines (silt/clay) fraction varied between about 20% and 90%.

In-situ hand shear vane tests revealed undrained shear strengths of between 84kPa and 120kPa, but the soils were often too stiff or too gravelly for the test, so that range is skewed towards the lower range of strengths. Borehole SPT N-values of between 20 and 23 were recorded, and these can be approximated to undrained shear strengths of between 120kPa and 138kPa.

Coarse-grained

Particle size distribution tests of the coarse soils revealed the gravel content (in general) to vary between about 1% and 15%; the sand content to vary between about 45% and 80% and the fines content to vary between about 15% and 45%. Exceptions to this were from exploratory holes located towards the western side of the site, where the gravel content varied between about 50% and 60%; the sand content varied between about 20% and 40% and the fines content varied between about 15% and 30%.

Borehole SPT N-values of between 8 and 50 were recorded, generally increasing with depth and these correspond to a loose to very dense, but characteristically medium dense to dense, state.

GLACIAL CHANNEL DEPOSITS

Glacial Channel Deposits were encountered beneath the Glaciofluvial Deposits in the three deep boreholes at depths of between 6.75m and 12.00m, increasing, across the site, towards the east, and seen to the base of these holes: a maximum depth of 15.00m bgl.

Represented by very stiff, grey-brown, sandy, silty clay.

Borehole SPT N-values of between 34 and 50 were recorded, with a general increase with depth, and these can be approximated to undrained shear strengths of between 153kPa and 225kPa.

CALIFORNIA BEARING RATIO (CBR) TESTS

Laboratory CBR tests were undertaken on four samples of fine Glaciofluvial Deposits - the anticipated pavement formation. The test specimens were remoulded at natural moisture content using a 2.5kg compactive effort. Results of the testing ranged between 6.8% and 34%.

GROUNDWATER

Groundwater was not encountered within any of the exploratory holes of this investigation and the standpipes were dry at the times of monitoring visits.

OBSERVED SOIL CONTAMINATION

No visual or olfactory signs of contamination were noted during the fieldwork, other than the metallic and glass artefacts within the Made Ground from TP8 on the edge of the former farmer's pit in the densely vegetated area. Whilst these artefacts are not necessarily contaminative in themselves, they do confirm the anecdotal evidence for the presence of the pit.

CALIFORNIA BEARING RATIO (CBR)

The results of laboratory CBR tests, undertaken on four bulk disturbed soil samples of fine grained Glaciofluvial Deposits soils, remoulded at natural water content using a 2.5kg compactive effort. Results of the testing ranged between 6.8% and 34%.

SOIL DESICCATION

There was visual evidence of soil desiccation at surface across the site (dry and friable topsoil) but below this surficial layer obvious evidence of desiccation was restricted to TP5 (south-western corner of the site) and all of the exploratory holes close to the densely vegetated area. The field observations were confirmed by the laboratory testing, with desiccation in TP5 to a depth of around 1.75m and to the full depth of the exploratory holes near to the densely vegetated area - a maximum of 1.00m bgl.

INFILTRATION TESTING

To assess the infiltration capacity of the soils, infiltration testing was carried out at the site in accord with BRE Digest 365, Soakaway Design.

Infiltration testing was undertaken in three trial pits, TP2, TP3 and TP4 at depths of between 2.00m and 2.20m (all within the fine Glaciofluvial Deposits), following the principles of BRE Digest 365 'Soakaway Design'.

The time on site and the rate of infiltration allowed for only a single stage of tests in each pit and the results could only be calculated by extrapolation of the test data. The reported results should, therefore, be viewed accordingly. The tests produced infiltration rates of between 1.0×10^{-6} m/s and 8.5×10^{-7} m/s, respectively. These results are indicative of poor soakage potential

GROUND GAS MONITORING

Ground gas monitoring (carried out as a part of this investigation) has revealed oxygen levels of between 18.9%v/v and 20.5%v/v, carbon dioxide levels of between 0.9%v/v (BH 1) and 3.2%v/v (BH 2), and methane levels of <0.1%v/v. Flow rates ranged between 0.4l/hr and 0.6l/hr.

CONCRETE AGGRESSION TEST RESULTS

Soluble sulphate tests carried out on soil samples recovered from the exploratory holes recorded values ranging from 0.06g/l to 0.21g/l, in conjunction with pH values ranging from 7.2 to 7.8 pH units.

GROUND CONTAMINATION ASSESSMENT

The contamination risk assessment has been undertaken in line with the EA's online guidance Land Contamination: Risk Management (LCRM) in order to validate the Preliminary Risk Assessment (PRA) using Generic Quantitative Risk Assessment (GQRA), followed by Detailed Quantitative Risk Assessment (DQRA) if required.

SOIL TESTING

Three samples of Topsoil, ten samples of Made Ground and one sample of the natural soil deposited Glaciofluvial Deposits, collected on site during this and the previous investigation were tested for a range of constituents of potential concern (CoPC). Samples from TP01, TP03, TP05 and TP07 were selected to provide a coverage of information across the site; with samples from HDP01 to HDP04 and HA01, HA02, HA03 and TP08 being undertaken to target the woodland area and identified potential contamination sources in this area.

The suite of testing carried out on the samples was decided upon following consultation of R&D CLR Publications, published as part of the Contaminated Land Exposure Assessment (CLEA), a joint venture between the Department for Environment, Food and Rural Affairs (DEFRA) and the Environment Agency.

The test suite included:

Group	Details
Asbestos	Screening for ACMs and fibres with the naked eye and microscopy
Inorganic substances	Arsenic, cadmium, chromium, copper, lead, mercury, nickel, selenium, zinc Sulphates
Organic substances	16 (EPA) speciated polycyclic aromatic hydrocarbons (PAH) Total petroleum hydrocarbons (TPH) with four and eight band split
Other	pH Total organic carbon (TOC)

Unless explicitly stated on the laboratory report, the soil samples were tested to obtain 'Total' values within the soil. The results of the chemical tests from this investigation are included in Appendix C.

In addition, two combined samples of Made Ground from HA2 and HA3, and HA1 and TP8 were screened in line with the Waste Acceptance Criteria (WAC). The total soil results from this testing, which include PAHs, petroleum hydrocarbons, BTEX and polychlorinated biphenyls (PCBs), have also been considered in the ground contamination assessment. The results of the WAC testing are included in Appendix F.

RISK ASSESSMENT GUIDELINES – HUMAN HEALTH

The human health risk assessment has been undertaken using the guidance provided in the EA's LCRM guidance and the CLEA guidelines.

This assesses risks associated with the ingestion, dermal contact, and vapour inhalation pathways related to contaminated soils and groundwater. Risks associated with the inhalation of Ground Gas, for example that resulting from landfill, is not addressed by LCRM. The assessment for ground gases has been undertaken separately in the Ground Gas Risk Assessment section of this report.

Human health assessment criteria used are based upon the proposed final land use of the site. As the site is to be redeveloped to accommodate a residential development with gardens, the Generic Assessment Criteria (GACs) for the standard land-use, 'Residential with homegrown produce' have been used.

Category 4 Screening Levels (C4SLs)

Published in March 2014 by DEFRA, a limited number of generic Category 4 Screening Levels (C4SLs) were produced to support the revised Statutory Guidance to support Part 2A of the Environmental Protection Act 1990, which was published in April 2012. This Guidance 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.

Further C4SLs have been and are being produced by CL:AIRE, with support from SoBRA and SAGTA, for a limited number of volatile organic compounds, as time allows.

Suitable 4 Use Levels (S4ULs)

To supplement the small number of C4SL, a set of Suitable for Use Levels (S4UL) were produced, in 2015, by Land Quality Management (LQM) and the Chartered Institute of Environmental Health (CIEH), using the EA's Contaminated Land Exposure Assessment (CLEA) software, version 1.06 (2009), and the revised assumptions used in deriving the C4SL. The S4UL are more conservative than the C4SL and are derived to represent the minimal levels of risk to human health as described in the EA's SR2 guidance, with the intention of being 'suitable for use' under planning.

Data Sources

Where chemical specific data has been used in the above assessments, data has been sourced from available TOX reports, published by DEFRA, The Total Petroleum Hydrocarbon Criteria Working Group (TPHCWG) literature and toxicological and physical data obtained from EA Publication, 'Human Health Toxicological Assessment of Contaminants in Soil', August 2008.

RISK ASSESSMENT GUIDELINES – CONTROLLED WATERS

The procedures set out in EA's RTM *Hydrogeological risk assessment for contaminated land* (2006), have been followed.

RESULTS OF ASBESTOS SCREENING

Screening for the presence of asbestos did not reveal any asbestos containing material (ACM) or fibres in the soils tested; to an assayed level of 0.001%v/v.

RESULTS OF TOTAL SOIL TESTS

Results of the total soil testing have been compared to relevant published GAC as discussed above. For S4ULs, a range of values have been published for the organic contaminants based on the soil's organic matter content.

The soil testing indicates that the soils have a total organic carbon (TOC) content of between 1.3% and 3.7%, which is approximately 2% and 6% soil organic matter (SOM). The more conservative value is used and therefore the S4ULs for 1% SOM have been referred to for the organic contaminants.

Of the remaining determinands tested for, a number recorded values higher than their relevant GAC for human health for a residential with homegrown produce setting. These contaminants are discussed further below.

The GACs are conservative screening criteria and used initially to determine whether or not a site may pose an unacceptable risk to human health and whether further work or assessment may be required. An exceedance of a GAC does not mean that remediation is required.

Inorganic Substances

Determinant concentrations of arsenic in eight of the samples of Made Ground and lead in four of the ten samples of Made Ground were above the GAC selected for human health in a residential setting with private gardens. These were in Made Ground soils within the northwestern area of the site where the densely vegetated area and woodland is currently located (HDP03, HDP04, HA01, HA02, HA03 and TP08).

No inorganic determinant concentrations in the area of the proposed private/residential gardens were above their relevant GAC.

The recorded levels of arsenic in the six samples of Made Ground were between 42mg/kg and 71mg/kg and the GAC for gardens is 37mg/kg. The GAC for arsenic in soils in areas of public open space in a residential setting is 79mg/kg, and none of the recorded levels exceeded this.

The recorded levels of lead in the six samples of Made Ground were between 110mg/kg and 510mg/kg and the GAC for gardens is 200mg/kg. The GAC for lead in soils in areas of public open space in a residential setting is 630mg/kg, and none of the recorded levels exceeded this.

Petroleum Hydrocarbons

Of the fourteen samples tested, six samples recorded a total TPH concentration above the limit of detection of 10mg/kg. However, these value was relatively minor (Highest of 82mg/kg) and the individual bands were significantly below the referenced GACs and therefore not considered further.

Polycyclic Aromatic Hydrocarbons (PAH)

Of the fourteen samples tested, one sample of the polycyclic aromatic hydrocarbon (PAH) compounds recorded an exceedance for referenced GAC (residential with homegrown produce end use). This was Dibenz(a,h)Anthracene in a sample of Topsoil in TP3 at 0.10m depth, the recorded level was 0.40mg/kg and the GAC for gardens is 0.24mg/kg.

The test results indicate that the elevated dibenz(a,h)anthracene recorded in TP3 is present in small quantities and marginally exceeding the relevant screening values. The elevated PAHs maybe associated with either small quantities of asphaltic material or coal ash encountered within the Made Ground which are normally considered to be of relatively low mobility. No Visual or olfactory evidence of hydrocarbons was noted. It is considered likely that the limited occurrences and marginal exceedance of dibenz(a,h)anthracene recorded do not pose a significant risk to the end users and no further action is considered necessary with respect to dibenz(a,h)anthracene in TP3.

HUMAN HEALTH RISK ASSESSMENT

The following quantitative risk assessment has been carried out using the source-pathway-receptor principle. Potential sources of contamination identified in the Conceptual Site Model (CSM) have been assessed using the CLEA Guidelines. This takes into account the fact that a complete pathway must exist between a potential source of contamination and a potential receptor for there to be considered a risk.

The potential human receptors evaluated for their individual risk are:

Long-Term Exposure

- End users of the site – the future residents.
- Nearby residents.

Short-Term Exposure

- Construction workers and the general public (during redevelopment).
- Maintenance workers

If the proposed site use or layout should alter significantly, then the human health risk assessment will require re-evaluation.

SOIL CONTAMINATION RISK

The qualitative preliminary risk assessment (PRA) identified a number of potential sources of contamination at the site. Following the intrusive investigation and contamination testing the CSM has thus been reassessed.

The results of the chemical testing are summarised below relating to each potential source:

Potential Source	Chemical Testing Comments
Backfilled Pit	Elevated concentrations of Arsenic and Lead which were lower than the referenced GAC for of public open space in a residential setting.
Surface-mounted storage tanks	Low concentrations of TPH, however the individual bands were significantly lower than the referenced GAC

None of the soil contamination tests carried out as part of this investigation revealed elevated concentrations of contaminants in the soil when compared with the relevant GACs (residential with homegrown produce in areas of proposed gardens and public open space in areas of woodland). As such there is considered to be no significant risk of significant harm to the above referenced long term exposure receptors. In addition, the presence of trees and rootballs will further limit contact of the proposed residents with the soil as it will limit excavation in this area.

It is therefore considered that there are no significant risks to human health from the soil or groundwater contamination at the site. There is, therefore, no requirement for investigation or remedial measures prior to the proposed redevelopment.

Asbestos

Although no asbestos was identified in the soils at the site, the presence of asbestos containing material (ACM) and fibres within Made Ground at any site cannot be ruled out. Groundworkers should be made aware of potential risks of asbestos during the groundworks.

Asbestos in soils is not normally hazardous to humans unless it is disturbed and fibres become airborne and can be inhaled. Asbestos is most frequently encountered bonded in cement in fragments of corrugated roofing sheets, in tiles or in insulation materials. Any groundworks involving asbestos needs to be appropriately controlled.

It is considered that there are no significant risks to human health from the soil or groundwater contamination at the site. There is, therefore, no requirement for investigation or remedial measures prior to the proposed redevelopment.

END USERS OF THE SITE

The soil contamination testing, and the field observations to-date indicate that there no widespread contamination at the site but that total concentrations of arsenic and lead in the Made Ground soils within the densely vegetated area at the western end of the site may present a significant risk of significant harm to end-users, but only if within a private garden area of the planned development. However, as this is not proposed to be the case, and as the levels in this area, are suitable for use within areas of public open space, remediation is not considered necessary based on the current development proposals.

CONSTRUCTION WORKERS

The exposure route of primary concern for the contamination is 'direct soil ingestion'. For the construction workers there is a direct link to the soil when they undertake the site work and therefore different measures should be taken to manage the short-term exposure risk of coming into contact with contaminated soil.

To reduce the risk to as low as reasonably practicable for the construction workers it is recommended that appropriate health and safety measures be implemented along with the use of Personal Protective Equipment. All personnel coming into contact with the soil, ground-workers in particular, should be instructed to use gloves when on site to avoid dermal contact and restrict inadvertent hand-to-mouth ingestion. Washing facilities should be provided for the site staff to use, and should be used prior to eating or smoking. For further guidance, reference could be made to the HSE Document, "Health and safety in construction".

Development activities have the potential to create short-term pollutant linkages to the general public. These risks should be managed by means of the Construction Phase (Health & Safety) Plan.

Although no asbestos was identified in the soils at the site, the presence of ACM and fibres within Made Ground at any site cannot be ruled out and there is possible evidence of ACM within the buried pit in the densely vegetated area. Ground workers should be made aware of potential risks of asbestos during the groundworks prior to beginning work.

REGULATORY APPROVAL

We recommend that the conclusions of this report are agreed with the relevant Local Authority at the earliest stage, to reduce potential delays to the development.

GROUND GAS RISK ASSESSMENT

The preliminary ground gas risk assessment indicated that gas monitoring was required.

The results of the gas monitoring have revealed that low levels of carbon dioxide gas up to 3.2% are being produced in the ground and methane gas being produced in the ground are less than the detection limits of 0.1%. Flow rates between 0.4l/hr and 0.6l/hr were recorded.

The low flow rates show that no significant volumes of gas are being produced in the ground. There was no significant thickness of Made Ground and no organic rich soil beneath the site.

GROUND GAS SCREENING VALUES

Using the carbon dioxide and methane readings together with the absolute flow rates, the following maximum gas screening values have been calculated for each borehole:

Borehole	Carbon Dioxide Gas Screening Value (l/hr)	Methane Gas Screening Value (l/hr)
BH1	0.016	>0.001
BH2	0.015	>0.001

Using the maximum carbon dioxide reading of 3.2% with the highest recorded absolute flow rate of ± 0.6 l/hr, the maximum gas screening value is 0.019l/hr.

There were no carbon dioxide levels above 5% and no methane levels above 1%.

This classifies the site as Characteristic Situation CS1.

It is therefore considered that ground gas protection measures are not required for this development.

Radon Gas

The BGS advises that radon gas protection measures are not necessary for buildings without underground rooms at the site.

REGULATORY APPROVAL

The above conclusions regarding ground gases should be agreed with the relevant local Regulatory Authority as soon as possible prior to development.

CONTROLLED WATERS RISK ASSESSMENT

The following Controlled Waters risk assessment has been carried out in accordance with the procedures set out in the EA's RTM *Hydrogeological risk assessment for contaminated land* (2006). Using the source-pathway-receptor principle, this takes into account the fact that a complete pathway must exist between a potential source of contamination and a potential receptor for there to be considered a risk.

The potential Controlled Waters receptor considered during this risk assessment was:

- Controlled Waters - Aquifers beneath the site. The coarse soil horizons of the Glaciofluvial Deposits (Secondary Aquifer) and the deep-lying Wet Melbury Marly Chalk (Principal Aquifer)
- Controlled Waters - Drinking water source extraction to the west. The site is in SPZ3

DISCUSSION

Relatively low levels of contaminants were measured in the solid tests and the WAC suites of tests on samples of Made Ground indicate a very low potential for leaching of contaminants - including arsenic and lead. Furthermore, groundwater was not encountered during the fieldworks down to a maximum depth of 15.00m bgl. On the basis of the works performed, therefore, we consider that there is no significant risk to controlled waters.

REGULATORY APPROVAL

The EA is the regulatory body charged with protection of controlled waters and may be a consultee in the planning process. We recommend that the conclusions of this report are agreed with the relevant Local Authority at the earliest stage, to reduce potential delays to the development.

INFRASTRUCTURE RISK ASSESSMENT

SUBSURFACE CONCRETE

Using the results of the concrete aggression tests, the concrete design mix recommendations for subsurface concrete have been assessed in terms of BRE Special Digest 1.

Based upon the site history, the site may be considered as 'natural ground'.

The groundwater beneath the site may be considered as static for shallow foundations.

The classification is as follows:

Type of Site	Groundwater	Characteristic Sulphate			Characteristic	
		Soil Soluble (mg/l)	Ground-water (mg/l)	Total Potential (%)	Design Sulphate Class	pH (pH units)
Natural Land	Static	29	n/a	n/a	DS-1	7.2

The above assessment provides an Aggressive Chemical Environment for Concrete (ACEC) class of **AC-1**

UNDERGROUND SERVICES

Low levels of heavy metals and hydrocarbons were recorded in the made ground at the site. Generally, plastic pipes will not be affected by inorganic contaminants, but they could be affected by organic contaminants and extremes of pH in the soils.

Organic contaminants, such as petroleum or polycyclic aromatic hydrocarbons, may attack plastic pipes and remedial measures may be required. The pathway with the contaminated soils could be removed by sleeving the pipe with another material or by removing the contamination source itself.

It should be noted that the utility companies often have their own local guidelines and standards on levels of shallow soil contamination in the ground that may or may not be acceptable for the installation of below ground services. These standards may be different to those specified for assessing risks to human health and groundwater.

The local requirements should be obtained from the particular service supply company as soon as possible to avoid unexpected delays or additional development costs.

GEOTECHNICAL ENGINEERING CONCLUSIONS

The proposed development is understood to include private residential housing with gardens, an access road and driveways. No details of likely structural loads have been provided but are assumed to be typical of two- to two-and-a-half-storey housing. Furthermore it is understood that the northwestern area of site will be utilised as a communal open space (woodland).

If site conditions should be altered significantly, such as changes to existing levels, then this report may require re-evaluation.

REVISED GROUND MODEL

The exploratory work from this investigation has proven the expected general strata sequence of localised Made Ground; Glaciofluvial Deposits, Glacial Channel Deposits. The bedrock West Melbury Marly Chalk Formation was not encountered by this investigation, which extended to a maximum depth of 15.00m bgl and is thought to lie between 30m and 60m bgl. The Made Ground was restricted to the densely vegetated area, anecdotally thought to contain a buried pit. The Glaciofluvial Deposits were an admix of fine and coarse soils: generally fine near to surface becoming coarse but also becoming coarser towards the western end of the site. The fine Glaciofluvial Deposits were, characteristically, stiff, shrinkable soil of medium volume-change potential. The coarse Glaciofluvial Deposits were typically medium dense to dense, clayey, slightly gravelly sand, becoming sandy gravel in the west. The depth to the top of the Glacial Channel Deposits increased eastwards across the site, from 6.75m to 12.00m bgl. The Glacial Channel Deposits were, characteristically, very stiff, sandy silty clay. Groundwater was not encountered, neither to the full depth of investigation, at 15.00m bgl, nor during the monitoring of 6.0m deep standpipes on two occasions over three weeks.

The use of spread foundations will depend on the imposed loadings and tree influence, but it seems likely that a spread foundation solution may be possible. However, piled foundations are likely to be required if a significant thickness of shrinkable soil is present close to the densely vegetated area of the site and so may be preferred for the entire development.

It is recommended, in regard to foundation design, that additional ground investigation be undertaken in the densely vegetated area once the vegetation in that area has been cleared enough to allow access.

OTHER GEOTECHNICAL CONSIDERATIONS

Desiccation

Desiccation was seen in the south-western corner of the site: to around 1.75m bgl, and within the densely vegetated area - as would be expected. The other exploratory holes were located at least 5m from trees and showed no evidence of significant desiccation.

Risk of Natural Cavities and Mining Cavities

Although the site is underlain by the West Melbury Marly Chalk, this formation is known to be of relatively low calcium carbonate content and is thought to lie between 30m and 60m below the site. Furthermore, at this

depth it is likely to be below the groundwater table and not of great thickness. As such, it is considered that there is a negligible risk from both, natural and mining, cavities affecting the development.

SITE EXCAVATION

Conventional hydraulic plant should be satisfactory for excavating the soils to be removed and subsequent foundation and service trenches. However, instability should be anticipated in association with deep Made Ground - if encountered. In line with HSE guidelines, all excavations requiring personnel access should be adequately supported to avoid the risk of collapse. Excavations are likely to remain stable in the short term, in the absence of significant quantities of water. Groundwater is not anticipated but any inflows that do occur should be readily dealt-with using conventional pumping from sumps.

It should be appreciated however that seasonal variations may exist and hence groundwater entries may occur particularly during wetter months or after periods of inclement weather. It would be prudent, therefore, to continue the monitoring of groundwater levels up to construction.

Consideration should be given to the effects of trees and shrubs on service runs that cross the site. Soil movements brought on by the influence of vegetation can severely disrupt the drain runs and mains services, and measures should be incorporated into the excavations to allow for future ground movements.

Should any trees be removed from site (such as within the densely vegetated area), care should be taken to ensure the root ball of each tree is completely removed from the ground. Given time, any remnant root fragments may weather down to produce localised areas of soft organic soils.

Where new foundations are placed over a felled tree, consideration should be given to spanning these features to ensure no soft spots result in localised settlement.

FOUNDATION SOLUTIONS

Shallow Foundations

The Glaciofluvial Deposits is considered to be a suitable bearing stratum for conventional shallow foundations at a minimum depth of 1.00m below the proposed FFL, or 0.20m into the top of the formation, whichever is the deeper.

For foundations at these depths, a safe bearing pressure of 140kPa may be adopted for strip footing not exceeding 1.00m width and square pads not exceeding 3.0m in width, for settlements of 25mm, or less. This pressure calculation includes a factor-of-safety of 3.0 against general shear failure and is a conservative estimate on account of the possibility of encountering variable conditions (fine and coarse soils) across and between foundations. Consideration should be given to reinforcing strip foundations that do span obviously different soils.

Where foundations are to be constructed within the vicinity of trees or shrubs on this site then they may require deepening below any active roots and in accord with guidelines given in NHBC Building Standards Chapter 4.2. In this regard, the soils should be considered as being of medium volume change potential. For trees

that are not to be removed, mature heights should be assumed when determining the foundation depths. A proprietary compressible layer such as Claymaster or Clayshield should be placed along the sides of foundation excavations in order to accommodate heave forces in the ground where any trees and shrubs are removed in the vicinity of the proposed foundations or if the existing vegetation should die. Care should be taken to ensure that any new planting in the development will not affect the new foundations.

Pile Foundations

The required foundation depth due to vegetation influence for some parts of the site (especially where close to the densely vegetated area) may mean that piled foundations are either necessary or cost effective.

A preliminary pile design data sheet of ultimate values is included in Appendix E. The ultimate shaft friction and the end bearing has been calculated using the result of the standard penetration tests in conjunction with recognised conversion factors and laboratory test data, which has been used to derive our combined SPT N-value/undrained shear strength against depth plot, also presented in Appendix E. We recommend that any support from the Made Ground (seen only within the densely vegetated area of the site) is ignored.

Where piles are located within influence of trees/hedgerows at the site, then piles should be sleeved within the zone of desiccation to reduce the effects of any localised heave recovery of the soil should the trees be removed or die. This sleeving will also act to minimise the effects of seasonal uplift forces within the root zone.

A specialist piling contractor should be consulted as to the efficiency and suitability of piles installed using their particular systems in these ground conditions; their environmental impact with regard to the proximity of residential developments, and, ultimately, to provide the final design.

GROUND FLOOR SLABS

Provided all the Topsoil and Made Ground is stripped off, ground-bearing floor slabs could be constructed, in combination with a spread foundations solution, on a layer of well-compacted coarse-grained fill. However, for piled foundations, or for spread foundations where it is required to deepen the main foundations below 1.50m depth, due to the presence of vegetation or where seasonal desiccation is occurring, then ground floor slabs should be suspended in accord with NHBC guidelines. A void should be left below the floor slab to accommodate future moisture content related soil movements. This may be achieved by use of a proprietary compressible material such as Clay board or Cellcore.

ACCESS ROADS AND PARKING

Following re-grading, the areas of proposed pavement and hardstanding should be proof-rolled and inspected by a suitably qualified person. Any unsuitable zones, such as soft or highly compressible soils, should be removed and replaced with suitable backfill, compacted in layers using appropriate plant.

It is noted that some areas have a dense cover of mature vegetation (densely vegetated area at the north-western corner) or are peripheral to mature vegetation. Although locally desiccated clay soils were identified during our exploratory work only within the densely vegetated area, the presence of trees will mean that there is potential for ongoing desiccation issues which may affect the pavement surfacing within influencing distance.

Thus, safeguarding against desiccation in this regard could be considered, such as lime/cement stabilisation to appropriate depth, which can limit shrinkage/swelling desiccation effects by altering the properties of the clay. Alternatively, it could be accepted that some movements may occur, and which could be accommodated through flexible surface finishes.

The structural design of a road or hardstanding is based on the strength of the subgrade, which is assessed on the California Bearing Ratio (CBR) scale. It is anticipated that the stratum at formation level will be the fine-grained Glaciofluvial Deposits. Laboratory testing of samples of remoulded Glaciofluvial Deposits gave CBR values of between 6.8% and 34%. With reference to Transport and Road Research Laboratory, Report LR1132, and laboratory classification tests, it is recommended that, for formation prepared in the fine-grained Glaciofluvial Deposits, a subgrade CBR value of 4.7% is adopted for preliminary design purposes: based on equilibrium soil conditions, a thin pavement construction, low water table and average construction conditions. For formation prepared in the Made Ground a subgrade CBR of 1% is recommended.

The site conditions should be reassessed at the time of construction and the CBR/pavement design updated accordingly if considered necessary.

INFILTRATION MEASURES

Appropriately designed sustainable drainage systems (SuDS) are more sustainable than using piped drainage to local sewer systems. However, infiltration measures close to buildings may result in undermining of foundations and softening of soils leading to instability and should be located at suitable distances from foundations and infrastructure.

Test Results

Infiltration rates of 1.0×10^{-6} m/s and 8.5×10^{-7} m/s were obtained from trial pit tests in the fine-grained Glaciofluvial Deposits, indicating soils with poor soakage potential.

If soakaways are to be considered, then it is possible that deep borehole soakaways emptying into the coarse-grained Glaciofluvial Deposits may serve. If this is the case then it is recommended that testing be undertaken within the existing borehole standpipes to better inform design, as the base of both standpipes is within these deposits.

DISPOSAL OF ARISING

Site excavations, such as for foundations and services trenches are likely to produce arisings, some of which may be able to be re-used on-site and some of which will be surplus to requirements. The options for disposal of these arisings are discussed below:

RE-USE OF MATERIAL ON SITE

Currently, if surplus arisings are 'fit for re-use' on the site and have not been treated, their re-use is allowed within the planning law. If the arisings need treating prior to re-use, exemptions can be sought from the EA to allow this activity.

A recent voluntary code of practice published by CL:AIRE, in conjunction with the EA, (the Definition of Waste: Development Industry Code of Practice, Version 2) endorses the re-use of arisings on and off the site of origin without the need for exemptions from the EA, dependent on whether it is “fit for purpose”. It also supports the use of “Hub and Cluster” sites (to enable surplus soil to be used on agreed sites in the local vicinity, dependent on the soil being ‘fit for purpose’).

The use of a Materials Management Plan (MMP) during the earthworks phase will help to avoid paying tax on soil movements that might otherwise attract tax, if they are construed by the HMRC as being waste without the relevant documentation to prove otherwise.

Based upon the human health and groundwater risk assessments, the natural soils on this site are considered to be suitable to be re-used on site for landscaping purposes, dependent on the agreement of the Local Authority. The Made Ground soils, however, are not considered suitable for re-use with domestic garden areas without remedial precaution, although they may be suitable for landscaping.

WASTE CLASSIFICATION

Under current waste management legislation, arisings that are surplus to requirements will be classified as waste and need disposing off-site. Records must be kept of where the waste is taken upon leaving site and its final destination.

The classification is a twofold process using the soil chemical testing results and the European Waste Catalogue for off-site disposal, followed by testing under the Waste Acceptance Criteria (WAC) of the Landfill Directive specifically for landfill disposal.

EUROPEAN WASTE CATALOGUE DETERMINATION

Any soil classified as waste requires classification of the chemical constituents prior to leaving site in accordance with the European Waste Catalogue. Soils containing asbestos fragments or fibres will be classified as a mixed waste unless the asbestos can be separated.

Soils

The ‘Total’ soil contamination test results from the previous investigation, excluding asbestos, have been used in conjunction with the HazWasteOnline spreadsheets and the Technical Guidance WM3 published by the EA.

Three samples of Topsoil, six samples of Made Ground and one sample of Glaciofluvial Deposits were included in the assessment.

All of the soil has been classified as **Non-hazardous** waste.

With regard to European Decision 1999/31/EC, EWC 17 05 04 ‘Stone and soils from uncontaminated sites’ should be classified as **Inert**. The natural soils from this site should, therefore, be classified as such.

Further assessment of the Made Ground may be necessary within the vegetated area in the northwestern area of site, if any such soil is to be excavated, once access to that area is possible.

The assessment report is provided in Appendix F. This assessment does not take into account the presence of asbestos.

Asbestos

No obvious visual evidence of asbestos containing material (ACM) was noted in the soils during the fieldwork.

No ACM or asbestos fibres were identified at the chemical testing laboratory.

Technical Guidance WM3 states that 'if the waste contains fibres that are free and dispersed then the waste will be hazardous if the waste as a whole contains 0.1% w/w or more asbestos'. It also states that 'where the waste contains identifiable pieces of asbestos (i.e. any particle of a size that can be identified as potentially being asbestos by a competent person if examined by the naked eye), then the waste is hazardous if the concentration of asbestos in the pieces alone is 0.1% or more'.

Asbestos cement roofing sheet typically contains 10-15% asbestos, which is above the hazardous waste limit of 0.1%.

The asbestos gravimetric concentrations recorded at the site, therefore, do not classify the soil as hazardous waste.

In soils where asbestos pieces visible by the naked eye are encountered, this soil is considered as mixed waste and must be separated whenever possible and each separate waste stream classified accordingly. Any works involving or potentially involving asbestos must be undertaken by suitably trained groundworkers.

WASTE ACCEPTANCE CRITERIA (WAC) TESTING RESULTS

If it is decided that the surplus arisings will be disposed of at a landfill facility, the implementation of the Landfill Directive means that the waste soil requires testing under the Waste Acceptance Criteria (WAC) to determine whether it should be destined for an Inert, Non-hazardous, Stable non-reactive hazardous, or Hazardous landfill, or whether an alternative disposal method must be sought.

WAC testing has been carried out on two combined samples of the Made Ground collected from Ground from HA2 and HA3, and HA1 and TP8 0.20m to 1.00m depth in HA2 and HA3, and HA1 and TP8 from the western area of the site. The laboratory testing results are presented in Appendix F.

Sample WAC1 (HA2/HA3) was initially classified as Non-hazardous waste and the WAC testing indicates that the soil passes the Inert criteria

Sample WAC2 (TP8/HA1) was initially classified as Hazardous waste. The results of the WAC testing indicates that the soil passes the Inert criteria.

OVERALL WASTE CLASSIFICATION

From the results of the HazWasteOnline spreadsheets and the WAC testing, currently, the waste soil on this site is classified as follows:

Waste Stream	EWC Classification	WAC for Landfill Disposal	Comments
Made Ground – Light brown and orange brown slightly clayey sandy GRAVEL. Gravel is subangular and subrounded of flint, brick, concrete and chalk.	Non-hazardous	Inert	ACM must be removed or the soil will be Hazardous
Glaciofluvial Deposits – Orange brown slightly gravelly slightly sandy and sandy silty CLAY with occasional cobbles of flint. Gravel is angular and subangular of flint.	Non-hazardous	Not tested	Organic soils

Different categories of waste soils must not be mixed. The action of mixing hazardous waste with non-hazardous waste to dilute hazardous concentrations or to dispose of one waste type as/with another is illegal.

Pieces of ACM should be segregated and disposed of as Hazardous waste unless gravimetric testing indicates that the concentrations of asbestos fibres in the pieces is less than 0.1%.

Analytical results relevant to the materials being disposed of should be provided to the waste management contractors and landfill operators to confirm whether it meets their license agreements and to confirm tipping costs.

With regard to European Decision 1999/31/EC, EWC 17 05 04 'Stone and soils from uncontaminated sites, excluding topsoil and peat' should be classified as inert. Furthermore, in accordance with the Landfill Directive, uncontaminated soil and stones, including naturally occurring sands and clays, may be classified as inert without testing, provided that it is not topsoil or peat and excludes soil from contaminated sites. Inert waste should not undergo change, will not burn, react, biodegrade or adversely affect human health or the environment. It should not contain metals, plastics or asbestos.

Alternatively, the soil could be re-used on site for landscaping purposes, dependent on the agreement of the Local Authority.

LIMITATIONS AND RECOMMENDATIONS FOR FURTHER WORK

The ground is seldom homogeneous and variations, which affect our conclusions, may inevitably occur between and beyond the test locations. The risk of significant variations to our Ground Model is considered to be low however should ground conditions vary noticeably from our Ground Model, then we recommend further assessment by a suitably qualified person.

Environmental

No elevated concentrations of contaminants were recorded by this investigation in relation to the relevant propose site user for each part of the site and whilst there is considered to be a low risk of contamination at this site, some areas of the site have not been investigated. A Discovery Strategy should therefore be implemented during demolition and groundworks, and should suspicious soils be encountered, work should cease immediately, and the soils be assessed by a suitably qualified engineer.

Based on the findings of our current investigations and the current proposed development plan, remedial measures are not required in the woodland or in the areas of the proposed gardens and hence a remediation strategy is not currently considered to be required.

Geotechnical

Consideration should be given to undertaking continued groundwater monitoring to record the range of seasonal variations at the site is recommended.

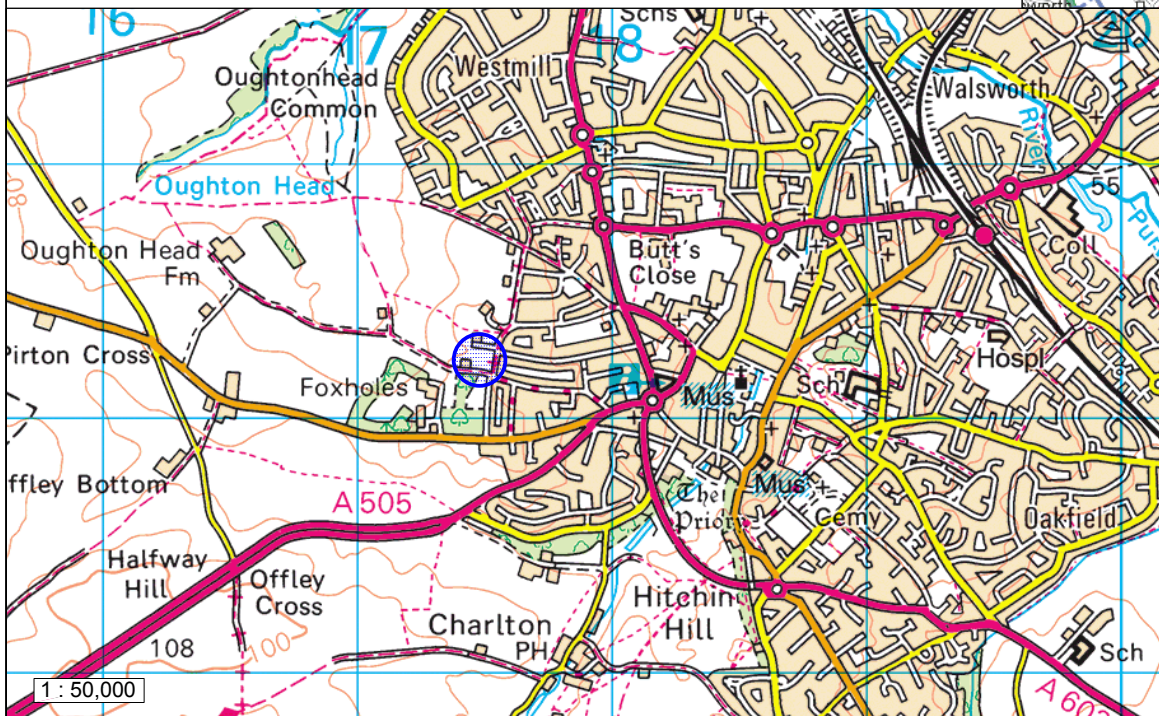
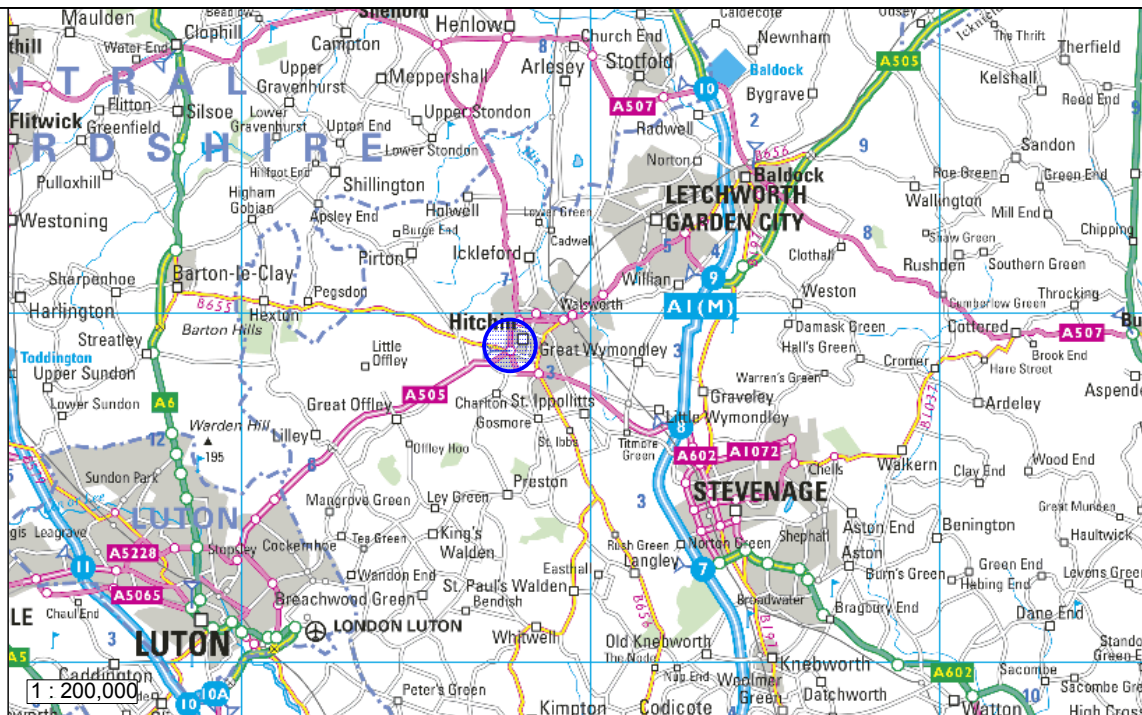
If the use of borehole soakaways emptying into the coarse-grained Glaciofluvial Deposits is to be further considered, then we recommend infiltration testing in the existing standpipes is recommended as a guide to performance.

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APPENDIX A PLANS & PHOTOGRAPHS



Key:



Approximate Site Location



Listers Geotechnical Consultants Ltd www.listersgeotechnics.co.uk Tel: 01327 860060

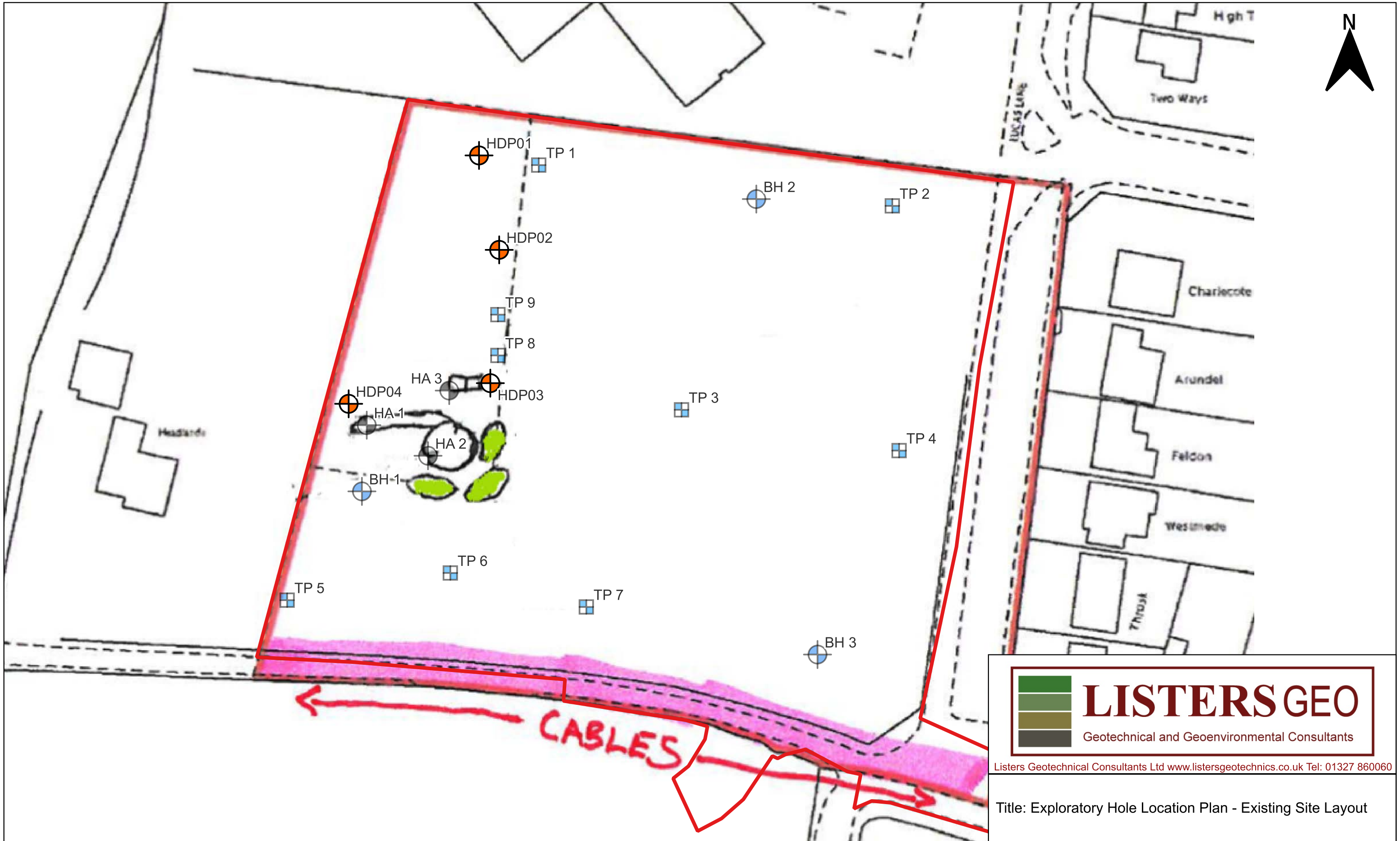
Title: Site Location Plan

Site: Lucas Lane, Hitchin, Hertfordshire, SG5 2HS

Scale: NTS

Job No: 16.07.021

Drawn By: BL





LISTERS GEO
Geotechnical and Geoenvironmental Consultants

Listers Geotechnical Consultants Ltd www.listersgeotechnics.co.uk Tel: 01327 860060

Title: Exploratory Hole Location Plan - Existing Site Layout

Site: Lucas Lane, Hitchin, Hertfordshire, SG5 2HS

Scale: 1:500	Job Number: 16.07.021c	Drawn By: YT
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Key

 Site Boundary

 Cable Tool Percussive Borehole

 Hand-excavated Trial Pit

 Mechanically-excavated Trial Pit

 Hand Auger

Previous Exploratory Positions (16.07.021 - Aug 2016)

Extract from: Land Registry, Title Number HD420790, N.D.



LISTERS GEO

Geotechnical and Geoenvironmental Consultants

Listers Geotechnical Consultants Ltd www.listersgeotechnics.co.uk Tel: 01327 860060

Title: Exploratory Hole Location Plan - Proposed Site Layout

Site: Lucas Lane, Hitchin, Hertfordshire, SG5 2HS

Scale: 1:500	Job Number: 16.07.021c	Drawn By: YT
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Key

Site Boundary

Exploratory Positions

Hand-excavated Trial Pit

Previous Exploratory Positions (16.07.021 - Aug 2016)

Cable Tool Percussive Borehole

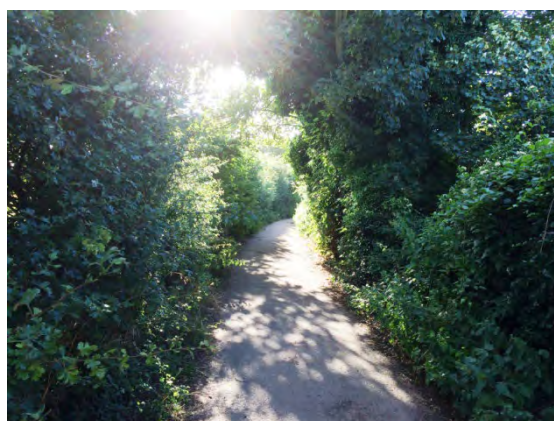
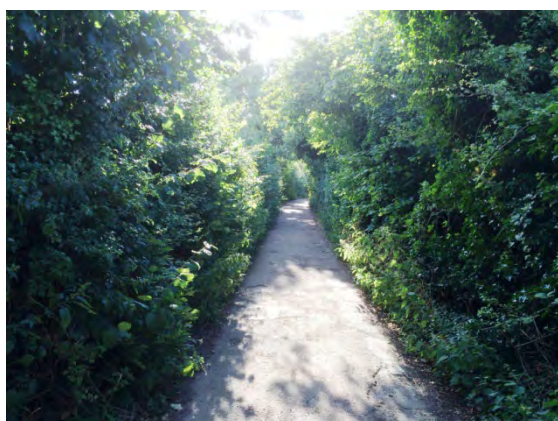
Mechanically-excavated Trial Pit

Hand Auger

Extract from: The Hill Group Drawing No. 112-PS-003 Rev D, titled 'Proposed Site Layout', dated October 2021



Lucas Lane, forming eastern site boundary, with residential properties beyond



Gray's Lane, forming southern site boundary. Mature hedgerows along both sides



The adjacent garden of Headlands, forming the western site boundary

Site Photographs
03/10/2016

Report:
16.07.021



Lavender Fields Care Home, forming northern site boundary. Viewed from Lucas Lane (left) and from south-east corner of the site(right)



Views across the site showing grass cover to body of the site and mature hedgerows along boundaries



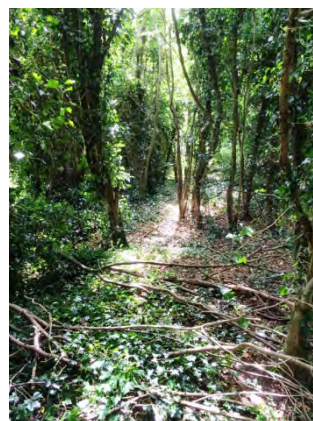
Views across the site showing grass cover to body of the site and mature hedgerows along boundaries

Site Photographs
03/10/2016

Report:
16.07.021



Dense vegetation within the wooded area



Dense vegetation within the wooded area



Circular depression (difficult to see from photographs and very approximately highlighted) from edge of TP 8 – and shallow Made Ground at surface within that pit

Site Photographs
03/10/2016

Report:
16.07.021



Metal tanks within the wooded area



Manhole, on Lucas Lane, used as survey datum



Views across the site from north-eastern corner



Dense vegetation within the wooded area of the site and (on the left-hand image) the two galvanised metal containers evident from the first walkover



Fields to the south of the site



Houses on Lucas Lane, east of the site



Views of the site from the western area of site



Dense vegetation within the wooded area of the site and and (on the right hand image) localised tree felling.



Showing shallow Made Ground soils



Houses on Lucas Lane, west of the site

APPENDIX B

FIELDWORK AND TESTING

Cable Percussive Borehole Log

Borehole No.

BH 1
Project Location: Lucas Lane, Hitchin, Hertfordshire SG5 2HS

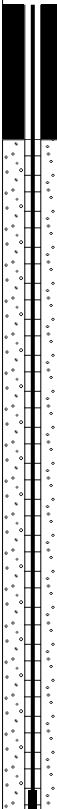
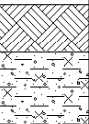
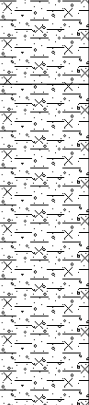
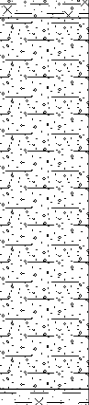
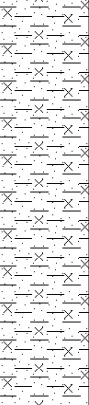
Co-ords: 517454E - 229209N

Project Number:
16.07.021

Level: 92.20 mAOD

Logged By:
Dates: 08/08/2016

 Matthew Clarke
to BS 5930:2015

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Result					
		0.50	D		0.35	91.85		TOPSOIL Dry, friable, brown, slightly gravelly, slightly sandy, slightly organic silty CLAY, with occasional rootlets. Gravel is flint and, rarely, brick.	
		0.80	D						
		1.50 - 1.95	D		1.50	90.70		GLACIOFLUVIAL DEPOSITS Stiff, friable, orange-brown, slightly gravelly, slightly sandy, silty CLAY. Gravel is fine to medium, sub-angular to rounded, flint.	1
		1.50	SPT	N=20 (1,2/5,5,5,5)					
		2.20	D						
		2.50 - 2.95	B						
		3.20	D					GLACIOFLUVIAL DEPOSITS Stiff, orange-brown, slightly gravelly, sandy, silty CLAY. Gravel is fine, sub-angular, flint.	2
		3.50 - 3.95	D						
		3.50	SPT	N=23 (1,1/2,7,7,7)					
		4.00 - 4.40	B		4.00	88.20			
		4.50 - 4.95	D					GLACIOFLUVIAL DEPOSITS Dense, light orange-brown, clayey, slightly gravelly, fine SAND, with occasional pockets of sandy clay. Gravel is fine, sub-angular, flint.	3
		4.50	SPT	N=36 (4,4/7,9,10,10)					
		5.25	D						
		5.50 - 5.95	D						
		5.50	SPT	N=31 (1,3/4,7,10,10)					
		6.20	D					GLACIAL CHANNEL DEPOSITS Very stiff, grey-brown, slightly sandy, silty CLAY.	4
		6.50 - 6.95	D						
		6.50	SPT	N=33 (1,2/3,8,9,13)	6.75	85.45			
		7.00 - 7.40	B						
		7.50 - 7.95	D						5
		7.50	SPT	N=34 (3,7/7,7,10,10)					
		8.25	D						
		8.50 - 8.95	D						
		8.50	SPT	N=38 (3,4/4,10,11,13)					
		9.30	D						6
		9.50 - 9.95	D						
		9.50	SPT	N=43 (4,7/10,10,11,12)					

Borehole Diameter: 150mm

Borehole Casing Depth: 3.50m

Chiselling:
Instrumentation: 50mm diameter standpipe installed to 6.00m depth

Groundwater: None encountered

Remarks: Inspection pit excavated to 1.20m


Cable Percussive Borehole Log

Borehole No.

BH 1
Project Location: Lucas Lane, Hitchin, Hertfordshire SG5 2HS

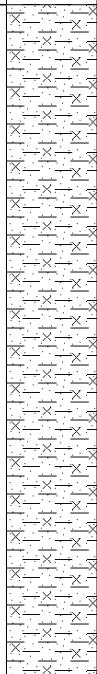
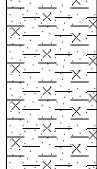
Co-ords: 517454E - 229209N

Project Number:
16.07.021

Level: 92.20 mAOD

Logged By:
Matthew Clarke
to BS 5930:2015

Dates: 08/08/2016

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Result					
		10.10	D					GLACIAL CHANNEL DEPOSITS Very stiff, grey-brown, slightly sandy, silty CLAY.	
		10.50 - 10.95	D						
		10.50	SPT	N=46 (1,7/10,11,10,15)					
		11.00 - 12.00	B						11
		12.00 - 12.44	D						
		12.00	SPT	N=50 (4,7/10,10,13,17)					12
		13.00 - 13.40	D						13
		13.50 - 13.95	D						
		13.50	SPT	N=50 (1,11/11,14,14,11)					14
		14.00 - 14.40	B						
		14.50 - 14.95	D						
		14.50	SPT	N=50 (10,14/14,14,15,7)	15.00	77.20		End of Borehole at 15.00m	15
									16
									17
									18
									19
									20

Borehole Diameter: 150mm

Borehole Casing Depth: 3.50m

Chiselling:
Instrumentation: 50mm diameter standpipe installed to 6.00m depth

Groundwater: None encountered

Remarks: Inspection pit excavated to 1.20m


Cable Percussive Borehole Log

Borehole No.

BH 2
Project Location: Lucas Lane, Hitchin, Hertfordshire SG5 2HS

Co-ords: 517512E - 229252N

Project Number:
16.07.021

Level: 90.55 mAOD

Logged By:

 Matthew Clarke
to BS 5930:2015

Dates: 08/08/2016

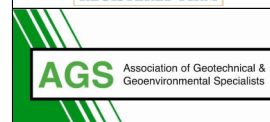
Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Result					
		0.20 - 0.50	D		0.20	90.35		TOPSOIL Dry, friable, brown, slightly gravelly, slightly sandy, slightly organic silty CLAY, with occasional rootlets. Gravel is flint.	
		1.20 - 1.65	D					GLACIOFLUVIAL DEPOSITS	1
		1.20	SPT	N=21 (4,4/4,5,5,7)				Stiff, friable, orange-brown, slightly gravelly, sandy, silty CLAY. Gravel is fine to medium, sub-angular to rounded, flint.	
		1.75	D						
		2.00 - 2.45	D						2
		2.00	SPT	N=22 (1,4/4,5,5,8)					
		2.65	D		2.70	87.85			
		3.00 - 3.45	D					GLACIOFLUVIAL DEPOSITS	3
		3.00	SPT	N=8 (1,1/1,2,2,3)				Loose, light orange-brown, very clayey, slightly gravelly, fine to medium SAND, with rare pockets of sandy clay. Gravel is fine to medium sub-angular, flint and ironstone.	
		3.50 - 4.00	B						
		4.00 - 4.45	D						4
		4.00	SPT	N=9 (1,3/3,2,2,2)					
		4.85	D		5.00	85.55			
		5.00 - 5.45	D					GLACIOFLUVIAL DEPOSITS	5
		5.00	SPT	N=17 (2,3/3,3,4,7)				Medium dense, becoming dense below 7.0m, light orange-brown, clayey, slightly gravelly, fine to medium SAND, with rare pockets of sandy clay. Gravel is fine, sub-angular, flint and, occasionally, limestone.	
		5.65	D						6
		6.00 - 6.45	D						
		6.00	SPT	N=28 (3,4/5,6,7,10)					
		6.85	D						
		7.00 - 7.45	D						7
		7.00	SPT	N=35 (5,7/7,8,7,13)				- very clayey below 7.00m	
		7.50 - 8.00	B						
		8.00 - 8.45	D						8
		8.00	SPT	N=39 (4,7/9,9,11,10)					
		8.90	D						
		9.00 - 9.45	D						9
		9.00	SPT	N=39 (7,10/10,9,10,10)					
		9.90	D		9.75	80.80			
		10.00 - 10.45	D					GLACIAL CHANNEL DEPOSITS	10

Borehole Diameter: 150mm

Borehole Casing Depth: 3.50m

Chiselling:
Instrumentation: Backfilled with arisings

Groundwater: None encountered

Remarks: Inspection pit excavated to 1.20m


Cable Percussive Borehole Log

Borehole No.

BH 2
Project Location: Lucas Lane, Hitchin, Hertfordshire SG5 2HS

Co-ords: 517512E - 229252N

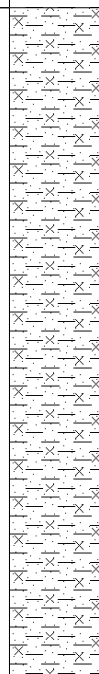
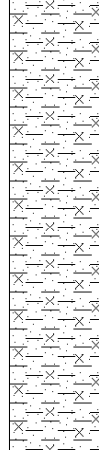
Project Number:
16.07.021

Level: 90.55 mAOD

Logged By:

 Matthew Clarke
to BS 5930:2015

Dates: 08/08/2016

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Result					
		10.00	SPT	N=47 (7,7/7,10,15,15)	15.00	75.55		Very stiff, grey-brown, sandy, silty CLAY.	
		10.90	D						11
		11.50 - 11.95	D						
		11.50	SPT	N=49 (10,13/13,12,12,12)					12
		12.00	D						
		13.00 - 13.45	D						13
		13.00	SPT	N=50 (9,11/10,11,14,15)	15.00	75.55			14
		13.90	D						
		14.50 - 14.95	D						15
		14.50	SPT	N=50 (7,10/10,15,15,10)					15
		End of Borehole at 15.00m							15
									16
									17
									18
									19
									20

Borehole Diameter: 150mm

Borehole Casing Depth: 3.50m

Chiselling:
Instrumentation: Backfilled with arisings

Groundwater: None encountered

Remarks: Inspection pit excavated to 1.20m


Cable Percussive Borehole Log

Borehole No.

BH 3
Project Location: Lucas Lane, Hitchin, Hertfordshire SG5 2HS

Co-ords: 517521E - 229185N

Project Number:
16.07.021

Level: 90.25 mAOD

Logged By:
Dates: 09/08/2016

 Matthew Clarke
to BS 5930:2015

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Result					
		0.20			0.20	90.05		TOPSOIL Dry, friable, brown, slightly gravelly, slightly sandy, slightly organic silty CLAY, with occasional rootlets. Gravel is flint.	
		0.50	D					GLACIOFLUVIAL DEPOSITS Stiff, friable, orange-brown, slightly gravelly, sandy, silty CLAY. Gravel is fine to medium, sub-angular to rounded, flint.	1
		1.20 - 1.65	D						
		1.20	SPT	N=22 (1,2/2,4,8,8)					
		1.75 - 1.90	D						2
		2.20 - 2.65	D						
		2.20	SPT	N=20 (1,2/2,4,7,7)					
		2.80	D						
		3.00 - 3.45	B		3.00	87.25		GLACIOFLUVIAL DEPOSITS Loose, light orange-brown, very clayey, gravelly, fine to medium SAND, with rare pockets of sandy clay. Gravel is fine, sub-angular, flint and ironstone.	3
		3.80	D						
		4.00 - 4.45	D						4
		4.00	SPT	N=8 (1,2/2,1,2,3)					
		4.65	D						
		5.00 - 5.45	D		5.00	85.25		GLACIOFLUVIAL DEPOSITS Medium dense, light orange-brown, clayey, slightly gravelly, fine SAND, with occasional pockets of sandy clay. Gravel is fine, sub-angular, flint and, occasionally, limestone.	5
		5.00	SPT	N=11 (1,2/2,3,3,3)					
		5.50 - 6.00	B		5.50	84.75		GLACIOFLUVIAL DEPOSITS Stiff, friable, orange-brown, slightly gravelly, sandy, silty CLAY. Gravel is fine to medium, sub-angular to rounded, flint.	6
		6.00 - 6.45	D						
		6.00	SPT	N=23 (1,4/4,5,6,8)					
		6.70	D						
		7.00 - 7.45	D		6.85	83.40		GLACIOFLUVIAL DEPOSITS Medium dense, light orange-brown, very clayey, slightly gravelly, fine to medium SAND, with occasional pockets of sandy clay. Gravel is fine, sub-angular, flint and, occasionally, limestone.	7
		7.00	SPT	N=38 (4,7/7,10,10,11)					
		7.75	D						
		8.00 - 8.45	D						8
		8.00	SPT	N=39 (3,5/5,10,11,13)					
		8.50 - 8.80	B						
		9.00 - 9.45	D						9
		9.00	SPT	N=39 (4,7/7,7,11,14)					
		9.90	D						
		10.00 - 10.45	D						10

Borehole Diameter: 150mm

Borehole Casing Depth: 6.00m

Chiselling:
Instrumentation: 50mm diameter standpipe installed to 6.00m depth

Groundwater: None encountered

Remarks: Inspection pit excavated to 1.20m


Cable Percussive Borehole Log

Borehole No.

BH 3
Project Location: Lucas Lane, Hitchin, Hertfordshire SG5 2HS

Co-ords: 517521E - 229185N

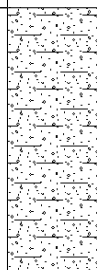
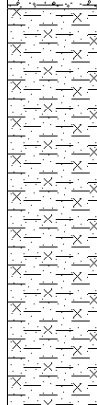
Project Number:
16.07.021

Level: 90.25 mAOD

Logged By:

 Matthew Clarke
to BS 5930:2015

Dates: 09/08/2016

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Result					
		10.00	SPT	N=43 (2,10/10,10,11,12)	12.00	78.25		GLACIOFLUVIAL DEPOSITS Medium dense, light orange-brown, very clayey, slightly gravelly, fine to medium SAND, with occasional pockets of sandy clay. Gravel is fine, sub-angular, flint and, occasionally, limestone.	11
		11.00	D						
		11.50 - 11.95 11.50	D SPT	N=50 (10,11/11,12,12,15)					12
		12.50	D		15.00	75.25		GLACIAL CHANNEL DEPOSITS Very stiff, grey-brown, sandy, silty CLAY.	13
		13.00 - 13.45 13.00	D SPT	N=50 (3,12/12,12,14,12)					14
		14.00	D						15
		14.50 - 14.95 14.50	D SPT	N=50 (11,11/11,12,14,13)				End of Borehole at 15.00m	16
								17	
								18	
								19	
								20	

Borehole Diameter: 150mm

Borehole Casing Depth: 6.00m

Chiselling:
Instrumentation: 50mm diameter standpipe installed to 6.00m depth

Groundwater: None encountered

Remarks: Inspection pit excavated to 1.20m


Test Location	Depth at Start of Test (m)	Spoon or Cone	Blows per 75mm Penetration				N' Value	Stratum
BH 1	1.50	S	5	5	5	5	20	GFD
	3.50	S	2	7	7	7	23	
	4.50	S	7	9	10	10	36	
	5.50	S	4	7	10	10	31	
	6.50	S	3	8	9	13	33	
	7.50	S	7	7	10	10	34	GCD
	8.50	S	4	10	11	13	38	
	9.50	S	10	10	11	12	43	
	10.50	S	10	11	10	15	46	
	12.00	S	10	10	13	17	50	
	13.50	S	11	14	14	11	50	
	14.50	S	14	14	15	7	50	
BH 2	1.20	S	4	5	5	7	21	GFD
	2.00	S	4	5	5	8	22	
	3.00	S	1	2	2	3	8	
	4.00	S	3	2	2	2	9	
	5.00	S	3	3	4	7	17	GCD
	6.00	S	5	6	7	10	28	
	7.00	S	7	8	7	13	35	
	8.00	S	9	9	11	10	39	
	9.00	S	10	9	10	10	39	
	10.00	S	7	10	15	15	47	
	11.50	S	13	12	12	12	49	
	13.00	S	10	11	14	15	50	
	14.50	S	10	15	15	10	50	
BH 3	1.20	S	2	4	8	8	22	GFD
	2.20	S	2	4	7	7	20	
	4.00	S	2	1	2	3	8	
	5.00	S	2	3	3	3	11	
	6.00	S	4	5	6	8	23	
	7.00	S	7	10	10	11	38	
	8.00	S	5	10	11	13	39	
	9.00	S	7	7	11	14	39	
Key: MG = Made Ground OxC = Oxford Clay * = N-value extrapolated								
STANDARD PENETRATION TESTS						Report: 16.07.021 Sheet 1 of 2		

Test Location	Depth at Start of Test (m)	Spoon or Cone	Blows per 75mm Penetration				N' Value	Stratum
BH 3	10.00	S	10	10	11	12	43	GFD
	11.50	S	11	12	12	15	50	
	13.00	S	12	12	14	12	50	GCD
	14.50	S	11	12	14	13	50	
Key: MG = Made Ground OxC = Oxford Clay * = N-value extrapolated								
STANDARD PENETRATION TESTS							Report: 16.07.021 Sheet 2 of 2	

Hand Auger Log

Borehole No.

HA 1
Project Location: Lucas Lane, Hitchin, Hertfordshire SG5 2HS

Co-ords:
Level:
Dates: 08/08/2016

Project Number:
16.07.021

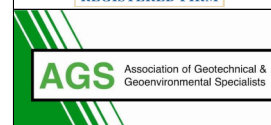
Logged By:
Matthew Clarke
to BS 5930:2015

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth (m)	Type	(kPa)					
	0.25	D		0.26			MADE GROUND Light brown, very sandy GRAVEL, with occasional roots. Gravel is fine to coarse, sub-angular to sub-rounded, flint, brick and concrete.	
	0.60	D		0.61			MADE GROUND Light brown and orange-brown, slightly clayey, sandy GRAVEL, with rare fine roots. Gravel is fine to coarse, sub-angular to sub-rounded, flint, brick and concrete.	
	1.00	D		1.00			MADE GROUND Orange-brown, slightly clayey, sandy GRAVEL. Gravel is fine to coarse, sub-angular to sub-rounded, flint, brick, concrete and chalk.	
							End of Borehole at 1.00m	1
								2

Method of excavation: Dutch hand auger

Stability: Sides Stable

Groundwater: None encountered

Hand Auger Dimensions:
Remarks: Depth of visible roots: 0.50


Hand Auger Log

Borehole No.

HA 2
Project Location: Lucas Lane, Hitchin, Hertfordshire SG5 2HS

Co-ords:
Level:
Dates: 08/08/2016

Project Number:
16.07.021

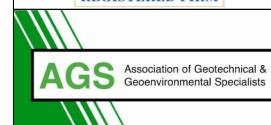
Logged By:
Matthew Clarke
to BS 5930:2015

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth (m)	Type	(kPa)					
	0.30	D		0.32			MADE GROUND Light grey-brown, very sandy GRAVEL, with occasional roots. Gravel is fine to medium, sub-angular to sub-rounded, flint, brick and concrete.	
	0.60	D		0.60			MADE GROUND Light brown and orange-brown, very sandy GRAVEL, with occasional roots. Gravel is fine to medium coarse, sub-angular to sub-rounded, flint, brick and concrete.	
	1.00	D		1.00			MADE GROUND Orange-brown, slightly clayey, sandy GRAVEL. Gravel is fine to coarse flint, brick and concrete.	
							End of Borehole at 1.00m	1
								2

Method of excavation: Dutch hand auger

Stability: Sides Stable

Groundwater: None encountered

Hand Auger Dimensions:
Remarks: Depth of visible roots: 0.60m


Hand Auger Log

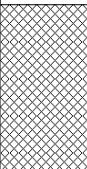
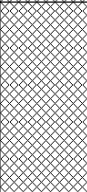
Borehole No.

HA 3
Project Location: Lucas Lane, Hitchin, Hertfordshire SG5 2HS

Co-ords:
Level:
Dates: 08/08/2016

Project Number:
16.07.021

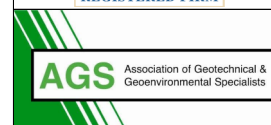
Logged By:
Matthew Clarke
to BS 5930:2015

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth (m)	Type	(kPa)					
	0.25	D		0.28			MADE GROUND Light grey-brown, slightly clayey, sandy GRAVEL, with occasional roots. Gravel is fine to coarse, sub-angular to sub-rounded, flint, brick and concrete.	
	0.60	D		0.60			MADE GROUND Orange-brown, very sandy, slightly clayey GRAVEL, with rare fine roots. Gravel is fine to coarse, sub-angular to sub-rounded, flint and concrete.	
							End of Borehole at 0.60m	

Method of excavation: Dutch hand auger

Stability: Sides Stable

Groundwater: None encountered

Hand Auger Dimensions:
Remarks: Depth of visible roots: 0.50m
Concrete obstruction at 0.60m - no further progress possible


Trial Pit Log

Trial Pit No.
TP 1
Project Location: Lucas Lane, Hitchin, Hertfordshire SG5 2HS

Co-ords: 517480E - 229257N

Project Number:
16.07.021

Level: 91.65 mAOD

Logged By:

 Matthew Clarke
to BS 5930:2015

Dates: 08/08/2016

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth (m)	Type	(kPa)					
	0.10	D		0.20	91.45		TOPSOIL Dry, friable, brown, slightly gravelly, slightly sandy, slightly organic, silty CLAY, with occasional roots.	
	0.50	CBR					GLACIALFLUVIAL DEPOSITS Very stiff, desiccated, friable, orange-brown, slightly gravelly, slightly sandy, silty CLAY. Gravel (c. 20%) is fine to medium, angular to sub-rounded, flint.	
	1.00	D		0.90	90.75		GLACIOFLUVIAL DEPOSITS Stiff, orange-brown, slightly gravelly, slightly sandy, silty CLAY, with occasional cobbles of flint. Locally sandy. Gravel is fine to coarse, angular to sub-rounded, flint.	1
	1.50	D		1.45	90.20		GLACIOFLUVIAL DEPOSITS Orange-brown, silty, very sandy GRAVEL, with occasional cobbles of flint. Gravel is fine to coarse, angular or sub-rounded, flint.	
	2.00	D		2.20	89.45		GLACIOFLUVIAL DEPOSITS Loose, brown and orange-brown, slightly silty, fine to medium SAND, with occasional to rare cobbles of flint.	2
	2.50	D						
	3.00	D		2.95	88.70		GLACIOFLUVIAL DEPOSITS Stiff, fissured, grey-brown silty, CLAY, with many small pockets of lignite.	3
				3.10	88.55		End of Trial Pit at 3.10m	
								4

Method of excavation: New Holland 8t tyred backhoe excavator 110B

Stability: Sides Stable

Groundwater: None encountered

Trial Pit Dimensions: 2.5x0.7x3.1m

Remarks: Too gravelly for hand vane test.
Backfilled with arisings on completion


Trial Pit Log

Trial Pit No.
TP 2
Project Location: Lucas Lane, Hitchin, Hertfordshire SG5 2HS

Co-ords: 517532E - 229251N

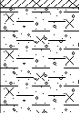
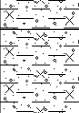
Project Number:
16.07.021

Level: 89.90 mAOD

Logged By:

 Matthew Clarke
to BS 5930:2015

Dates: 08/08/2016

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth (m)	Type	(kPa)					
	0.20	D	84	0.35	89.55		TOPSOIL Dry, friable, brown, slightly gravelly, slightly sandy, slightly organic silty CLAY, with some rootlets. Gravel is of flint and brick.	
	0.50	D					GLACIOFLUVIAL DEPOSITS Firm, becoming stiff below 0.5m, friable, orange-brown, slightly gravelly, slightly sandy, silty CLAY. Gravel is fine to medium, angular to sub-rounded, flint.	
	0.75	HV					...more gravel below 0.9m	1
	1.00	D		1.10	88.80		GLACIOFLUVIAL DEPOSITS Stiff, orange-brown, slightly gravelly, slightly sandy to sandy, silty CLAY, with occasional cobbles of flint. Gravel is fine to medium, angular to sub-rounded, flint.	
	1.50	D					...very stiff below 1.4m	
	2.00	D		2.00	87.90		End of Trial Pit at 2.00m	2
								3
								4

Method of excavation: New Holland 8t tyred backhoe excavator 110B

Stability: Stable (before test)

Groundwater: None encountered

Trial Pit Dimensions: 1.8x0.7x2.0m

Remarks: Soakage test at 2.0m
Backfilled with arisings on completion


Trial Pit Log

Trial Pit No.
TP 3
Project Location: Lucas Lane, Hitchin, Hertfordshire SG5 2HS

Co-ords: 517501E - 229221N

Project Number:
16.07.021

Level: 90.85 mAOD

Logged By:

 Matthew Clarke
to BS 5930:2015

Dates: 08/08/2016

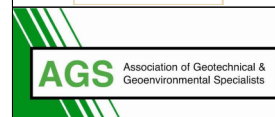
Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth (m)	Type	(kPa)					
	0.10	D		0.30	90.55		TOPSOIL Dry, friable, brown, slightly gravelly, slightly sandy, slightly organic silty CLAY, with some rootlets. Gravel is of flint and brick.	
	0.50 0.50	CBR HV	114				GLACIOFLUVIAL DEPOSITS Stiff, friable, orange-brown, slightly gravelly, slightly sandy, silty CLAY. Gravel is fine to medium, angular to sub-rounded, flint and chalk.	1
	1.00 1.00	D HV	105	1.20	89.65			
	1.50	D					GLACIOFLUVIAL DEPOSITS Stiff, orange-brown, slightly gravelly, slightly sandy to sandy, silty CLAY, with occasional cobbles of flint and occasional black specks. Gravel is fine to medium, angular to sub-rounded, flint. Becoming more sandy with depth and slightly gravelly (but <5%).	2
	2.00 2.00	D D		2.10	88.75			
							End of Trial Pit at 2.10m	3
								4

Method of excavation: New Holland 8t tyred backhoe excavator 110B

Stability: Sides Stable

Groundwater: None encountered

Trial Pit Dimensions: 1.7x0.7x2.1m

Remarks: Soakage test at 2.0m
Backfilled with arisings on completion


Trial Pit Log

Trial Pit No.

TP 4
Project Location: Lucas Lane, Hitchin, Hertfordshire SG5 2HS

Co-ords: 517533E - 229215N

Project Number:
16.07.021

Level: 89.95 mAOD

Logged By:
Dates: 08/08/2016

 Matthew Clarke
to BS 5930:2015

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth (m)	Type	(kPa)					
	0.10	D		0.20	89.75		TOPSOIL Dry, friable, brown, slightly gravelly, slightly sandy, slightly organic silty CLAY, with rare fragments of ceramic tile and some rootlets. Gravel is of flint and brick.	
	0.50	D					GLACIOFLUVIAL DEPOSITS Stiff, friable, orange-brown, slightly gravelly, slightly sandy, silty CLAY. Gravel is fine to coarse, angular to sub-rounded, flint.	
	1.00	D						1
	1.50	D		1.45	88.50		GLACIOFLUVIAL DEPOSITS Stiff, friable, orange-brown, slightly gravelly, slightly sandy, silty CLAY. Gravel is fine to medium, angular to sub-rounded, flint and chalk. Locally gravelly, with occasional cobbles of flint.	
	2.00	D		2.10	87.85			2
							End of Trial Pit at 2.10m	
								3
								4

Method of excavation: New Holland 8t tyred backhoe excavator 110B

Stability: Sides Stable

Groundwater: None encountered

Trial Pit Dimensions: 1.7x0.7x2.05

Remarks: Too stiff and gravelly for hand vane tests. Soakage test at 2.05m. Backfilled with arisings on completion


Trial Pit Log

Trial Pit No.

TP 5
Project Location: Lucas Lane, Hitchin, Hertfordshire SG5 2HS

Co-ords: 517443E - 229193N

Project Number:
16.07.021

Level: 92.60 mAOD

Logged By:
Dates: 08/08/2016

 Matthew Clarke
to BS 5930:2015

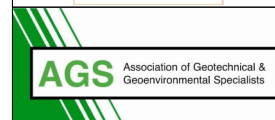
Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth (m)	Type	(kPa)					
	0.10	D		0.20	92.40		TOPSOIL Dry, friable, brown, slightly gravelly, slightly sandy, slightly organic silty CLAY, with some rootlets. Gravel is of flint and brick.	
	0.50 0.50	CBR HV	>120				GLACIOFLUVIAL DEPOSITS Very stiff, friable, orange-brown, slightly gravelly, slightly sandy to sandy, silty CLAY. Gravel is fine to medium, angular to sub-rounded, flint and, occasionally, chalk.	
	1.00 1.00	D HV	>120	0.80	91.80		GLACIOFLUVIAL DEPOSITS Stiff, orange-brown, slightly gravelly, slightly sandy to sandy, silty CLAY, with occasional cobbles of flint. Gravel (<5%) is fine to medium, angular to sub-rounded, flint.	1
	1.50	D						
				1.80	90.80			
	2.00	D		2.10	90.50		GLACIOFLUVIAL DEPOSITS Stiff, yellow-brown sandy, CLAY with occasional pockets of orange-brown sandy clay.	2
							End of Trial Pit at 2.10m	
								3
								4

Method of excavation: New Holland 8t tyred backhoe excavator 110B

Stability: Sides Stable

Groundwater: None encountered

Trial Pit Dimensions: 2.0x0.7x2.1m

Remarks: Backfilled with arisings on completion


Trial Pit Log

Trial Pit No.
TP 6
Project Location: Lucas Lane, Hitchin, Hertfordshire SG5 2HS

Co-ords: 517467E - 229197N

Project Number:
16.07.021

Level: 92.00 mAOD

Logged By:
Dates: 08/08/2016

 Matthew Clarke
to BS 5930:2015

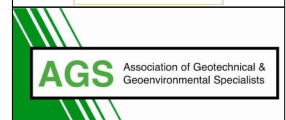
Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth (m)	Type	(kPa)					
	0.10	D		0.25	91.75		TOPSOIL Dry, friable, brown, slightly gravelly, slightly sandy, slightly organic silty CLAY, with rare rootlets. Gravel is of flint.	
	0.50	D					GLACIOFLUVIAL DEPOSITS Stiff, friable, orange-brown, slightly gravelly, slightly sandy, silty CLAY. Gravel is fine to medium, angular to sub-rounded, flint and chalk. Locally gravelly, locally sandy. Occasional cobbles of flint.	1
	0.75	HV	120					
	1.00	D						
	1.25	HV	120					
	1.50	D						
	2.05	D		2.00	90.00		GLACIOFLUVIAL DEPOSITS Loose, orange-brown, silty, slightly gravelly, fine to medium SAND. Gravel is fine to medium flint.	2
	2.50	D						
				2.95	89.05		GLACIOFLUVIAL DEPOSITS Firm, fissured, thinly laminated, yellow-brown and orange-brown, slightly gravelly, slightly sandy to sandy, silty CLAY, with occasional iron-staining. Gravel is flint.	3
				3.20	88.80		End of Trial Pit at 3.20m	4

Method of excavation: New Holland 8t tyred backhoe excavator 110B

Stability: Sides Stable

Groundwater: None encountered

Trial Pit Dimensions: 2.6x0.7x3.2

Remarks: Backfilled with arisings on completion


Trial Pit Log

Trial Pit No.

TP 7
Project Location: Lucas Lane, Hitchin, Hertfordshire SG5 2HS

Co-ords: 517487E - 229192N

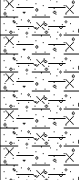
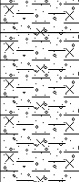
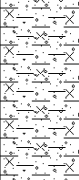
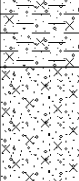
Project Number:
16.07.021

Level: 91.55 mAOD

Logged By:

 Matthew Clarke
to BS 5930:2015

Dates: 08/08/2016

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth (m)	Type	(kPa)					
	0.10	D		0.25	91.30		TOPSOIL Dry, friable, brown, slightly gravelly, slightly sandy, slightly organic silty CLAY, with some rootlets. Gravel is of flint and brick.	
	0.50	CBR					GLACIOFLUVIAL DEPOSITS Stiff, friable, orange-brown, slightly gravelly, slightly sandy, silty CLAY, with occasional cobbles of flint. Gravel is fine to medium, angular to sub-rounded, flint.	
	1.00	D		0.90	90.65		GLACIOFLUVIAL DEPOSITS Stiff, orange-brown, slightly gravelly, sandy, silty CLAY, with occasional cobbles of flint and occasional black specks. Gravel is fine to medium, angular to sub-rounded, flint.	1
	1.50	D						
	2.00	D		2.10	89.45		GLACIOFLUVIAL DEPOSITS Orange-brown, very silty, slightly gravelly SAND. Gravel (6%) is fine to medium flint.	2
	2.50	D						
	3.00	D		3.10	88.45			3
							End of Trial Pit at 3.10m	4

Method of excavation: New Holland 8t tyred backhoe excavator 110B

Stability: Sides Stable

Groundwater: None encountered

Trial Pit Dimensions: 2.5x0.7x3.1m

Remarks: Too gravelly for hand vane test
Backfilled with arisings on completion


Trial Pit Log

Trial Pit No.

TP 8
Project Location: Lucas Lane, Hitchin, Hertfordshire SG5 2HS

Co-ords: 517474E - 229229N

Project Number:
16.07.021

Level: 91.85 mAOD

Logged By:
Dates: 08/08/2016

 Matthew Clarke
to BS 5930:2015

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth (m)	Type	(kPa)					
	0.20	D		0.10	91.75		TOPSOIL Dry, friable, brown, slightly gravelly, slightly sandy, slightly organic silty CLAY, with some rootlets. Gravel is of flint and brick.	
	0.60	D		0.50	91.35		MADE GROUND Stiff, friable, orange-brown, slightly gravelly, slightly sandy, silty CLAY. Gravel is fine to medium, angular to sub-rounded, flint, glass fragments and rare metal can pieces, rare ceramic tiles and brick masonry (cobble-silty) and metal artefacts (gate hinge and padlock).	
				1.00	90.85		GLACIOFLUVIAL DEPOSITS Desiccated, orange-brown, very clayey, very sandy GRAVEL. Gravel is fine to medium, angular to sub-rounded, flint.	1
							End of Trial Pit at 1.00m	2
								3
								4

Method of excavation: New Holland 8t tyred backhoe excavator 110B

Stability: Sides Stable

Groundwater: None encountered

Trial Pit Dimensions: 2.7x0.7x1.0

Remarks: No further progress possible - overhead trees
Backfilled with arisings on completion


Trial Pit Log

Trial Pit No.

TP 9
Project Location: Lucas Lane, Hitchin, Hertfordshire SG5 2HS

Co-ords: 517474E - 229235N

Project Number:
16.07.021

Level: 91.80 mAOD

Logged By:
Dates: 08/08/2016

 Matthew Clarke
to BS 5930:2015

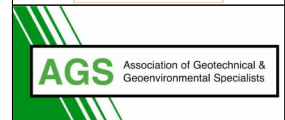
Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth (m)	Type	(kPa)					
	0.15			0.15	91.65		TOPSOIL Dry, friable, brown, slightly gravelly, slightly sandy, slightly organic silty CLAY, with some rootlets. Gravel is of flint and brick.	
	0.50	D					GLACIOFLUVIAL DEPOSITS Desiccated, orange-brown, very clayey sandy GRAVEL with roots and rootlets. Gravel is fine to medium, angular to sub-rounded, flint.	1
	1.00	D						
	1.20			1.20	90.60		End of Trial Pit at 1.20m	2
								3
								4

Method of excavation: New Holland 8t tyred backhoe excavator 110B

Stability: Sides Stable

Groundwater: None encountered

Trial Pit Dimensions: 2.2x0.7x1.2

Remarks: Backfilled with arisings on completion


Trial Pit Log

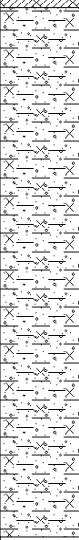
Trial Pit No.
HDP01
Project Location: Lucas Lane, Hitchin, Hertfordshire, SG5 2HS

Co-ords: 517471E - 229258N

Project Number:
16.07.021c

Level:
Logged By:
Dates: 31/01/2025

 Yuki Tse
to BS 5930:2015

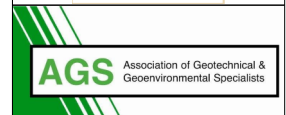
Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth (m)	Type	Result					
	0.20	D		0.30			TOPSOIL Dark brown slightly gravelly slightly sandy CLAY with frequent rootlets. Gravel is fine subangular and subrounded of flint, chalk, rare coal and brick.	
	0.50	D		1.00			GLACIOFLUVIAL DEPOSITS Orange brown slightly sandy slightly gravelly silty CLAY with frequent roots and rootlets. Gravel is angular to subrounded of flint. <i>- becoming gravelly below 0.50m depth</i>	
							End of Trial Pit at 1.00m	1

Method of excavation: Hand Excavated

Dimensions: 0.40m(W) x 0.40m(L) x 1.00m(D)

Stability: Sides stable

Groundwater: Not encountered

Remarks: Backfilled with lightly compacted arisings upon completion.


Trial Pit Log

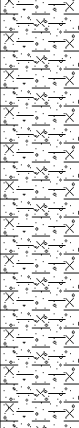
Trial Pit No.
HDP02
Project Location: Lucas Lane, Hitchin, Hertfordshire, SG5 2HS

Co-ords: 517474E - 229245N

Project Number:
16.07.021c

Level:
Logged By:
Dates: 31/01/2025

 Yuki Tse
to BS 5930:2015

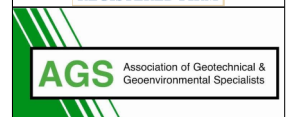
Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth (m)	Type	Result					
	0.20	D					TOPSOIL Dark brown slightly gravelly slightly sandy CLAY with occasional rootlets. Gravel is fine subangular and subrounded of flint, chalk, rare coal and brick.	
				0.30			MADE GROUND Soft orange brown slightly sandy slightly gravelly CLAY. Gravel is fine and medium of flint and brick	
	0.50	D		0.40			GLACIOFLUVIAL DEPOSITS Orange brown slightly sandy gravelly silty CLAY with frequent rootlets. Gravel is angular to subrounded of flint, chalk and rare sandstone.	
				1.00			End of Trial Pit at 1.00m	1

Method of excavation: Hand Excavated

Dimensions: 0.40m(W) x 0.40m(L) x 1.00m(D)

Stability: Sides stable

Groundwater: Not encountered

Remarks: Backfilled with lightly compacted arisings upon completion.


Trial Pit Log

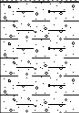
Trial Pit No.
HDP03
Project Location: Lucas Lane, Hitchin, Hertfordshire, SG5 2HS

Co-ords: 517473E - 229225N

Project Number:
16.07.021c

Level:
Logged By:
Dates: 31/01/2025

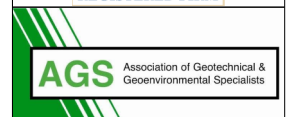
 Yuki Tse
to BS 5930:2015

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth (m)	Type	Result					
	0.20	D					TOPSOIL Dark brown slightly sandy slightly gravelly silty CLAY with frequent rootlets. Gravel is subangular and subrounded fine and medium of flint, chalk and red brick	
	0.40	D					MADE GROUND Light brown slightly sandy gravelly CLAY with frequent roots and rootlets. Gravel is angular to subrounded of flint, sandstone and brick.	
							GLACIOFLUVIAL DEPOSITS Orange brown slightly sandy gravelly CLAY with low cobble content. Gravel and cobbles are angular to sub-rounded of flint.	
				0.80			End of Trial Pit at 0.80m	

Method of excavation: Hand Excavated **Dimensions:** 0.40m(W) x 0.40m(L) x 0.80m(D)

Stability: Sides stable

Groundwater: Not encountered

Remarks: Backfilled with lightly compacted arisings upon completion.


Trial Pit Log

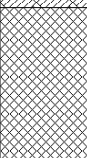
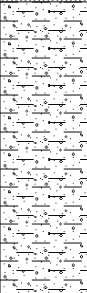
Trial Pit No.
HDP04
Project Location: Lucas Lane, Hitchin, Hertfordshire, SG5 2HS

Co-ords: 517452E - 229222N

Project Number:
16.07.021c

Level:
Logged By:
Dates: 31/01/2025

 Yuki Tse
to BS 5930:2015

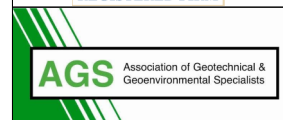
Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth (m)	Type	Result					
	0.20	D					TOPSOIL Dark brown slightly sandy slightly gravelly silty CLAY with frequent rootlets. Gravel is subangular and subrounded fine and medium of flint, chalk and red brick	
	0.40	D					MADE GROUND Light brown slightly sandy gravelly CLAY with frequent roots and rootlets. Gravel is angular to subrounded of flint, sandstone and brick.	
							GLACIOFLUVIAL DEPOSITS Orange brown slightly sandy gravelly CLAY with low cobble content. Gravel is angular to subrounded of flint and fine chalk. Cobble is subangular of flint.	
				0.90			End of Trial Pit at 0.90m	1

Method of excavation: Hand Excavated

Dimensions: 0.40m(W) x 0.40m(L) x 0.90m(D)

Stability: Sides stable

Groundwater: Not encountered

Remarks: Backfilled with lightly compacted arisings upon completion.


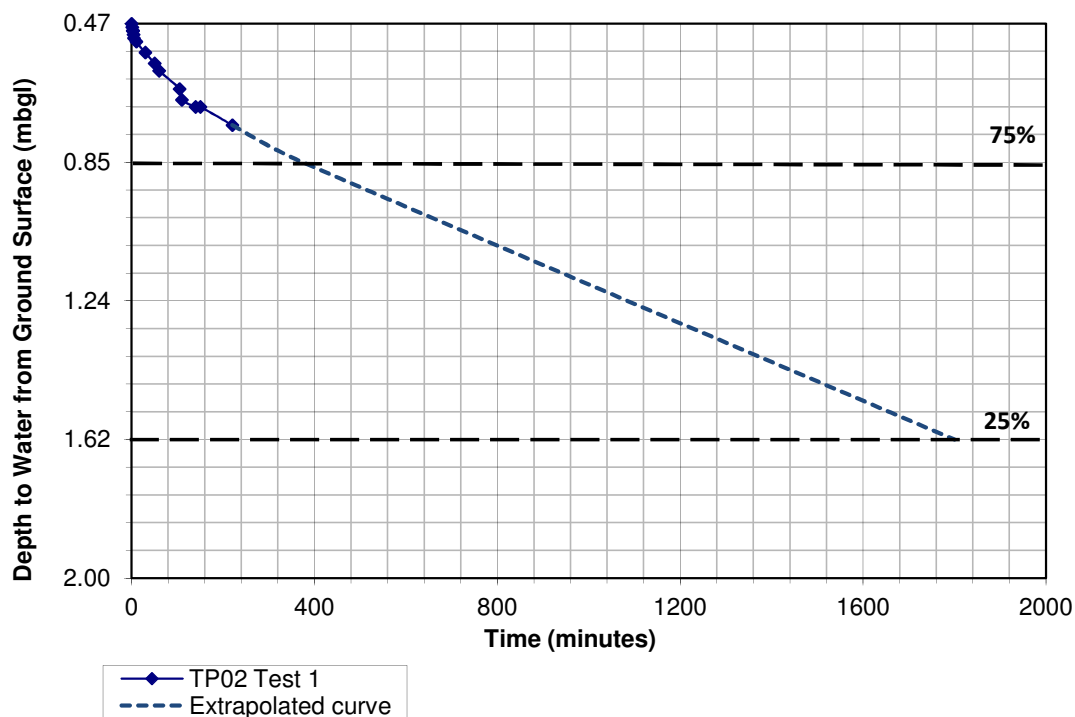
Client: Hill Residential Ltd **Report No:** 16.07.021
Site: Land at Lucas Lane, Hitchin **Date Tested:** 08/08/2016
Dimensions: 0.7mW x 1.8mL x 2.00m deep **Test Location:** TP 2 Test 1
Groundwater: unknown

Soil Description - test response zone:

Stiff, orange-brown, slightly gravelly, slightly sandy, silty CLAY, with occasional cobbles of flint.

Time (mins)	Depth BGL	Time (mins)	Depth BGL	Time (mins)	Depth BGL
0	0.47	30	0.55	220	0.75
1	0.48	50	0.58		
2	0.49	60	0.60		
3	0.49	105	0.65		
4	0.50	110	0.68		
5	0.51	140	0.70		
10	0.52	150	0.70		

Calculated Soil Infiltration Rate, $f = 2.22 \times 10^{-6}$ m/s



**TRIAL PIT INFILTRATION TESTING
to BRE Digest 365**

Report:
16.07.021

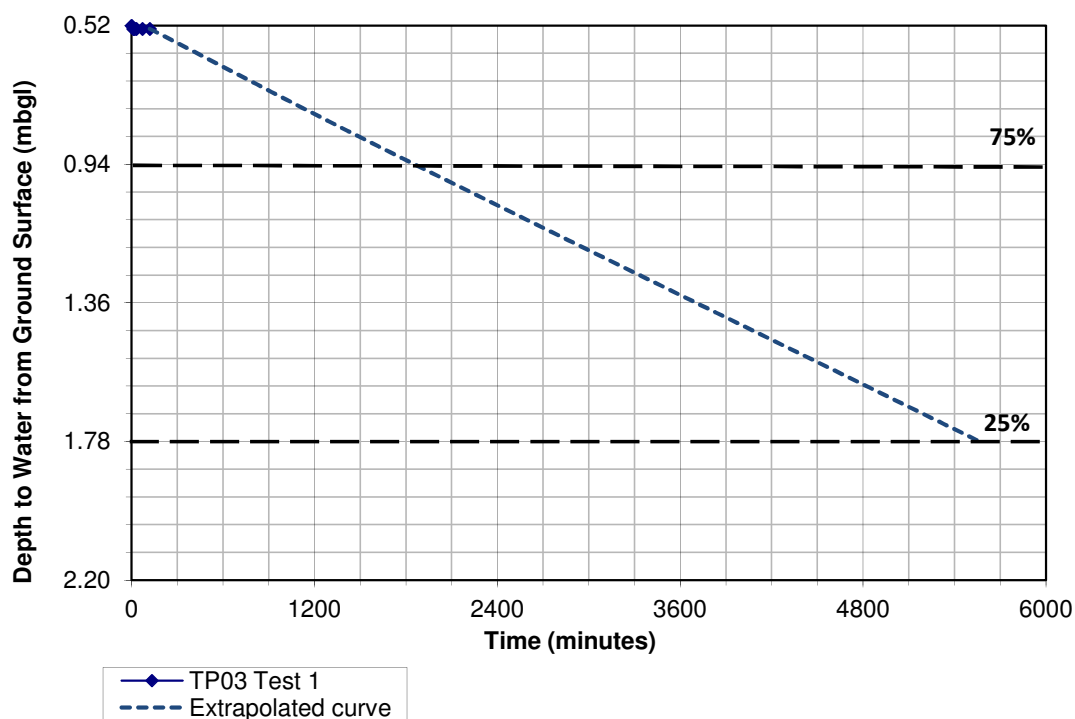
Client: Hill Residential Ltd **Report No:** 16.07.021
Site: Land at Lucas Lane, Hitchin **Date Tested:** 08/08/2016
Dimensions: 0.7mW x 1.6mL x 2.20m deep **Test Location:** TP 3 Test 1
Groundwater: unknown

Soil Description - test response zone:

Stiff, orange-brown, slightly gravelly, slightly sandy, silty CLAY, with occasional cobbles of flint.

Time (mins)	Depth BGL	Time (mins)	Depth BGL	Time (mins)	Depth BGL
0	0.52				
10	0.53				
15	0.53				
20	0.53				
30	0.53				
70	0.53				
120	0.53				

Calculated Soil Infiltration Rate, $f = 8.48 \times 10^{-7}$ m/s



TRIAL PIT INFILTRATION TESTING
to BRE Digest 365

Report:
 16.07.021

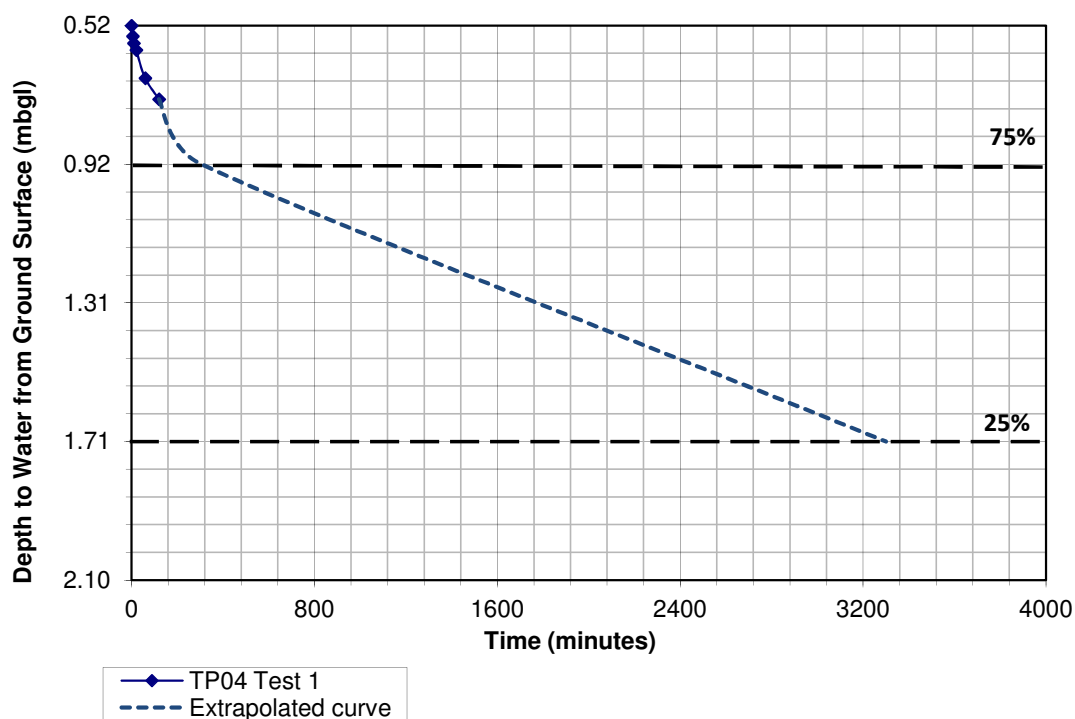
Client: Hill Residential Ltd **Report No:** 16.07.021
Site: Land at Lucas Lane, Hitchin **Date Tested:** 08/08/2016
Dimensions: 0.7mW x 1.6mL x 2.10m deep **Test Location:** TP 4 Test 1
Groundwater: unknown

Soil Description - test response zone:

Stiff, orange-brown, slightly gravelly, slightly sandy, silty CLAY, with occasional cobbles of flint.

Time (mins)	Depth BGL	Time (mins)	Depth BGL	Time (mins)	Depth BGL
0	0.52				
5	0.55				
10	0.57				
20	0.59				
60	0.67				
120	0.73				

Calculated Soil Infiltration Rate, $f = 1.04 \times 10^{-6}$ m/s



TRIAL PIT INFILTRATION TESTING
to BRE Digest 365

Report:
 16.07.021

Date	Weather	Test Location	Methane CH ₄ (%v/v)	Carbon Dioxide CO ₂ (%v/v)	Oxygen O ₂ (%v/v)	Atmospheric Pressure (mBar)	Flow (l/h)	Water Level (m bgl)
01/09/2016	Warm, dry and sunny	BH 1	<0.1	2.7	19.4	1013	0.6	Dry
		BH 2	<0.1	0.9	20.5	1013	0.5	Dry
12/09/2016	Mild, cloudy and raining	BH 1	<0.1	3.2	18.9	1002	0.4	Dry
		BH 2	<0.1	0.9	19.8	1002	0.6	Dry
Gas measurements taken using a portable Geotech GA5000 gas monitor								
GAS MONITORING RESULTS							Report No. 16.07.021	

APPENDIX C

LABORATORY TEST REPORTS

GroundTech Laboratories

Geotechnical Testing Facility

Slapton Hill Barn, Blakesley Road, Slapton, Towcester, Northants. NN12 8QD

Telephone:- 01327 860947/860060 Fax:- 01327 860430 Email: groundtech@listersgeotechnics.co.uk

PROJECT INFORMATION		SAMPLE INFORMATION																																																							
Site Location:- Lucas Lane Hitchin Hertfordshire SG15 2JA	Laboratory Tests Undertaken:- <table border="1"> <thead> <tr> <th>TEST TYPE</th> <th>TEST METHOD</th> <th>TESTED</th> </tr> </thead> <tbody> <tr> <td>Natural Moisture Contents (MC%)</td> <td>(BS 1377:Part 2:1990 Clause 3.2)</td> <td>✓</td> </tr> <tr> <td>Liquid Limits (%)</td> <td>(BS 1377:Part 2:1990 Clause 4.3)</td> <td>✓</td> </tr> <tr> <td>Plastic Limits (%)</td> <td>(BS 1377:Part 2:1990 Clause 5.3)</td> <td>✓</td> </tr> <tr> <td>Plasticity Index (%)</td> <td>(BS 1377:Part 2:1990 Clause 5.4)</td> <td>✓</td> </tr> <tr> <td>Linear Shrinkage (%)</td> <td>(BS 1377:Part 2:1990 Clause 6.5)</td> <td></td> </tr> <tr> <td>PSD - Wet Sieving</td> <td>(BS 1377:Part 2:1990 Clause 9.2)</td> <td>✓</td> </tr> <tr> <td>Engineering Sample Descriptions</td> <td>(BS 5930 : Section 6)</td> <td></td> </tr> <tr> <td>Passing 425/63 (µm)</td> <td>-</td> <td>✓</td> </tr> <tr> <td>Hydrometer</td> <td>(BS 1377:Part 2:1990 Clause 9.5)</td> <td></td> </tr> <tr> <td>Loss on Ignition (%)</td> <td>-</td> <td></td> </tr> <tr> <td>Soil Suctions (kPa)</td> <td>BRE Digest IP 4/93, 1993</td> <td></td> </tr> <tr> <td>Bulk Density (Mg/m³)</td> <td>(BS 1377:Part 2:1990 Clause 7.2)</td> <td></td> </tr> <tr> <td>Strength Tests</td> <td>(BS 1377:Part 7:1990 Clause 8 & 9)</td> <td></td> </tr> <tr> <td>Soluble Sulphate Content (SO₄g/l)</td> <td>(BS 1377:Part 3:1990 Clause 5.3)</td> <td>✓</td> </tr> <tr> <td>pH value</td> <td>(BS 1377:Part 3:1990 Clause 9.4)</td> <td>✓</td> </tr> <tr> <td>California Bearing Ratios (CBR)</td> <td>(BS 1377:Part 4:1990 Clause 7)</td> <td>✓</td> </tr> <tr> <td>Compaction Tests</td> <td>(BS 1377:Part 4:1990 Clauses 3.0-3.6)</td> <td></td> </tr> </tbody> </table>	TEST TYPE	TEST METHOD	TESTED	Natural Moisture Contents (MC%)	(BS 1377:Part 2:1990 Clause 3.2)	✓	Liquid Limits (%)	(BS 1377:Part 2:1990 Clause 4.3)	✓	Plastic Limits (%)	(BS 1377:Part 2:1990 Clause 5.3)	✓	Plasticity Index (%)	(BS 1377:Part 2:1990 Clause 5.4)	✓	Linear Shrinkage (%)	(BS 1377:Part 2:1990 Clause 6.5)		PSD - Wet Sieving	(BS 1377:Part 2:1990 Clause 9.2)	✓	Engineering Sample Descriptions	(BS 5930 : Section 6)		Passing 425/63 (µm)	-	✓	Hydrometer	(BS 1377:Part 2:1990 Clause 9.5)		Loss on Ignition (%)	-		Soil Suctions (kPa)	BRE Digest IP 4/93, 1993		Bulk Density (Mg/m ³)	(BS 1377:Part 2:1990 Clause 7.2)		Strength Tests	(BS 1377:Part 7:1990 Clause 8 & 9)		Soluble Sulphate Content (SO ₄ g/l)	(BS 1377:Part 3:1990 Clause 5.3)	✓	pH value	(BS 1377:Part 3:1990 Clause 9.4)	✓	California Bearing Ratios (CBR)	(BS 1377:Part 4:1990 Clause 7)	✓	Compaction Tests	(BS 1377:Part 4:1990 Clauses 3.0-3.6)			
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Client Reference:- -																																																									
Date Samples Received:- 9th August 2016 Date Testing Completed:- 6th September 2016																																																									
The results relate only to the samples tested																																																									
This test-report may not be reproduced, except with full and written approval of GROUNDTECH LABORATORIES		Laboratory testing in accord with BS EN ISO/IEC 17025-2000 and Quality Management in accord with ISO 9001																																																							
Signed on behalf of GroundTech Laboratories:- _____ Technical Signatory			Quality Assured to ISO 9001																																																						
GEOTECHNICAL LABORATORY TEST RESULTS		Report No:	16.07.021																																																						

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SAMPLES				CLASSIFICATION TESTS							CLASSIFICATION TESTS							STRENGTH TESTS					CHEMICAL TESTS		
Test Location	Sample Type	Sample Depth -m	Test Type	MC %	LL %	PL %	PI %	Passing 425 μm %	Modified PI %	Class	Passing 63 μm %	MC/ LL	PL+ 2%	Liquidity Index	Loss on Ignition %	Soil Suction kPa	Bulk Density Mg/m3	Test Type	Cell Pressure kN/m2	Deviator Stress kN/m2	Apparent Cohesion kN/m2	φ	pH Value	Soluble Sulphate Content SO4 g/l	
BH 1	D	0.50	PI/63	9.7	31	20	11	100	11	CL	47	0.45	22	-0.55									7.2	0.15	
	D	0.80		7.1																					
	D	1.50		11																					
	D	2.20		11																					
	B	2.50	PSD	14	31	20	11	100	11	CL	47	0.45	22	-0.55											
	D	3.20		15																					
	D	3.50		16																					
	B	4.00		16																					
	D	4.50	PI/63	6	30	21	9	100	9	CL	96	0.67	23	-0.11											
	D	5.25		14																					
	D	5.50		6.1																					
	D	6.20		17																					
	D	6.50	PI/63	9.2	28	21	7	100	7	ML	87	0.96	23	0.86											
	B	7.00		20																					
	D	7.50		20																					
	D	8.25		21																					
	D	8.50	PI/63	20	29	24	5	100	5	ML	92	0.72	26	-0.60											
	D	9.30		27																					
	D	9.50		17																					
	D	10.10		21																					
D	10.50	PI/63	19																						
B	11.00		21																						
D	12.00		18																						
D																									
Symbols:				U	Undisturbed Sample					R	Remoulded				PI	Plasticity Index		T	Triaxial Undrained			L	100mm specimen		
				D	Disturbed Sample					63	Passing 63μm				F	Filter Paper Suction Tests		M	Multistage Triaxial			S	38mm specimen		
				B	Bulk Sample					H	Hydrometer				CC	Continuous Core		HP	Hand Penetrometer						
				W	Water Sample					PSD	Wet Sieving							V	Vane Test						
LABORATORY TEST RESULTS																				Project Reference 16.07.021					

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BH 1	D	13.00	PI/63	21	34	19	15	100	15	CL	97	0.62	21	0.13												
	D	13.50		16																						
	B	14.00		19																						
	D	14.50		20																						
BH 2	D	0.20	PI/63	10	32	16	16	82	13	CL	51	0.31	18	-0.38									7.6	0.12		
	D	1.20		14																						
	D	1.75		14																						
	D	2.00		9.3																						
	D	2.65		12																						
	D	3.00		11																						
	B	3.50	PSD	13																						
	D	4.00		11																						
	D	4.85		13																						
	D	5.00		14																						
	D	5.65	PSD	16																						
	D	6.00		15																						
	D	6.85		13																						
	D	7.00		8.4																						
	B	7.50	PSD	15																			7.8	0.08		
	D	8.00		15																						
	D	8.90		11																						
	D	9.00		9.3																						
	D	9.90		15																						
Symbols:				U	Undisturbed Sample					R	Remoulded				PI	Plasticity Index			T	Triaxial Undrained				L	100mm specimen	
				D	Disturbed Sample					63	Passing 63μm				F	Filter Paper Suction Tests			M	Multistage Triaxial				S	38mm specimen	
				B	Bulk Sample					H	Hydrometer				CC	Continuous Core			HP	Hand Penetrometer						
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BH 2	D	10.00	PI/63	12	28	22	6	100	6	ML	75	0.64	24	-0.67												
	D	10.90		13																						
	D	11.50		10																						
	D	12.00		18																						
	D	13.00		13																						
BH 3	D	13.90	PI/63	17	28	17	11	85	9	CL	48	0.61	19	0.00												
		D		14.50																					11	
		D		0.50																					15	
		D		1.20																					17	
		D		1.75																					14	
		D	2.20	9.7																						
		D	2.80	14																						
		B	3.00	PSD																					13	
		D	3.80																						13	
		D	4.00																						11	
		D	4.65																						14	
		D	5.00																						12	
		B	5.50	PI/63	17	32	15	17	74	13	CL	24	0.53	17	0.12											
		D	6.00	23																						
		D	6.70	18																						
		D	7.00	11																						
		D	7.75	PSD	16																					
		D	8.00		13																					
Symbols:				U	Undisturbed Sample					R	Remoulded				PI	Plasticity Index			T	Triaxial Undrained				L	100mm specimen	
				D	Disturbed Sample					63	Passing 63μm				F	Filter Paper Suction Tests			M	Multistage Triaxial				S	38mm specimen	
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BH 3	B	8.50	PSD	13	21	18	3	87	3	ML	30	0.81	20	-0.33											
	D	9.00		15																					
	D	9.90		10																					
	D	10.00		9.7																					
	D	11.00		10																					
	D	11.50	11																						
	D	12.50	PI/63	17																					
	D	13.00		7.9																					
	D	14.00		13																					
	D	14.50		9.4																					
HA 1	D	0.25		12																					
	D	0.60	9.4																						
	D	1.00	11																						
HA 2	D	0.30	8.8	28	16	12	42	5	CL	21	0.25	18	-0.74												
	D	0.60	7.2																						
	D	1.00	12																						
HA 3	D	0.25	11																						
	D	0.60	8.8																						
	D	0.10	8.7																						
TP 1	CBR	0.50	PI/63																						7.1
		1.00																							6.4
		1.50																							7.6
		2.00																							PSD
Symbols:				U	Undisturbed Sample				R	Remoulded				PI	Plasticity Index			T	Triaxial Undrained				L	100mm specimen	
				D	Disturbed Sample				63	Passing 63μm				F	Filter Paper Suction Tests			M	Multistage Triaxial				S	38mm specimen	
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Test Location	Sample Type	Sample Depth -m	Test Type	MC %	LL %	PL %	PI %	Passing 425 μm %	Modified PI %	Class	Passing 63 μm %	MC/ LL	PL+ 2%	Liquidity Index	Loss on Ignition %	Soil Suction kPa	Bulk Density Mg/m3	Test Type	Cell Pressure kN/m2	Deviator Stress kN/m2	Apparent Cohesion kN/m2	φ	pH Value	Soluble Sulphate Content SO4 g/l		
TP 1	D	2.50	PI/63	8.7	66	22	44	95	42	CH	87	0.32	24	-0.02												
	D	3.00		21																						
TP 2	D	0.20	PI/63	11	38	18	20	67	13	CI	42	0.42	20	-0.10												
	D	0.50		20																						
TP 3	D	1.00	PI/63	16	36	18	18	64	11	CI	30	0.53	20	0.06									7.7	0.06		
	D	1.50	14																							
	D	2.00	19																							
	D	0.10	11																							
TP 4	CBR	0.50	PI/63	20	48	20	28	94	26	CI	76	0.42	22	0.00												
	D	1.00	20																							
	D	1.50	19																							
	D	2.00	19																							
TP 5	D	0.10	PSD	8	38	18	20	91	18	CI	65	0.50	20	0.05												
	D	0.50		12																						
	D	1.00		13																						
	D	1.50		16																						
TP 6	D	2.00	PI/63	20	27	16	11	77	8	CL	45	0.34	18	-0.61												
	D	0.10		14																						
	D	1.00		13																						
	D	1.50		10																						
TP 6	D	2.00	PI/63	26	35	23	12	100	12	CL	96	0.74	25	0.25												
	D	0.10		14																						
Symbols:				U	Undisturbed Sample					R	Remoulded				PI	Plasticity Index			T	Triaxial Undrained				L	100mm specimen	
				D	Disturbed Sample					63	Passing 63μm				F	Filter Paper Suction Tests			M	Multistage Triaxial				S	38mm specimen	
				B	Bulk Sample					H	Hydrometer				CC	Continuous Core			HP	Hand Penetrometer						
				W	Water Sample					PSD	Wet Sieving								V	Vane Test						
LABORATORY TEST RESULTS																					Project Reference 16.07.021					

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Test Location	Sample Type	Sample Depth -m	Test Type	MC %	LL %	PL %	PI %	Passing 425 μm %	Modified PI %	Class	Passing 63 μm %	MC/ LL	PL+ 2%	Liquidity Index	Loss on Ignition %	Soil Suction kPa	Bulk Density Mg/m3	Test Type	Cell Pressure kN/m2	Deviator Stress kN/m2	Apparent Cohesion kN/m2	φ	pH Value	Soluble Sulphate Content SO4 g/l		
TP 6	D	0.50	PI/63	12	37	24	13	49	6	CI	27	0.38	26	-0.77									7.5	0.06		
	D	1.00		14																						
	D	1.50		14																						
	D	2.05		9.9																						
	D	2.50		7																						
TP 7	D	0.10	CBR	13	34	18	16	54	9	CL	26	0.44	20	-0.19									7.3	0.21		
	D	0.50		13																						
	D	1.00		14																						
	D	1.50		15																						
	D	2.00		14																						
TP 8	D	2.50	PSD	13																						
	D	3.00		15																						
	D	0.20		11																						
TP 9	D	0.60	PSD	7.7																						
	D	0.50		11																						
TP 9	D	1.00	PSD	10																						
Symbols:				U	Undisturbed Sample					R	Remoulded				PI	Plasticity Index			T	Triaxial Undrained				L	100mm specimen	
				D	Disturbed Sample					63	Passing 63μm				F	Filter Paper Suction Tests			M	Multistage Triaxial				S	38mm specimen	
				B	Bulk Sample					H	Hydrometer				CC	Continuous Core			HP	Hand Penetrometer						
				W	Water Sample					PSD	Wet Sieving								V	Vane Test						
LABORATORY TEST RESULTS																				Project Reference 16.07.021						

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Test Location	Depth (m)	C.B.R. Value %		Final Moisture Content %	Bulk Density Mg/m3	Dry Density Mg/m3	Remarks
		Top:	Base				
TP 1	0.50	34	20	7	1.62	1.51	Very stiff orange brown, silty, slightly sandy, slightly gravelly CLAY. Gravel is fine to medium sub angular flint.
TP 3	0.50	6.8	8.2	20	1.65	1.37	Firm orange brown, silty, slightly sandy, slightly gravelly CLAY. Gravel is fine to medium sub angular flint and chalk. The gravel retained on the 20mm sieve was 4%.
TP 5	0.50	16	10	9	1.75	1.60	Very stiff orange brown, silty, slightly sandy, slightly gravelly CLAY. Gravel is fine to medium sub angular flint with occasional chalk. The gravel retained on the 20mm sieve was 5%.
TP 7	0.50	14	9.9	13	1.81	1.61	Firm orange brown, silty, slightly sandy, slightly gravelly CLAY. Gravel is fine to medium to occasional cobbled sub angular flint with occasional chalk. The gravel retained on the 20mm sieve was 13%.
Samples recompacted using standard compaction Surcharge 8kg							
CALIFORNIA BEARING RATIO						Report No. 16.07.021	

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Geotechnical Testing Facility

Slapton Hill Barn, Blakesley Road, Slapton, Towcester, Northants. NN12 8QD

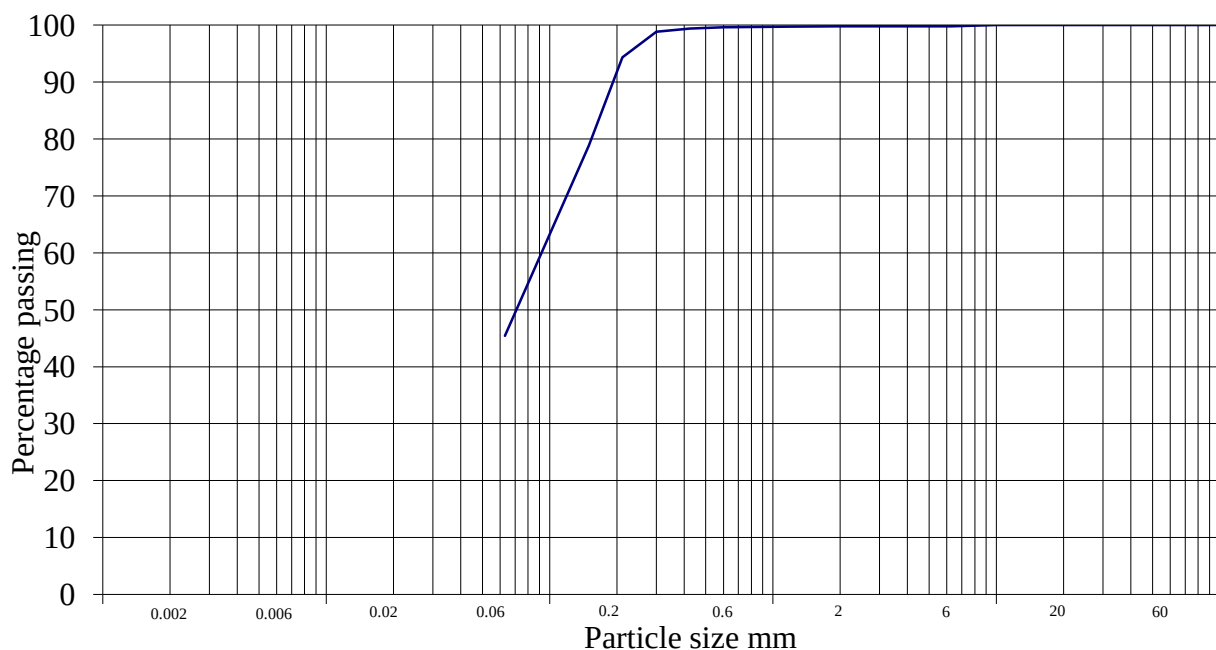
Telephone: 01327 860947/860060

Fax: 01327 860430

Email: groundtech@listersgeotechnics.co.uk

**Quality
Assured
ISO 9001**

		Test Method: BS 1377 : Part 2 : 1990 : 9.2			
		BS test sieve	Cumulative Passing - %	Hydrometer Particle Diameter	Cumulative Passing - %
Site: Lucas Lane, Hitchin, Hertfordshire SG5 2JA Test Location: BH 1 Sample Depth: 4.00m -4.40m Sample Description: Hydrometer No.: SG Gs: Water Visc. (N): Dry Mass of Soil after pretreatment (g):		75mm	100.00		
		63mm	100.00		
		50mm	100.00		
		37.5mm	100.00		
		26.5mm	100.00		
		20mm	100.00		
		14mm	100.00		
		10mm	100.00		
		6.3mm	99.80		
		5mm	99.80		
		3.5mm	99.80		
		2mm	99.80		
		1.18mm	99.70		
		600µm	99.60		
		425µm	99.40		
		300µm	98.80		
		212µm	94.30		
		150µm	78.80		
		63µm	45.40		



CLAY	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	COBBLES
	SILT			SAND			GRAVEL			

PARTICLE SIZE DISTRIBUTION

Project Reference
16.07.021

GroundTech Laboratories

Geotechnical Testing Facility

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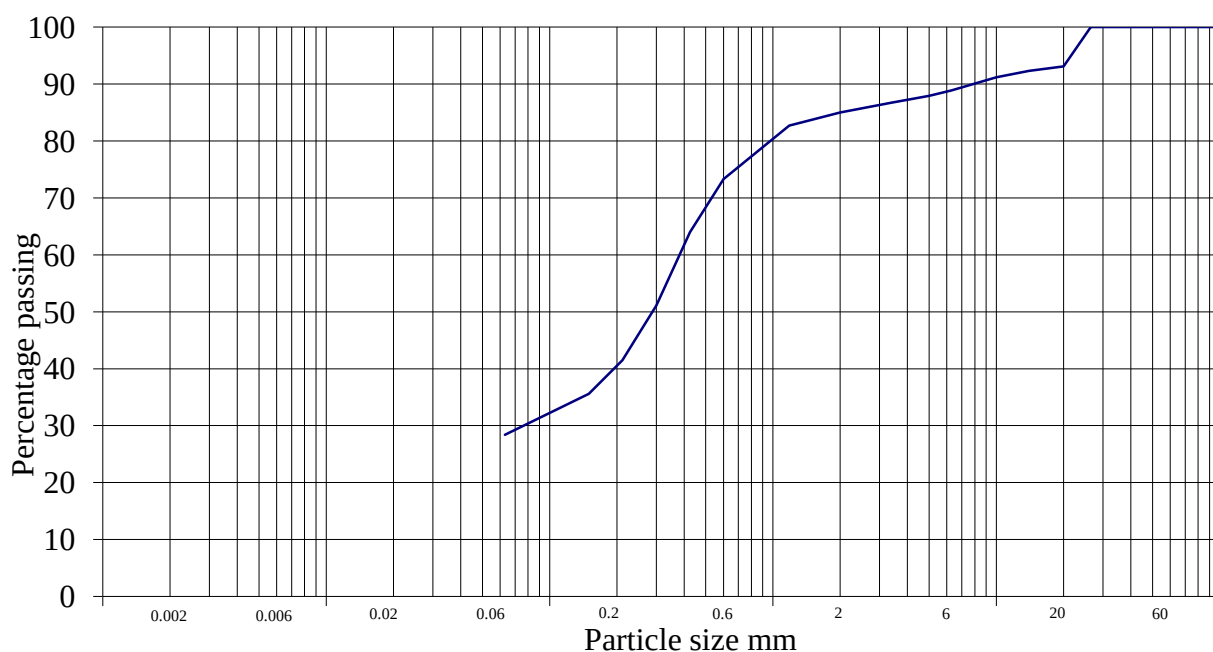
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Email: groundtech@listersgeotechnics.co.uk

**Quality
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ISO 9001**

		Test Method: BS 1377 : Part 2 : 1990 : 9.2			
		BS test sieve	Cumulative Passing - %	Hydrometer Particle Diameter	Cumulative Passing - %
Site: Lucas Lane, Hitchin, Hertfordshire SG5 2JA Test Location: BH 2 Sample Depth: 3.50m -4.00m Sample Description: Hydrometer No.: SG Gs: Water Visc. (N): Dry Mass of Soil after pretreatment (g):		75mm	100.00		
		63mm	100.00		
		50mm	100.00		
		37.5mm	100.00		
		26.5mm	100.00		
		20mm	93.10		
		14mm	92.30		
		10mm	91.20		
		6.3mm	88.90		
		5mm	87.90		
		3.5mm	86.70		
		2mm	85.00		
		1.18mm	82.70		
		600µm	73.30		
		425µm	64.00		
		300µm	51.10		
		212µm	41.50		
		150µm	35.60		
		63µm	28.40		



CLAY	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	COBBLES
	SILT			SAND			GRAVEL			

PARTICLE SIZE DISTRIBUTION

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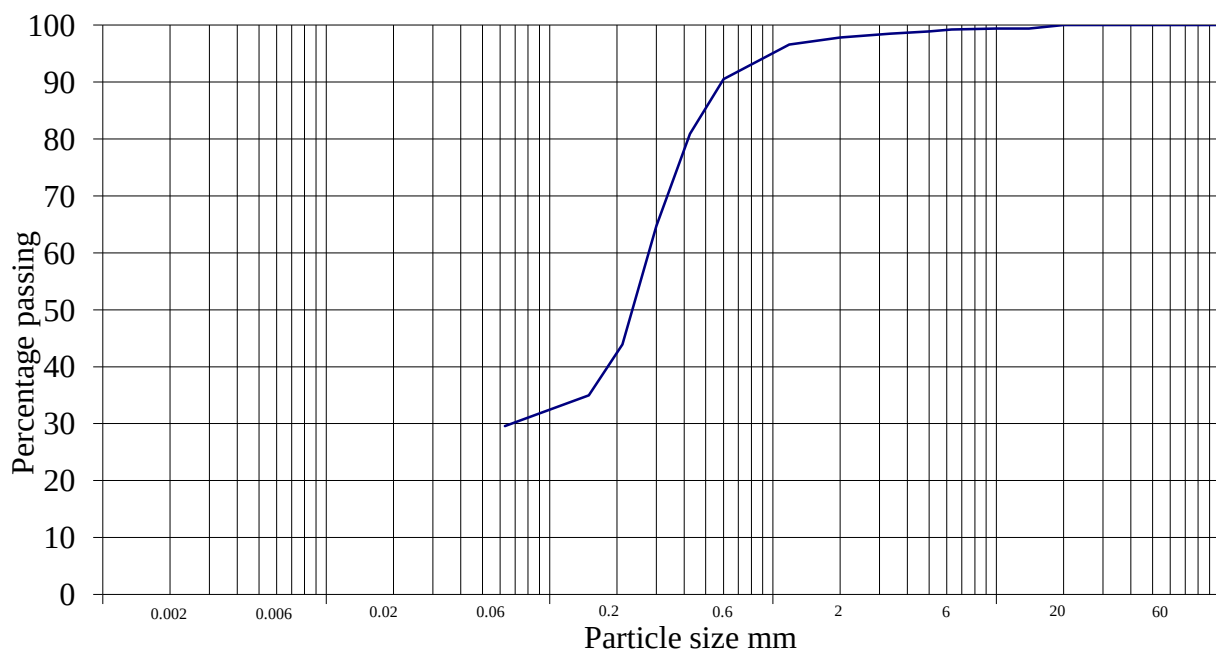
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Email: groundtech@listersgeotechnics.co.uk

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ISO 9001**

		Test Method: BS 1377 : Part 2 : 1990 : 9.2			
		BS test sieve	Cumulative Passing - %	Hydrometer Particle Diameter	Cumulative Passing - %
Site: Lucas Lane, Hitchin, Hertfordshire SG5 2JA Test Location: BH 2 Sample Depth: 5.65m Sample Description: Hydrometer No.: SG Gs: Water Visc. (N): Dry Mass of Soil after pretreatment (g):		75mm	100.00		
		63mm	100.00		
		50mm	100.00		
		37.5mm	100.00		
		26.5mm	100.00		
		20mm	100.00		
		14mm	99.40		
		10mm	99.40		
		6.3mm	99.20		
		5mm	98.90		
		3.5mm	98.50		
		2mm	97.80		
		1.18mm	96.60		
		600µm	90.50		
		425µm	80.90		



CLAY	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	COBBLES
	SILT			SAND			GRAVEL			

PARTICLE SIZE DISTRIBUTION

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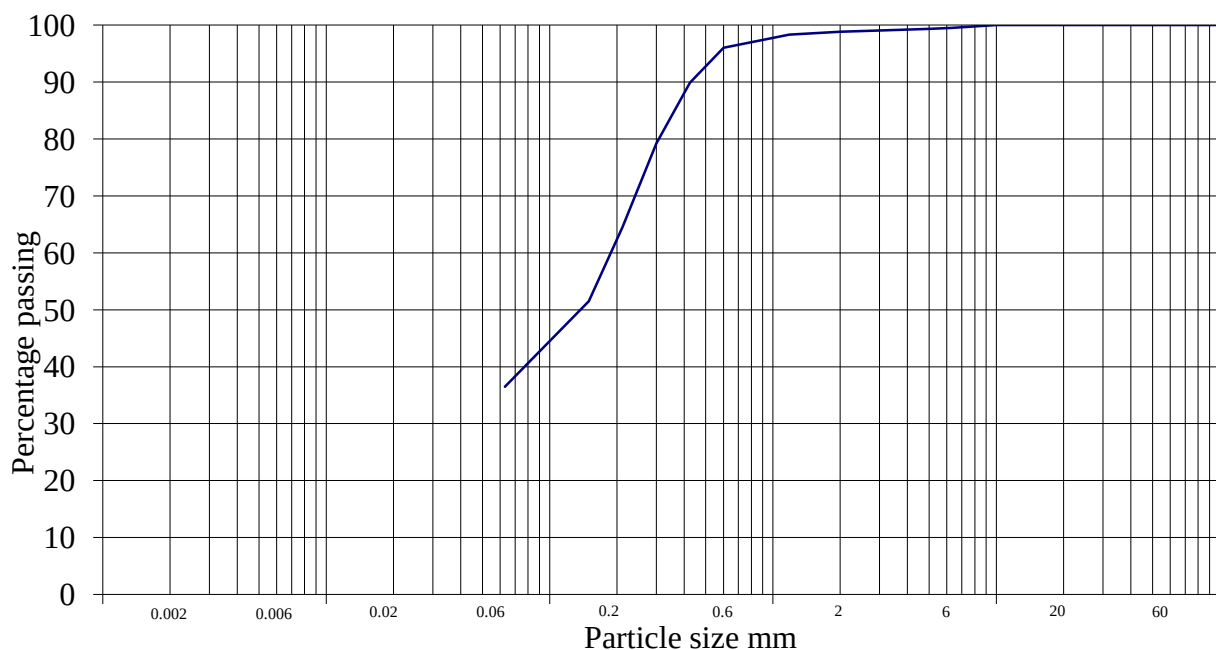
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ISO 9001**

		Test Method: BS 1377 : Part 2 : 1990 : 9.2			
		BS test sieve	Cumulative Passing - %	Hydrometer Particle Diameter	Cumulative Passing - %
Site: Lucas Lane, Hitchin, Hertfordshire SG5 2JA Test Location: BH 2 Sample Depth: 7.50m -8.00m Sample Description: Hydrometer No.: SG Gs: Water Visc. (N): Dry Mass of Soil after pretreatment (g):		75mm	100.00		
		63mm	100.00		
		50mm	100.00		
		37.5mm	100.00		
		26.5mm	100.00		
		20mm	100.00		
		14mm	100.00		
		10mm	100.00		
		6.3mm	99.50		
		5mm	99.30		
		3.5mm	99.10		
		2mm	98.80		
		1.18mm	98.30		
		600µm	96.00		
		425µm	89.90		



CLAY	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	COBBLES
	SILT			SAND			GRAVEL			

PARTICLE SIZE DISTRIBUTION

Project Reference
16.07.021

GroundTech Laboratories

Geotechnical Testing Facility

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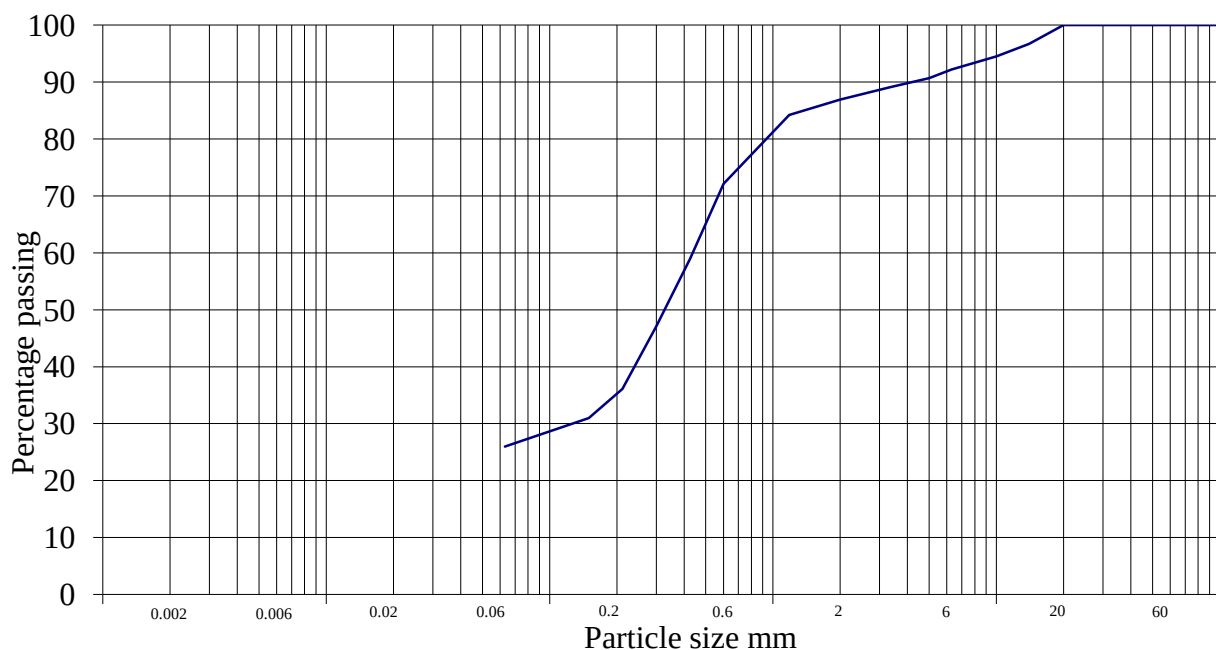
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Email: groundtech@listersgeotechnics.co.uk

**Quality
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ISO 9001**

		Test Method: BS 1377 : Part 2 : 1990 : 9.2			
		BS test sieve	Cumulative Passing - %	Hydrometer Particle Diameter	Cumulative Passing - %
Site: Lucas Lane, Hitchin, Hertfordshire SG5 2JA Test Location: BH 3 Sample Depth: 3.00m -3.45m Sample Description: Hydrometer No.: SG Gs: Water Visc. (N): Dry Mass of Soil after pretreatment (g):		75mm	100.00		
		63mm	100.00		
		50mm	100.00		
		37.5mm	100.00		
		26.5mm	100.00		
		20mm	100.00		
		14mm	96.70		
		10mm	94.50		
		6.3mm	92.20		
		5mm	90.70		
		3.5mm	89.10		
		2mm	86.90		
		1.18mm	84.20		
		600µm	72.10		
		425µm	58.90		
		300µm	47.10		
		212µm	36.10		
		150µm	31.00		
		63µm	26.00		



CLAY	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	COBBLES
	SILT			SAND			GRAVEL			

PARTICLE SIZE DISTRIBUTION

Project Reference
16.07.021

GroundTech Laboratories

Geotechnical Testing Facility

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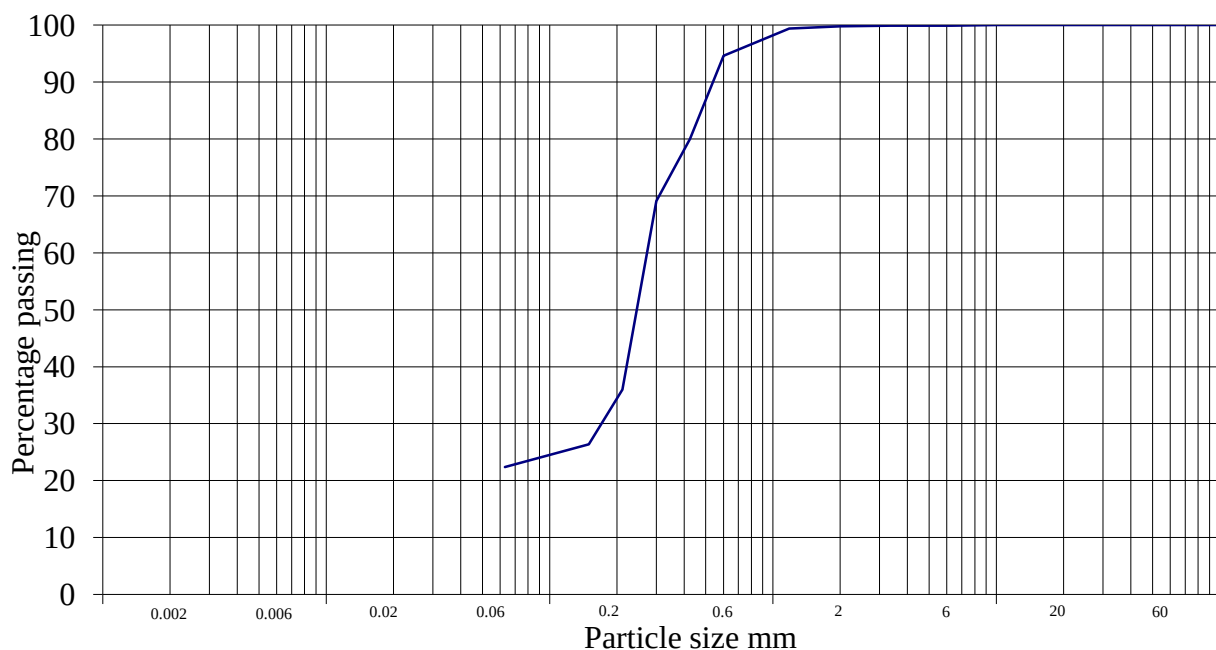
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Email: groundtech@listersgeotechnics.co.uk

**Quality
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		Test Method: BS 1377 : Part 2 : 1990 : 9.2			
		BS test sieve	Cumulative Passing - %	Hydrometer Particle Diameter	Cumulative Passing - %
Site: Lucas Lane, Hitchin, Hertfordshire SG5 2JA Test Location: BH 3 Sample Depth: 7.75m Sample Description: Hydrometer No.: SG Gs: Water Visc. (N): Dry Mass of Soil after pretreatment (g):		75mm	100.00		
		63mm	100.00		
		50mm	100.00		
		37.5mm	100.00		
		26.5mm	100.00		
		20mm	100.00		
		14mm	100.00		
		10mm	100.00		
		6.3mm	99.90		
		5mm	99.90		
		3.5mm	99.90		
		2mm	99.80		
		1.18mm	99.40		
		600µm	94.60		
		425µm	80.00		



CLAY	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	COBBLES
	SILT			SAND			GRAVEL			

PARTICLE SIZE DISTRIBUTION

Project Reference
16.07.021

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Geotechnical Testing Facility

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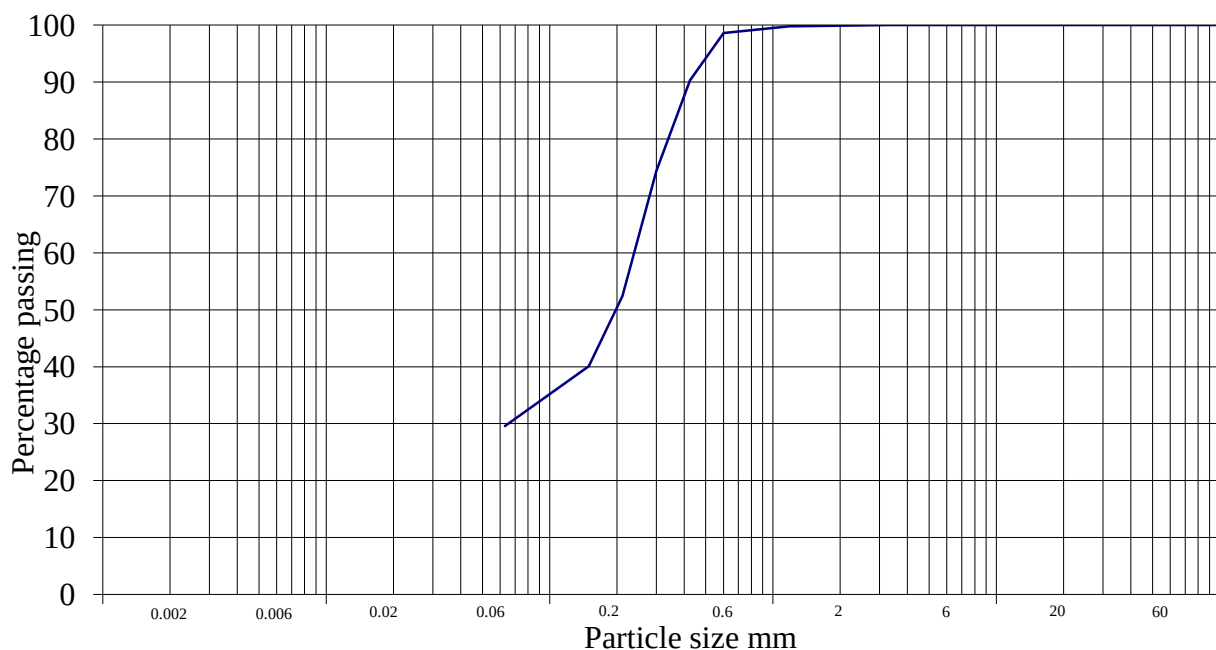
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Email: groundtech@listersgeotechnics.co.uk

**Quality
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ISO 9001**

		Test Method: BS 1377 : Part 2 : 1990 : 9.2			
		BS test sieve	Cumulative Passing - %	Hydrometer Particle Diameter	Cumulative Passing - %
Site: Lucas Lane, Hitchin, Hertfordshire SG5 2JA Test Location: BH 3 Sample Depth: 9.90m Sample Description: Hydrometer No.: SG Gs: Water Visc. (N): Dry Mass of Soil after pretreatment (g):		75mm	100.00		
		63mm	100.00		
		50mm	100.00		
		37.5mm	100.00		
		26.5mm	100.00		
		20mm	100.00		
		14mm	100.00		
		10mm	100.00		
		6.3mm	100.00		
		5mm	100.00		
		3.5mm	100.00		
		2mm	99.90		
		1.18mm	99.80		
		600µm	98.60		
		425µm	90.30		
		300µm	74.40		
		212µm	52.40		
		150µm	40.10		
		63µm	29.60		



CLAY	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	COBBLES
	SILT			SAND			GRAVEL			

PARTICLE SIZE DISTRIBUTION

Project Reference
16.07.021

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Geotechnical Testing Facility

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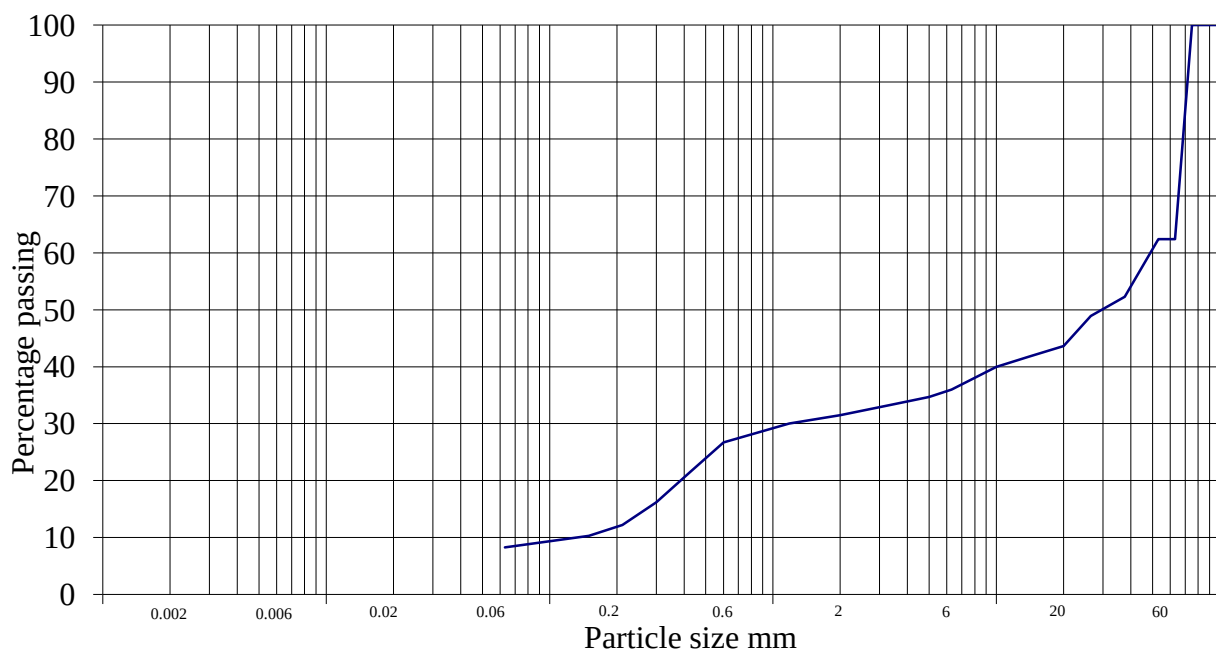
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Email: groundtech@listersgeotechnics.co.uk

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		Test Method: BS 1377 : Part 2 : 1990 : 9.2			
		BS test sieve	Cumulative Passing - %	Hydrometer Particle Diameter	Cumulative Passing - %
Site: Lucas Lane, Hitchin, Hertfordshire SG5 2JA	Test Location: TP 1 Sample Depth: 2.00m Sample Description:	75mm	100.00		
		63mm	62.40		
		50mm	62.40		
		37.5mm	52.30		
		26.5mm	48.90		
		20mm	43.60		
		14mm	41.80		
		10mm	40.00		
		6.3mm	36.00		
		5mm	34.70		
Hydrometer No.: SG Gs: Water Visc. (N): Dry Mass of Soil after pretreatment (g):		3.5mm	33.30		
		2mm	31.50		
		1.18mm	30.00		
		600µm	26.70		
		425µm	21.50		
		300µm	16.20		
		212µm	12.20		
		150µm	10.30		
		63µm	8.30		



CLAY	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	COBBLES
	SILT			SAND			GRAVEL			

PARTICLE SIZE DISTRIBUTION

Project Reference
16.07.021

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Geotechnical Testing Facility

Slapton Hill Barn, Blakesley Road, Slapton, Towcester, Northants. NN12 8QD

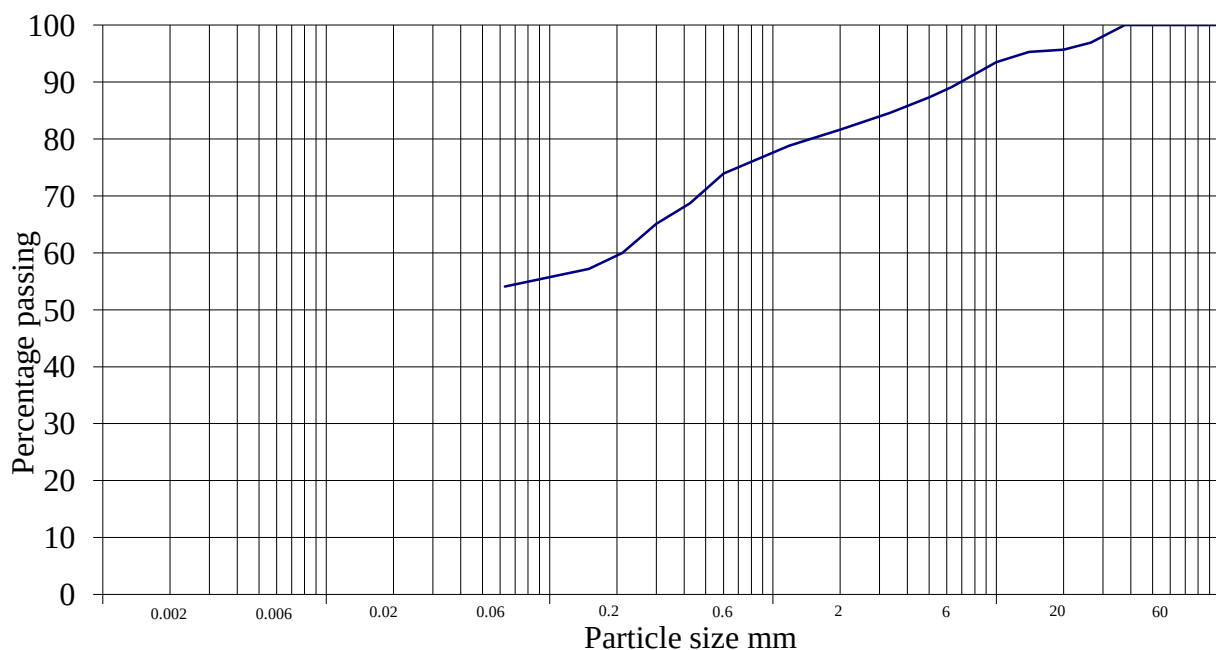
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**Quality
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ISO 9001**

		Test Method: BS 1377 : Part 2 : 1990 : 9.2			
		BS test sieve	Cumulative Passing - %	Hydrometer Particle Diameter	Cumulative Passing - %
Site: Lucas Lane, Hitchin, Hertfordshire SG5 2JA Test Location: TP 4 Sample Depth: 1.00m Sample Description: Hydrometer No.: SG Gs: Water Visc. (N): Dry Mass of Soil after pretreatment (g):		75mm	100.00		
		63mm	100.00		
		50mm	100.00		
		37.5mm	100.00		
		26.5mm	96.90		
		20mm	95.70		
		14mm	95.30		
		10mm	93.50		
		6.3mm	89.10		
		5mm	87.30		
		3.5mm	84.60		
		2mm	81.60		
		1.18mm	78.80		
		600µm	73.90		
		425µm	68.70		
		300µm	65.10		
		212µm	60.00		
		150µm	57.20		
		63µm	54.10		



CLAY	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	COBBLES
	SILT			SAND			GRAVEL			

PARTICLE SIZE DISTRIBUTION

Project Reference
16.07.021

GroundTech Laboratories

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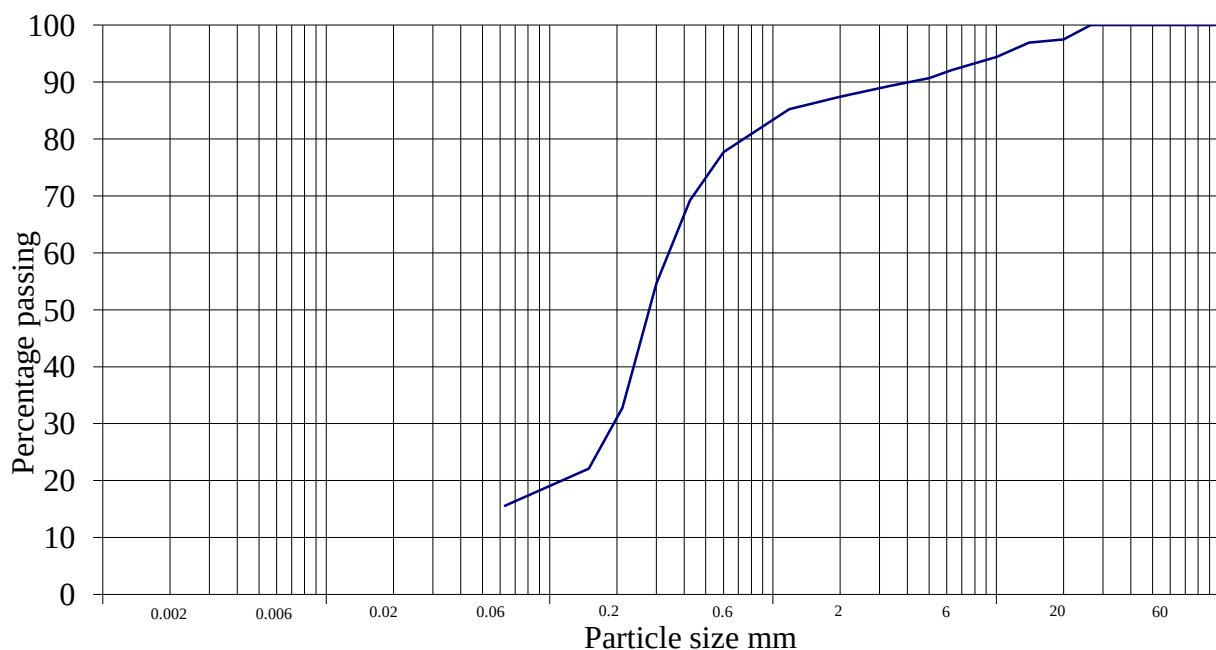
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		Test Method: BS 1377 : Part 2 : 1990 : 9.2			
		BS test sieve	Cumulative Passing - %	Hydrometer Particle Diameter	Cumulative Passing - %
Site: Lucas Lane, Hitchin, Hertfordshire SG5 2JA Test Location: TP 6 Sample Depth: 2.05m Sample Description: Hydrometer No.: SG Gs: Water Visc. (N): Dry Mass of Soil after pretreatment (g):		75mm	100.00		
		63mm	100.00		
		50mm	100.00		
		37.5mm	100.00		
		26.5mm	100.00		
		20mm	97.50		
		14mm	96.90		
		10mm	94.40		
		6.3mm	92.10		
		5mm	90.70		
		3.5mm	89.30		
		2mm	87.40		
		1.18mm	85.20		
		600µm	77.70		
		425µm	69.20		



CLAY	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	COBBLES
	SILT			SAND			GRAVEL			

PARTICLE SIZE DISTRIBUTION

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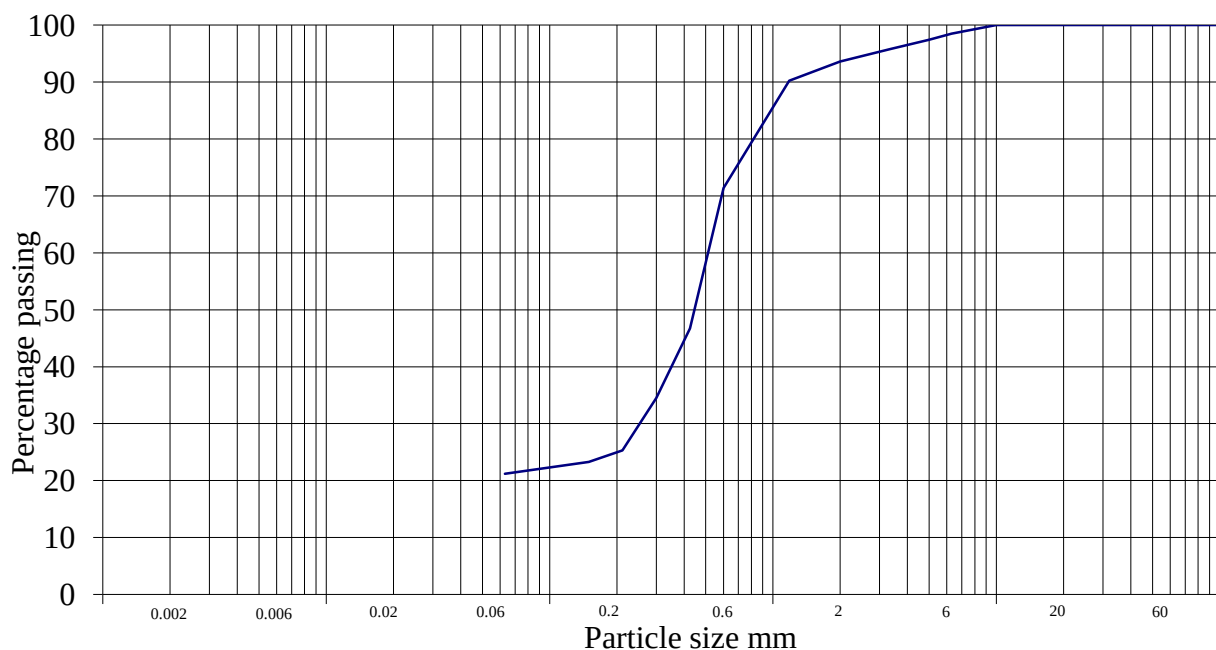
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**Quality
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ISO 9001**

		Test Method: BS 1377 : Part 2 : 1990 : 9.2			
		BS test sieve	Cumulative Passing - %	Hydrometer Particle Diameter	Cumulative Passing - %
Site: Lucas Lane, Hitchin, Hertfordshire SG5 2JA Test Location: TP 7 Sample Depth: 2.50m Sample Description: Hydrometer No.: SG Gs: Water Visc. (N): Dry Mass of Soil after pretreatment (g):		75mm	100.00		
		63mm	100.00		
		50mm	100.00		
		37.5mm	100.00		
		26.5mm	100.00		
		20mm	100.00		
		14mm	100.00		
		10mm	100.00		
		6.3mm	98.50		
		5mm	97.40		
		3.5mm	95.80		
		2mm	93.60		
		1.18mm	90.20		
		600µm	71.40		
		425µm	46.70		



CLAY	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	COBBLES
	SILT			SAND			GRAVEL			

PARTICLE SIZE DISTRIBUTION

Project Reference
16.07.021

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Geotechnical Testing Facility

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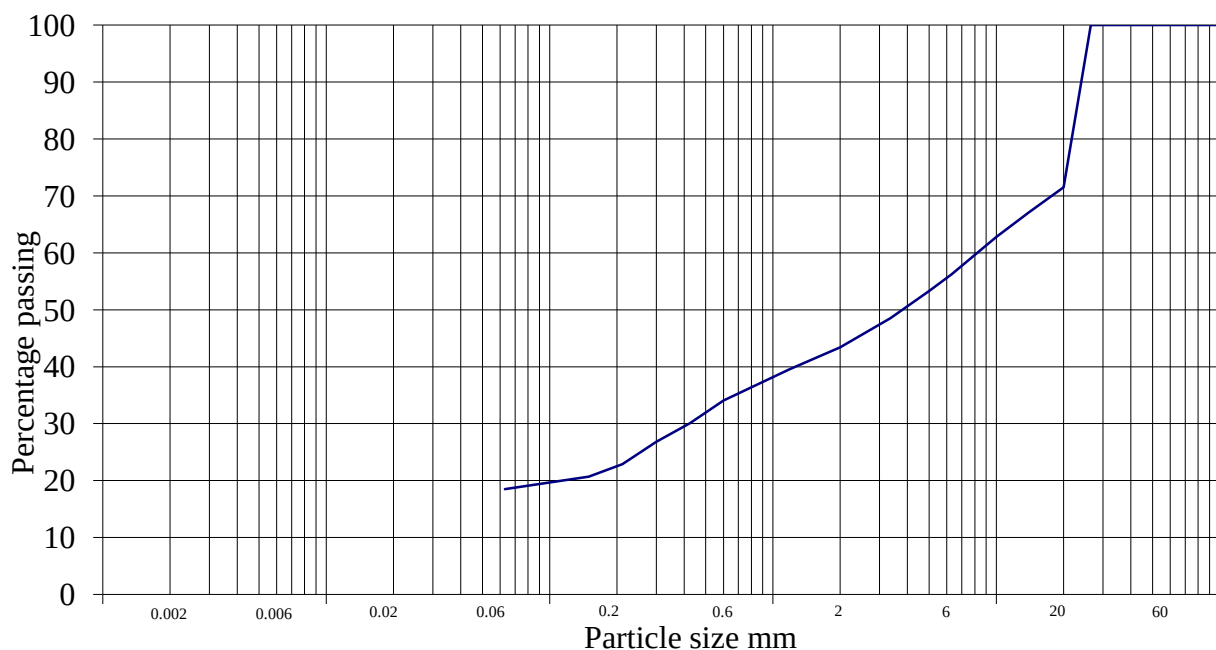
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**Quality
Assured
ISO 9001**

		Test Method: BS 1377 : Part 2 : 1990 : 9.2			
		BS test sieve	Cumulative Passing - %	Hydrometer Particle Diameter	Cumulative Passing - %
Site: Lucas Lane, Hitchin, Hertfordshire SG5 2JA Test Location: TP 8 Sample Depth: 0.60m Sample Description: Hydrometer No.: SG Gs: Water Visc. (N): Dry Mass of Soil after pretreatment (g):		75mm	100.00		
		63mm	100.00		
		50mm	100.00		
		37.5mm	100.00		
		26.5mm	100.00		
		20mm	71.50		
		14mm	67.10		
		10mm	62.80		
		6.3mm	56.20		
		5mm	53.30		
		3.5mm	48.50		
		2mm	43.40		
		1.18mm	39.50		
		600µm	34.10		
		425µm	30.10		



CLAY	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	COBBLES
	SILT			SAND			GRAVEL			

PARTICLE SIZE DISTRIBUTION

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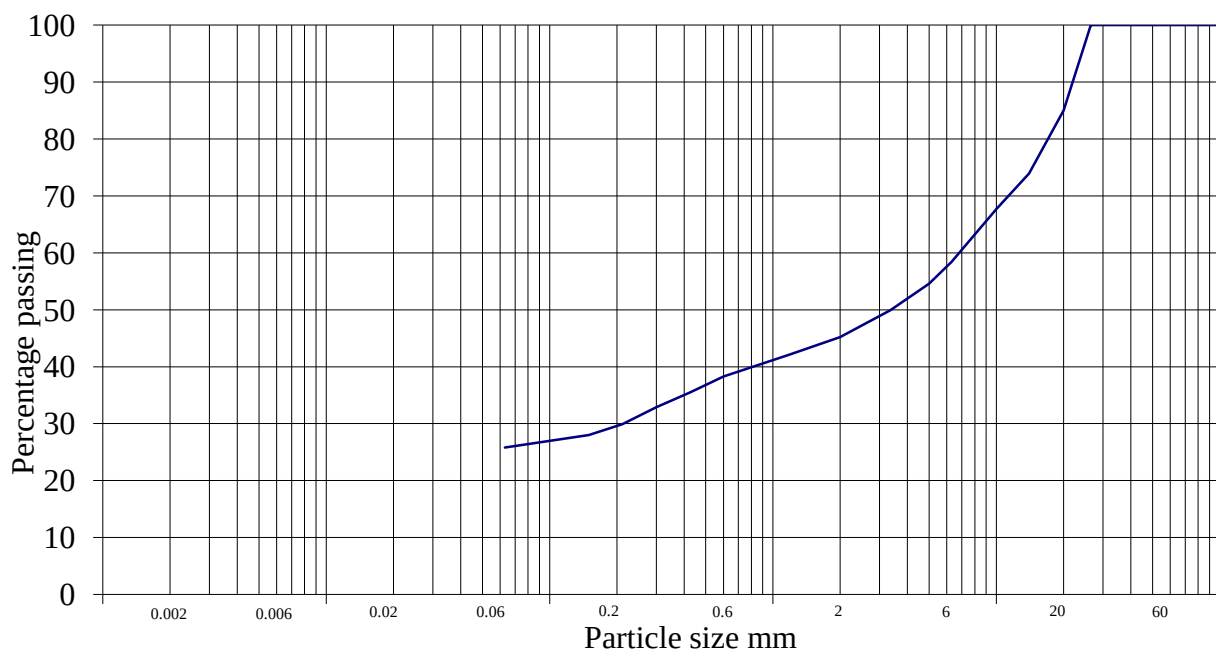
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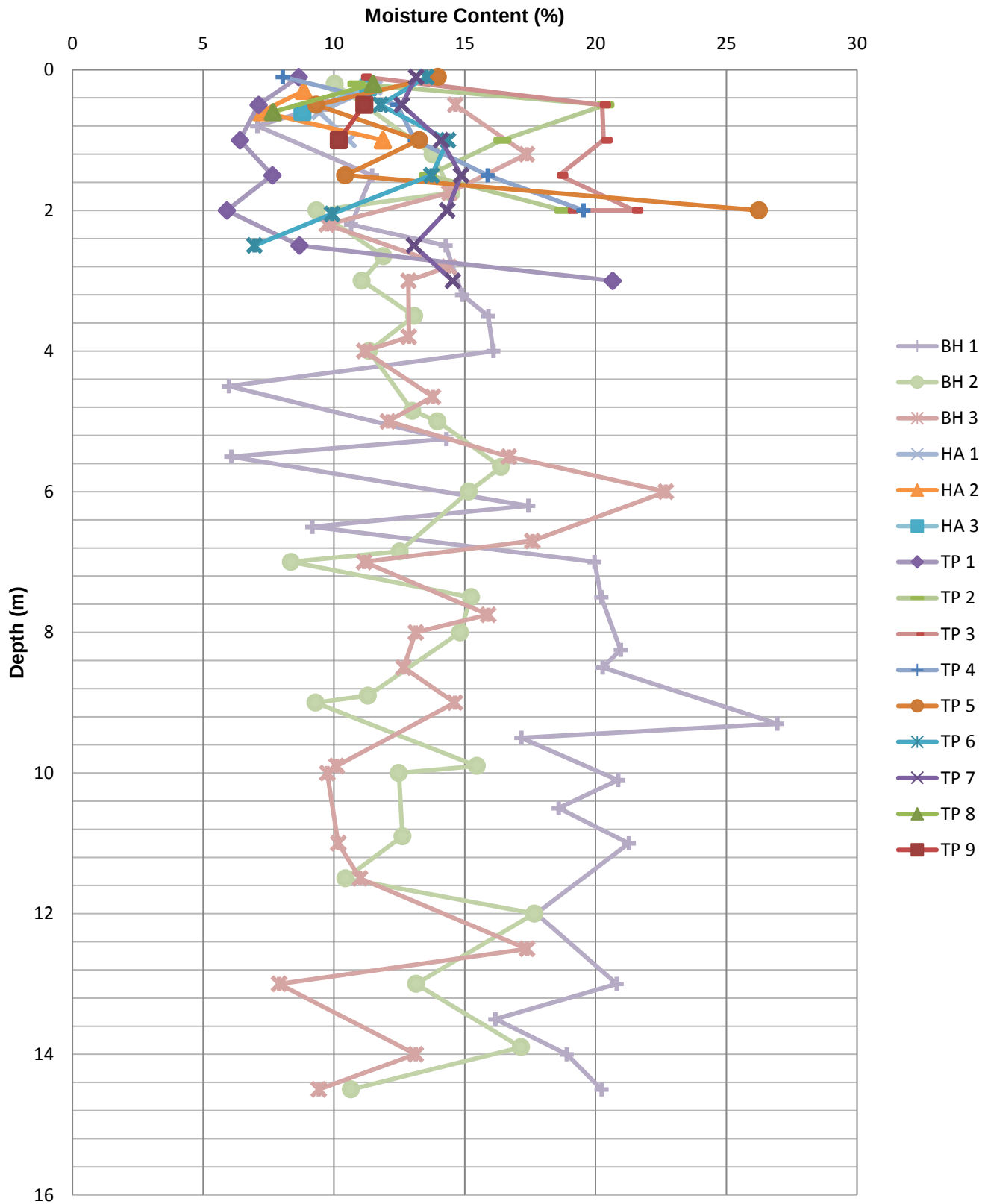
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		BS test sieve	Cumulative Passing - %	Hydrometer Particle Diameter	Cumulative Passing - %
Site: Lucas Lane, Hitchin, Hertfordshire SG5 2JA Test Location: TP 9 Sample Depth: 1.00m Sample Description: Hydrometer No.: SG Gs: Water Visc. (N): Dry Mass of Soil after pretreatment (g):		75mm	100.00		
		63mm	100.00		
		50mm	100.00		
		37.5mm	100.00		
		26.5mm	100.00		
		20mm	85.00		
		14mm	73.90		
		10mm	67.70		
		6.3mm	58.40		
		5mm	54.60		
		3.5mm	49.90		
		2mm	45.20		
		1.18mm	42.10		
		600µm	38.30		
		425µm	35.50		



CLAY	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	COBBLES
	SILT			SAND			GRAVEL			

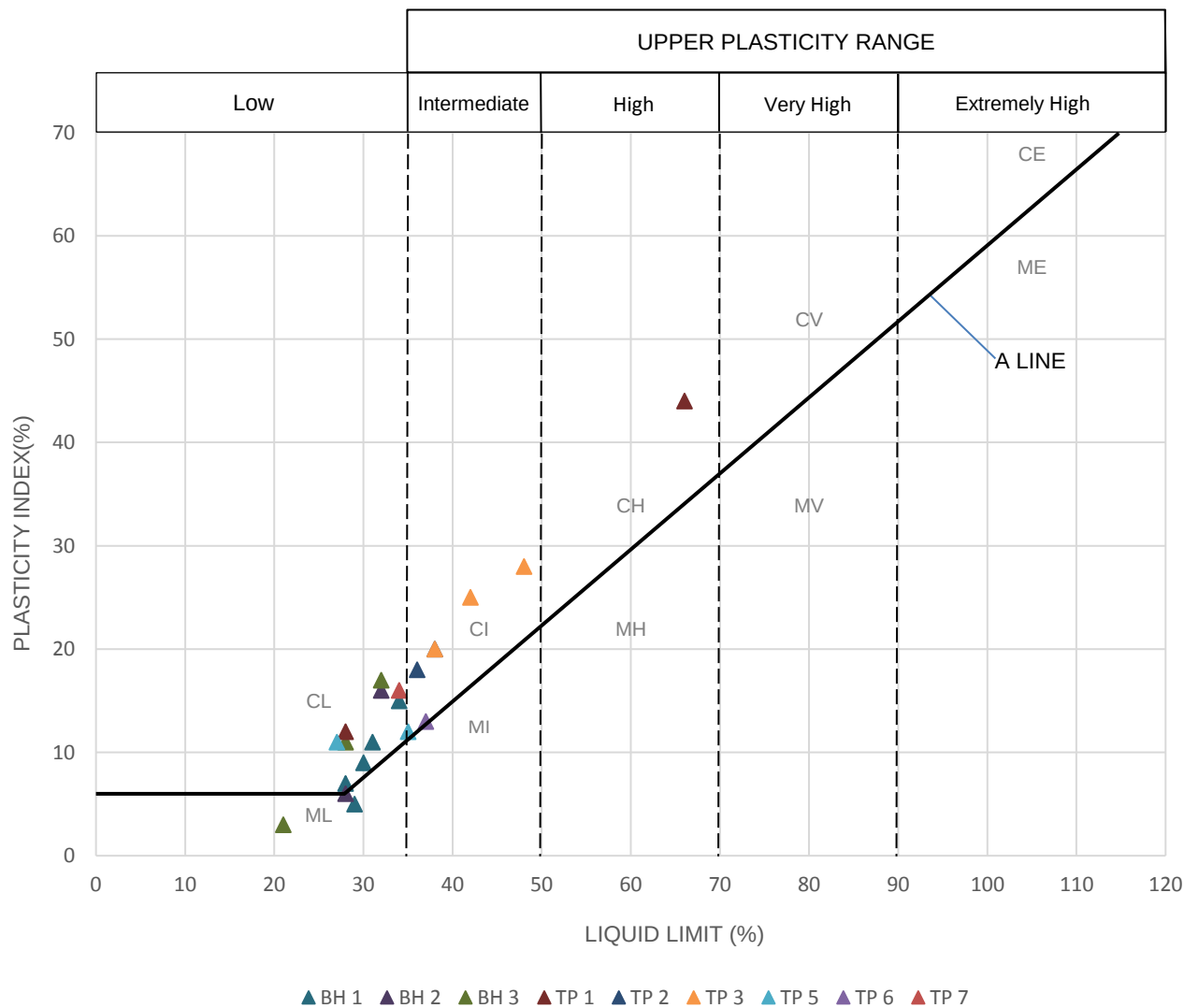
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16.07.021



MOISTURE CONTENT v DEPTH

Report:
16.07.021



PLASTICITY CHART

Report:
16.07.021



2183

Final Report

Report No.: 16-19271-1

Initial Date of Issue: 18-Aug-2016

Client Listers Geotechnical Consultants

Client Address: Slapton Hill Barn, Blakesley Road
Slapton
Towcester
Northamptonshire
NN12 8QD

Contact(s): Matthew Clarke

Project 16.07.021 Land at Lucas Lane, Hitchin,
Hertfordshire

Quotation No.: **Date Received:** 12-Aug-2016

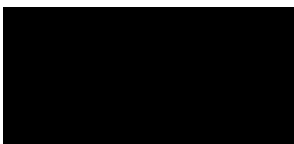
Order No.: 16.07.021/535 **Date Instructed:** 12-Aug-2016

No. of Samples: 10

Turnaround (Wkdays): 5 **Results Due:** 18-Aug-2016

Date Approved: 18-Aug-2016

Approved By:



Details: Robert Monk, Technical Development
Chemist

Results - Soil

Project: 16.07.021 Land at Lucas Lane, Hitchin, Hertfordshire

Client: Listers Geotechnical Consultants	Chemtest Job No.:				16-19271	16-19271	16-19271	16-19271	16-19271	16-19271	16-19271	16-19271	16-19271
Quotation No.:	Chemtest Sample ID.:				336451	336452	336453	336454	336455	336456	336457	336458	336459
	Client Sample ID.:				TP01	TP03	TP05	TP07	HA01	HA02	HA02	HA03	HA03
	Sample Type:				SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Top Depth (m):				0.10	0.10	0.50	0.10	0.60	0.60	1.00	0.25	0.60
	Date Sampled:				08-Aug-2016	08-Aug-2016	08-Aug-2016	08-Aug-2016	08-Aug-2016	08-Aug-2016	08-Aug-2016	08-Aug-2016	08-Aug-2016
	Asbestos Lab:				COVENTRY			COVENTRY	COVENTRY	COVENTRY			COVENTRY
Determinand	Accred.	SOP	Units	LOD									
ACM Type	U	2192		N/A	-			-	-	-			-
Asbestos Identification	U	2192	%	0.001	No Asbestos Detected			No Asbestos Detected	No Asbestos Detected	No Asbestos Detected			No Asbestos Detected
Moisture	N	2030	%	0.020	7.1	8.1	10	12	8.2	4.8	5.3	8.9	8.3
Stones	N	2030	%	0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020
pH	U	2010		N/A	8.2	7.7	8.0	7.2	7.7	8.1	8.0	7.2	7.7
Boron (Hot Water Soluble)	U	2120	mg/kg	0.40	1.0	0.72	0.68	1.1	3.5	2.1	2.5	2.7	2.4
Arsenic	U	2450	mg/kg	1.0	33	32	30	35	71	61	56	44	42
Cadmium	U	2450	mg/kg	0.10	0.33	0.32	0.31	0.42	0.74	4.6	0.59	0.38	0.35
Chromium	U	2450	mg/kg	1.0	20	19	21	22	24	30	22	24	25
Copper	U	2450	mg/kg	0.50	26	24	20	32	48	110	48	32	29
Mercury	U	2450	mg/kg	0.10	0.39	0.22	0.10	0.34	0.44	0.43	0.41	0.72	0.56
Nickel	U	2450	mg/kg	0.50	30	30	40	38	52	50	52	37	39
Lead	U	2450	mg/kg	0.50	90	78	29	97	510	330	240	150	110
Selenium	U	2450	mg/kg	0.20	0.25	0.21	< 0.20	0.33	0.56	0.48	0.35	0.50	0.30
Zinc	U	2450	mg/kg	0.50	110	86	110	130	340	250	210	180	140
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
TPH >C5-C6	N	2670	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH >C6-C7	N	2670	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH >C7-C8	N	2670	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH >C8-C10	N	2670	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH >C10-C12	N	2670	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	2.0	< 1.0	< 1.0	< 1.0
TPH >C12-C16	N	2670	mg/kg	1.0	< 1.0	3.4	< 1.0	3.8	5.8	10	3.3	< 1.0	< 1.0
TPH >C16-C21	N	2670	mg/kg	1.0	< 1.0	7.3	< 1.0	5.9	14	13	7.0	< 1.0	< 1.0
TPH >C21-C35	N	2670	mg/kg	1.0	< 1.0	37	< 1.0	26	61	39	30	< 1.0	< 1.0
Total TPH >C5-C35	N	2670	mg/kg	10	< 10	48	< 10	35	82	64	41	< 10	< 10
Naphthalene	U	2700	mg/kg	0.10	< 0.10	0.12	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthylene	U	2700	mg/kg	0.10	< 0.10	0.16	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthene	U	2700	mg/kg	0.10	< 0.10	0.34	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluorene	U	2700	mg/kg	0.10	< 0.10	0.48	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Phenanthrene	U	2700	mg/kg	0.10	0.36	5.7	0.40	< 0.10	0.96	0.77	0.50	< 0.10	< 0.10
Anthracene	U	2700	mg/kg	0.10	< 0.10	0.98	< 0.10	< 0.10	0.22	0.18	0.10	< 0.10	< 0.10
Fluoranthene	U	2700	mg/kg	0.10	0.49	5.3	0.38	0.62	2.0	2.3	1.3	< 0.10	< 0.10
Pyrene	U	2700	mg/kg	0.10	0.38	4.7	0.30	0.48	1.8	2.2	1.2	< 0.10	< 0.10
Benzo[a]anthracene	U	2700	mg/kg	0.10	< 0.10	2.1	< 0.10	< 0.10	0.88	1.2	0.51	< 0.10	< 0.10
Chrysene	U	2700	mg/kg	0.10	< 0.10	0.27	< 0.10	< 0.10	1.5	1.8	0.59	< 0.10	< 0.10
Benzo[b]fluoranthene	U	2700	mg/kg	0.10	< 0.10	2.6	< 0.10	< 0.10	1.3	2.0	0.97	< 0.10	< 0.10

Results - Soil

Project: 16.07.021 Land at Lucas Lane, Hitchin, Hertfordshire

Client: Listers Geotechnical Consultants	Chemtest Job No.:		16-19271	16-19271	16-19271	16-19271	16-19271	16-19271	16-19271	16-19271	16-19271	16-19271
Quotation No.:	Chemtest Sample ID.:		336451	336452	336453	336454	336455	336456	336457	336458	336459	
	Client Sample ID.:		TP01	TP03	TP05	TP07	HA01	HA02	HA02	HA03	HA03	
	Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	
	Top Depth (m):		0.10	0.10	0.50	0.10	0.60	0.60	1.00	0.25	0.60	
	Date Sampled:		08-Aug-2016	08-Aug-2016	08-Aug-2016	08-Aug-2016	08-Aug-2016	08-Aug-2016	08-Aug-2016	08-Aug-2016	08-Aug-2016	
	Asbestos Lab:		COVENTRY			COVENTRY	COVENTRY	COVENTRY			COVENTRY	
Determinand	Accred.	SOP	Units	LOD								
Benzo[k]fluoranthene	U	2700	mg/kg	0.10	< 0.10	1.0	< 0.10	< 0.10	0.60	0.88	0.40	< 0.10
Benzo[a]pyrene	U	2700	mg/kg	0.10	< 0.10	1.8	< 0.10	< 0.10	0.99	1.6	0.78	< 0.10
Indeno(1,2,3-c,d)Pyrene	U	2700	mg/kg	0.10	< 0.10	1.1	< 0.10	< 0.10	0.73	1.2	< 0.10	< 0.10
Dibenz(a,h)Anthracene	U	2700	mg/kg	0.10	< 0.10	0.40	< 0.10	< 0.10	0.17	0.21	< 0.10	< 0.10
Benzo[g,h,i]perylene	U	2700	mg/kg	0.10	< 0.10	0.87	< 0.10	< 0.10	0.83	1.5	0.62	< 0.10
Total Of 16 PAH's	U	2700	mg/kg	2.0	< 2.0	28	< 2.0	< 2.0	12	16	7.0	< 2.0

Project: 16.07.021 Land at Lucas Lane, Hitchin, Hertfordshire

Client: Listers Geotechnical Consultants	Chemtest Job No.:		16-19271		
Quotation No.:	Chemtest Sample ID.:		336468		
	Client Sample ID.:		TP08		
	Sample Type:		SOIL		
	Top Depth (m):		0.20		
	Date Sampled:		08-Aug-2016		
	Asbestos Lab:		COVENTRY		
Determinand	Accred.	SOP	Units	LOD	
ACM Type	U	2192		N/A	-
Asbestos Identification	U	2192	%	0.001	No Asbestos Detected
Moisture	N	2030	%	0.020	8.2
Stones	N	2030	%	0.020	< 0.020
pH	U	2010		N/A	7.7
Boron (Hot Water Soluble)	U	2120	mg/kg	0.40	2.9
Arsenic	U	2450	mg/kg	1.0	57
Cadmium	U	2450	mg/kg	0.10	0.97
Chromium	U	2450	mg/kg	1.0	31
Copper	U	2450	mg/kg	0.50	39
Mercury	U	2450	mg/kg	0.10	0.59
Nickel	U	2450	mg/kg	0.50	49
Lead	U	2450	mg/kg	0.50	320
Selenium	U	2450	mg/kg	0.20	0.48
Zinc	U	2450	mg/kg	0.50	460
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50
TPH >C5-C6	N	2670	mg/kg	1.0	< 1.0
TPH >C6-C7	N	2670	mg/kg	1.0	< 1.0
TPH >C7-C8	N	2670	mg/kg	1.0	< 1.0
TPH >C8-C10	N	2670	mg/kg	1.0	< 1.0
TPH >C10-C12	N	2670	mg/kg	1.0	< 1.0
TPH >C12-C16	N	2670	mg/kg	1.0	4.5
TPH >C16-C21	N	2670	mg/kg	1.0	11
TPH >C21-C35	N	2670	mg/kg	1.0	52
Total TPH >C5-C35	N	2670	mg/kg	10	67
Naphthalene	U	2700	mg/kg	0.10	0.26
Acenaphthylene	U	2700	mg/kg	0.10	0.13
Acenaphthene	U	2700	mg/kg	0.10	< 0.10
Fluorene	U	2700	mg/kg	0.10	0.13
Phenanthrene	U	2700	mg/kg	0.10	1.6
Anthracene	U	2700	mg/kg	0.10	0.15
Fluoranthene	U	2700	mg/kg	0.10	3.0
Pyrene	U	2700	mg/kg	0.10	3.0
Benzo[a]anthracene	U	2700	mg/kg	0.10	1.1
Chrysene	U	2700	mg/kg	0.10	1.8
Benzo[b]fluoranthene	U	2700	mg/kg	0.10	1.8

Project: 16.07.021 Land at Lucas Lane, Hitchin, Hertfordshire

Client: Listers Geotechnical Consultants	Chemtest Job No.:		16-19271		
Quotation No.:	Chemtest Sample ID.:		336468		
	Client Sample ID.:		TP08		
	Sample Type:		SOIL		
	Top Depth (m):		0.20		
	Date Sampled:		08-Aug-2016		
	Asbestos Lab:		COVENTRY		
Determinand	Accred.	SOP	Units	LOD	
Benzo[k]fluoranthene	U	2700	mg/kg	0.10	0.68
Benzo[a]pyrene	U	2700	mg/kg	0.10	1.3
Indeno(1,2,3-c,d)Pyrene	U	2700	mg/kg	0.10	0.84
Dibenz(a,h)Anthracene	U	2700	mg/kg	0.10	0.22
Benzo[g,h,i]perylene	U	2700	mg/kg	0.10	0.96
Total Of 16 PAH's	U	2700	mg/kg	2.0	17

Report Information

Key

- U UKAS accredited
- M MCERTS and UKAS accredited
- N Unaccredited
- S This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
- SN This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
- T This analysis has been subcontracted to an unaccredited laboratory
- I/S Insufficient Sample
- U/S Unsuitable Sample
- N/E not evaluated
- < "less than"
- > "greater than"

Comments or interpretations are beyond the scope of UKAS accreditation

The results relate only to the items tested

Uncertainty of measurement for the determinands tested are available upon request

None of the results in this report have been recovery corrected

All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis

All Asbestos testing is performed at our Coventry laboratory

Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

- A - Date of sampling not supplied
- B - Sample age exceeds stability time (sampling to extraction)
- C - Sample not received in appropriate containers
- D - Broken Container

Sample Retention and Disposal

All soil samples will be retained for a period of 45 days from the date of receipt

All water samples will be retained for 14 days from the date of receipt

Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:

customerservices@chemtest.co.uk

Listers Geo
Slapton Hill Barn, Blakesley Road
Slapton
Towcester
Northamptonshire
NN12 8QD

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

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

e: [REDACTED]

Analytical Report Number : 25-005949

Project / Site name: Lucas Lane, Hitchin, Hertfordshire, SG5 2HS

Your job number: 16 07 021C

Your order number: 16 07 021C 79

Report Issue Number: 1

Samples Analysed: 4 soil samples

Samples received on: 07/02/2025

**Samples instructed on/
Analysis started on:** 07/02/2025

Analysis completed by: 17/02/2025

Report issued on: 17/02/2025

Signed

[REDACTED]
Junior Reporting Specialist
For & on behalf of i2 Analytical Ltd.

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

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

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

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

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

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

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

Analytical Report Number: 25-005949
Project / Site name: Lucas Lane, Hitchin, Hertfordshire, SG5 2HS
Your Order No: 16 07 021C 79

Lab Sample Number				447581	447582	447583	447584
Sample Reference				HDP01	HDP02	HDP03	HDP04
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied
Water Matrix				N/A	N/A	N/A	N/A
Depth (m)				0.20	0.20	0.40	0.40
Date Sampled				Deviating	Deviating	Deviating	Deviating
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Test Limit of detection	Test Accreditation Status				

Stone Content	%	0.1	NONE	24.9	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	19	20	12	13
Total mass of sample received	kg	0.1	NONE	0.6	0.7	0.6	0.8

Asbestos

Asbestos in Soil Detected/Not Detected	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	KJK	KJK	KJK	KJK

General Inorganics

pH (L005B)	pH Units	N/A	MCERTS	7.5	7.2	7.6	7.7
Water Soluble Sulphate as SO ₄ 16hr extraction (2:1)	mg/kg	2.5	MCERTS	47	58	33	28
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	23.6	28.8	16.7	14
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	-	3.7	-	1.3

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	2	1.9	1.9	1.6
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	0.14	0.16	0.08	< 0.05
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	0.46	0.4	0.18	0.08
Pyrene	mg/kg	0.05	MCERTS	0.39	0.35	0.14	0.07
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.24	0.23	0.09	< 0.05
Chrysene	mg/kg	0.05	MCERTS	0.31	0.24	0.12	0.07
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	0.45	0.32	0.13	0.07
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	0.14	0.14	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.35	0.29	0.11	0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.17	0.14	0.06	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.19	0.15	0.05	< 0.05

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	4.85	4.34	2.87	1.9
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Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	35	34	55	58
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	25	27	29	35
Copper (aqua regia extractable)	mg/kg	1	MCERTS	42	43	36	40
Lead (aqua regia extractable)	mg/kg	1	MCERTS	120	140	80	80
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	0.7	0.7	0.4	0.4
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	34	35	44	48
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	200	310	280	320



Analytical Report Number: 25-005949
Project / Site name: Lucas Lane, Hitchin, Hertfordshire, SG5 2HS
Your Order No: 16 07 021C 79

Lab Sample Number				447581	447582	447583	447584
Sample Reference				HDP01	HDP02	HDP03	HDP04
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied
Water Matrix				N/A	N/A	N/A	N/A
Depth (m)				0.20	0.20	0.40	0.40
Date Sampled				Deviating	Deviating	Deviating	Deviating
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Test Limit of detection	Test Accreditation Status				

Petroleum Hydrocarbons

TPH (>EC10 - EC12) EH_CU_1D_TOTAL	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0
TPH (>EC12 - EC16) EH_CU_1D_TOTAL	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0
TPH (>EC16 - EC21) EH_CU_1D_TOTAL	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10
TPH (>EC21 - EC40) EH_CU_1D_TOTAL	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10

TPH (EC10 - EC40) EH_CU_1D_TOTAL	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10
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U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected



Analytical Report Number : 25-005949
Project / Site name: Lucas Lane, Hitchin, Hertfordshire, SG5 2HS

* 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 *
447581	HDP01	None Supplied	0.2	Brown loam and sand with vegetation and stones
447582	HDP02	None Supplied	0.2	Brown loam and sand with gravel and vegetation
447583	HDP03	None Supplied	0.4	Brown loam and clay with gravel and vegetation
447584	HDP04	None Supplied	0.4	Brown loam and clay with gravel and vegetation

Analytical Report Number : 25-005949

Project / Site name: Lucas Lane, Hitchin, Hertfordshire, SG5 2HS

Water matrix abbreviations:

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

Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in Soil	Asbestos Identification with the use of polarised light microscopy in conjunction with dispersion staining techniques	In-house method based on HSG 248, 2021	A001B	D	ISO 17025
pH at 20°C in soil	Determination of pH in soil by addition of water followed by electrometric measurement	In-house method	L005B	W	MCERTS
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate (Walkley Black Method)	In-house method	L009B	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically (up to 30°C)	In-house method	L019B	W	NONE
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight	In-house method based on British Standard Methods and MCERTS requirements.	L019B	D	NONE
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil	L038B	D	MCERTS
Sulphate, water soluble, in soil (16hr extraction)	Sulphate, water soluble, in soil (16hr extraction)	In-house method	L038B	D	MCERTS
Speciated PAHs and/or Semi-volatile organic compounds in soil	Determination of semi-volatile organic compounds (including PAH) in soil by extraction in dichloromethane and hexane followed by GC-MS	In-house method based on USEPA 8270	L064B	D	MCERTS
TPH Chromatogram in soil	TPH Chromatogram in soil	In-house method	L064B	D	NONE
Total petroleum hydrocarbons by GC-FID/GC-MS HS in soil	Determination of total petroleum hydrocarbons in soil by GC-FID/GC-MS HS	In-house method	L076B/L088-PL	D/W	MCERTS

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

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

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

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

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

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

The result for sum should be interpreted with caution

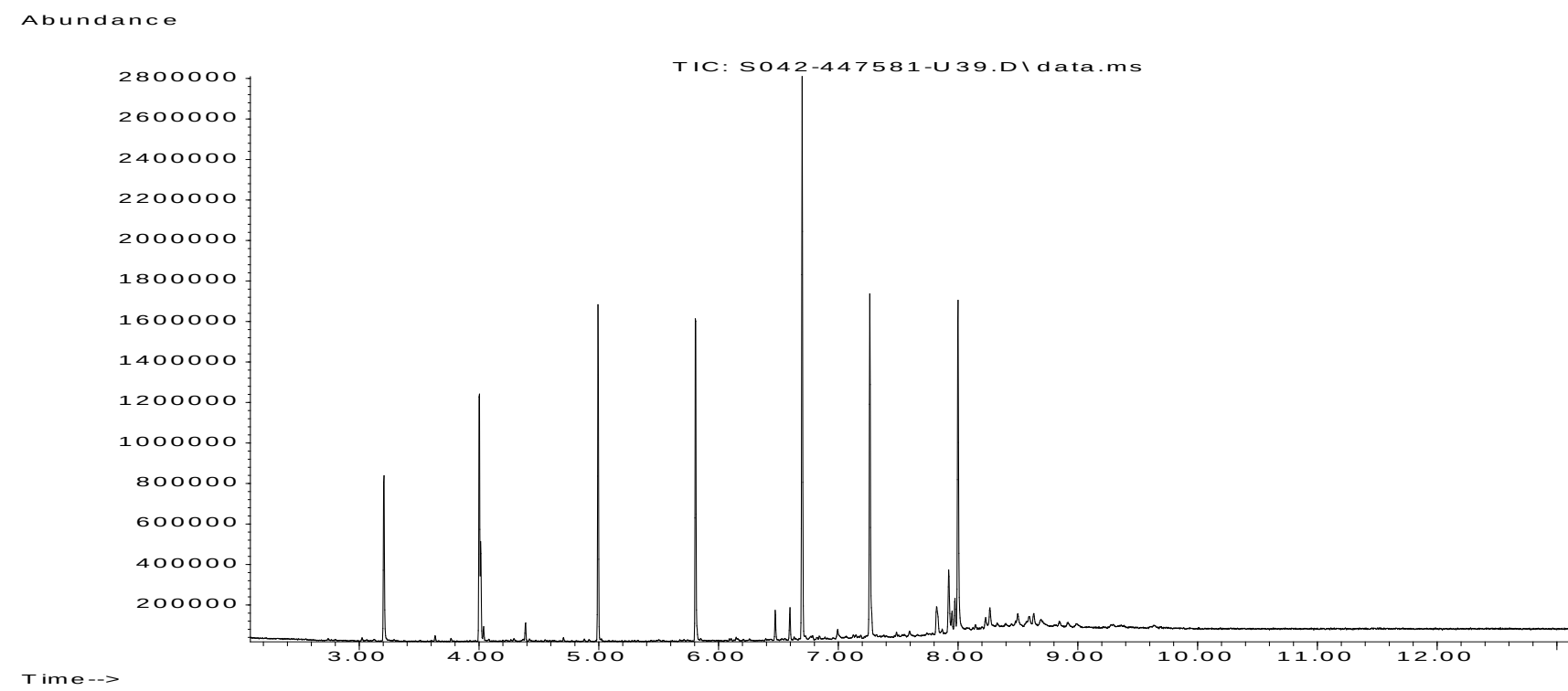
Analytical Report Number : 25-005949

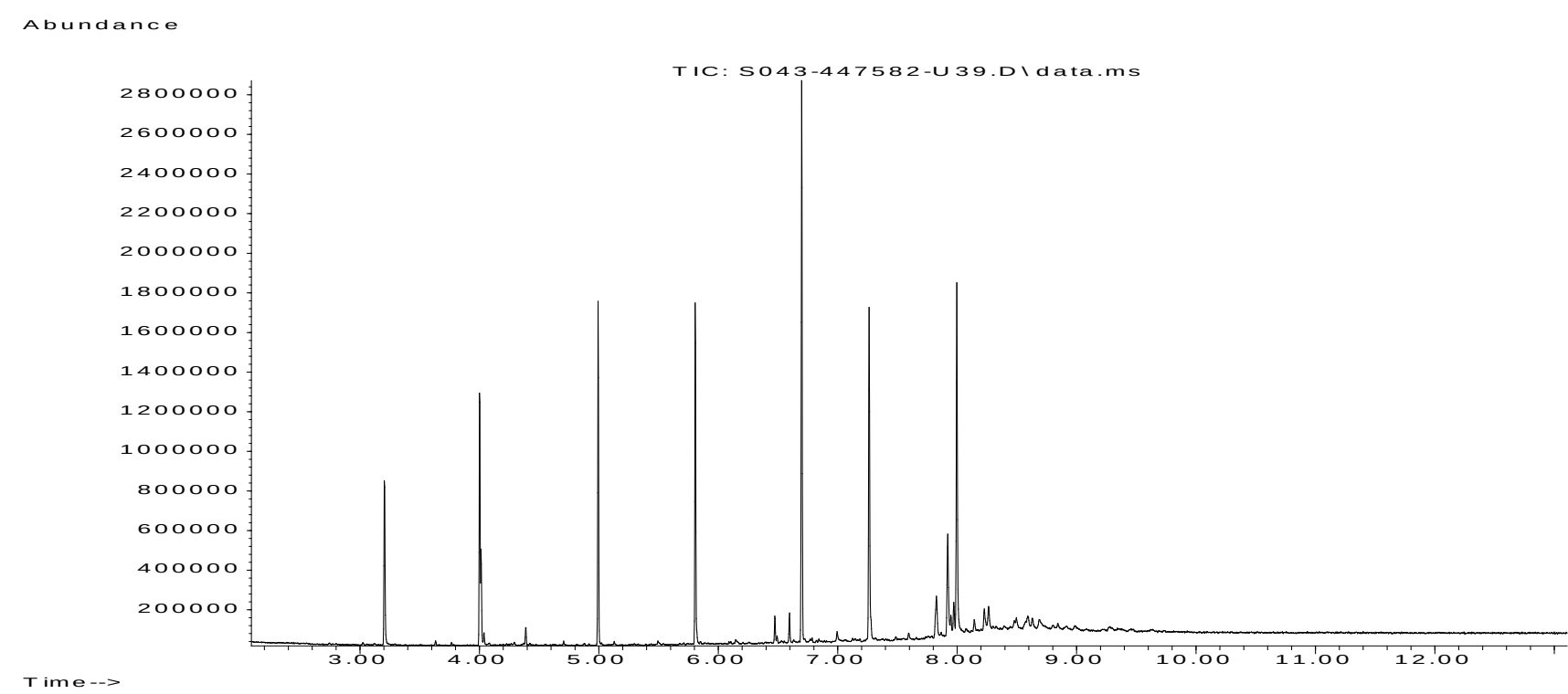
Project / Site name: Lucas Lane, Hitchin, Hertfordshire, SG5 2HS

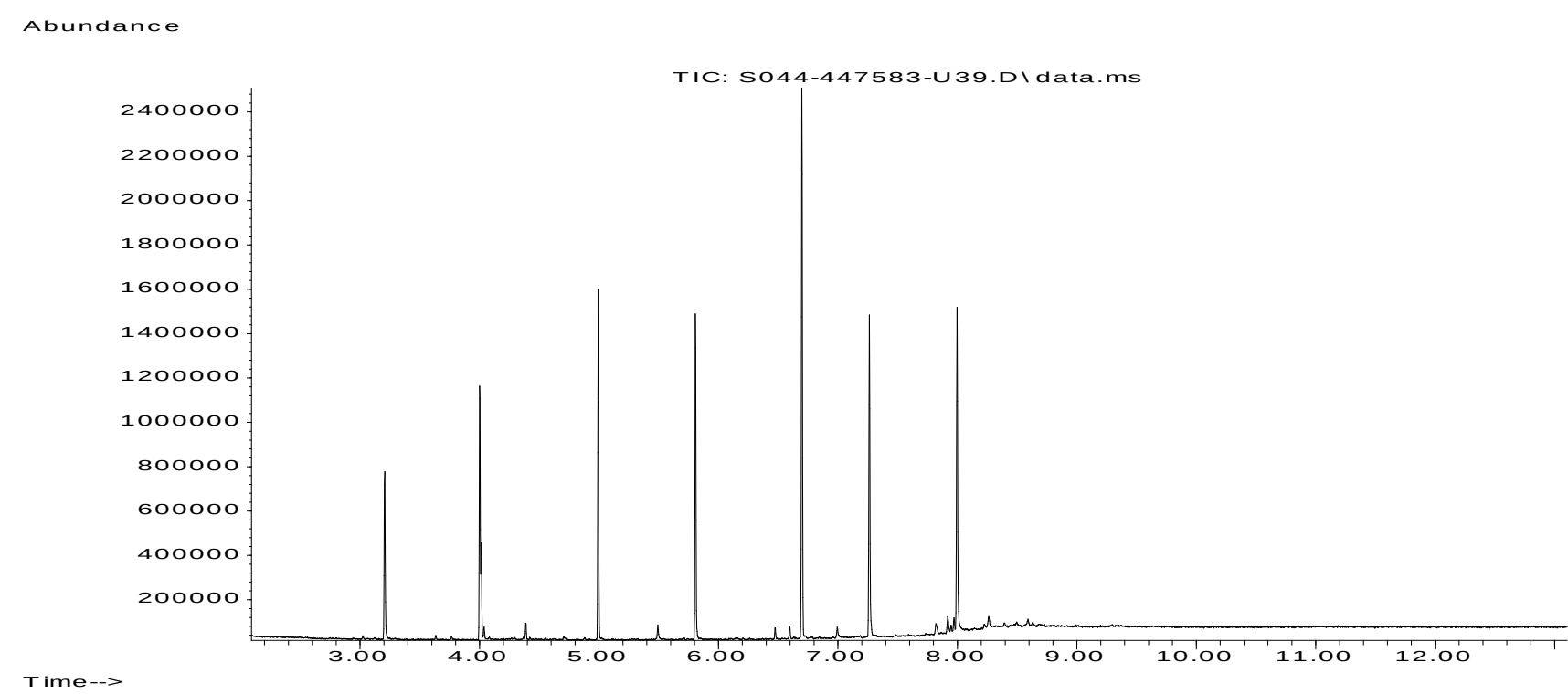
This deviation report indicates the sample and test deviations that apply to the samples submitted for analysis. Please note that the associated result(s) may be unreliable and should be interpreted with care.

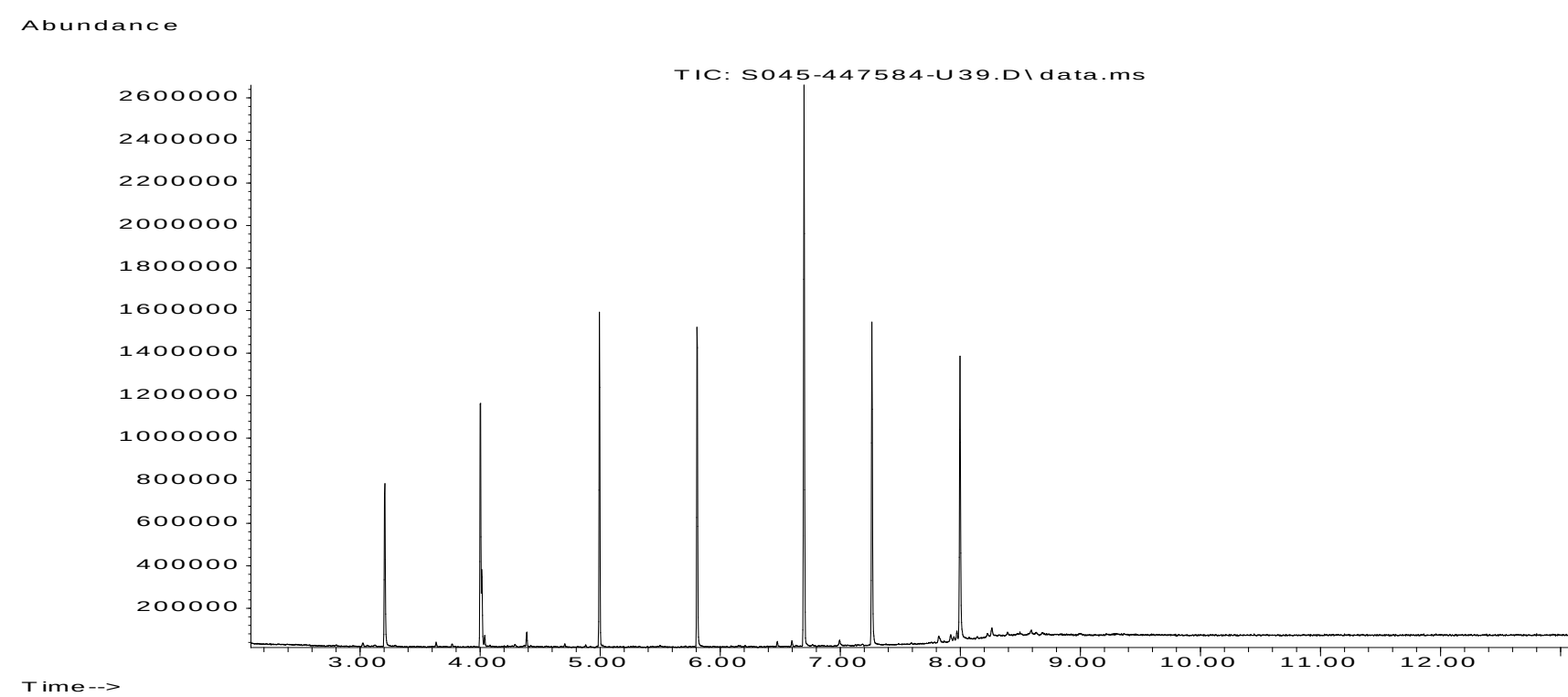
Key: a - No sampling date b - Incorrect container c - Holding time d - Headspace e - Temperature

Sample ID	Other ID	Sample Type	Lab Sample Number	Sample Deviation	Test Name	Test Ref	Test Deviation
HDP01	N/A	S	447581	a	Asbestos identification in Soil	A001B	a
HDP01	N/A	S	447581	a	Asbestos types if id positive	N/A	a
HDP01	N/A	S	447581	a	Metals in soil by ICP-OES	L038B	a
HDP01	N/A	S	447581	a	Moisture Content	L019B	a
HDP01	N/A	S	447581	a	Sample preparation	L019B	a
HDP01	N/A	S	447581	a	Soil Descriptions	L019B	a
HDP01	N/A	S	447581	a	Speciated PAHs and/or Semi-volatile organic compounds in soil	L064B	a
HDP01	N/A	S	447581	a	Stones content of soil	L019B	a
HDP01	N/A	S	447581	a	Sulphate, water soluble, in soil (16hr extraction)	L038B	a
HDP01	N/A	S	447581	a	TPH Chromatogram in soil	L064B	a
HDP01	N/A	S	447581	a	Total petroleum hydrocarbons by GC-FID/GC-MS HS in soil	L076B/L088-PL	a
HDP01	N/A	S	447581	a	pH at 20°C in soil	L005B	a
HDP02	N/A	S	447582	a	Asbestos identification in Soil	A001B	a
HDP02	N/A	S	447582	a	Asbestos types if id positive	N/A	a
HDP02	N/A	S	447582	a	Metals in soil by ICP-OES	L038B	a
HDP02	N/A	S	447582	a	Moisture Content	L019B	a
HDP02	N/A	S	447582	a	Sample preparation	L019B	a
HDP02	N/A	S	447582	a	Soil Descriptions	L019B	a
HDP02	N/A	S	447582	a	Speciated PAHs and/or Semi-volatile organic compounds in soil	L064B	a
HDP02	N/A	S	447582	a	Stones content of soil	L019B	a
HDP02	N/A	S	447582	a	Sulphate, water soluble, in soil (16hr extraction)	L038B	a
HDP02	N/A	S	447582	a	TPH Chromatogram in soil	L064B	a
HDP02	N/A	S	447582	a	Total organic carbon (Automated) in soil	L009B	a
HDP02	N/A	S	447582	a	Total petroleum hydrocarbons by GC-FID/GC-MS HS in soil	L076B/L088-PL	a
HDP02	N/A	S	447582	a	pH at 20°C in soil	L005B	a
HDP03	N/A	S	447583	a	Asbestos identification in Soil	A001B	a
HDP03	N/A	S	447583	a	Asbestos types if id positive	N/A	a
HDP03	N/A	S	447583	a	Metals in soil by ICP-OES	L038B	a
HDP03	N/A	S	447583	a	Moisture Content	L019B	a
HDP03	N/A	S	447583	a	Sample preparation	L019B	a
HDP03	N/A	S	447583	a	Soil Descriptions	L019B	a
HDP03	N/A	S	447583	a	Speciated PAHs and/or Semi-volatile organic compounds in soil	L064B	a
HDP03	N/A	S	447583	a	Stones content of soil	L019B	a
HDP03	N/A	S	447583	a	Sulphate, water soluble, in soil (16hr extraction)	L038B	a
HDP03	N/A	S	447583	a	TPH Chromatogram in soil	L064B	a
HDP03	N/A	S	447583	a	Total petroleum hydrocarbons by GC-FID/GC-MS HS in soil	L076B/L088-PL	a
HDP03	N/A	S	447583	a	pH at 20°C in soil	L005B	a
HDP04	N/A	S	447584	a	Asbestos identification in Soil	A001B	a
HDP04	N/A	S	447584	a	Asbestos types if id positive	N/A	a
HDP04	N/A	S	447584	a	Metals in soil by ICP-OES	L038B	a
HDP04	N/A	S	447584	a	Moisture Content	L019B	a
HDP04	N/A	S	447584	a	Sample preparation	L019B	a
HDP04	N/A	S	447584	a	Soil Descriptions	L019B	a
HDP04	N/A	S	447584	a	Speciated PAHs and/or Semi-volatile organic compounds in soil	L064B	a
HDP04	N/A	S	447584	a	Stones content of soil	L019B	a
HDP04	N/A	S	447584	a	Sulphate, water soluble, in soil (16hr extraction)	L038B	a
HDP04	N/A	S	447584	a	TPH Chromatogram in soil	L064B	a
HDP04	N/A	S	447584	a	Total organic carbon (Automated) in soil	L009B	a
HDP04	N/A	S	447584	a	Total petroleum hydrocarbons by GC-FID/GC-MS HS in soil	L076B/L088-PL	a
HDP04	N/A	S	447584	a	pH at 20°C in soil	L005B	a









APPENDIX D

CONTAMINATION RISK ASSESSMENT

Contaminated Land Risk Assessment – Definition of Methodology

The Contaminated Land Risk Assessment methodology followed in this report is based on Environment Agency's (EA) online guidance, Land Contamination: Risk Management (LCRM), published in June 2019. The new guidance is based upon the principles of the EA's CLR11 guidance, Model procedures for the management of land contamination, published in 2004.

The preliminary Conceptual Site Model (CSM) has been assessed using the methodology set out in CIRIA C552, Contaminated Land Risk Assessment - A Guide to Good Practice, published in 2001, as detailed below.

Risk evaluation determines the magnitude of risks present by assessing the likelihood of a particular risk being present alongside the severity of the consequence, should that event occur. The overall risk classification is a combination of the two and provides a qualitative assessment upon which to base any further work or remedial measures, where deemed necessary.

Where complete pollutant linkages are present, the probability of a contamination risk occurring at the site has been classified in accordance with the terms listed and defined in the table below.

Classification	Definition of Probability
High Likelihood	An event appears very likely in the short term and almost inevitable in the long term; or there is evidence at the receptor that harm or pollution is occurring.
Likely	It is probable that an event will occur, however, the event is not inevitable. It is possible in the short term and is likely over the long term.
Low Likelihood	Circumstances are possible under which an event could occur. However, it is uncertain that the event would occur even over a longer period and even less likely in the short term.
Unlikely	Circumstances are such that it is improbable that an event would occur even in the very long term.

The magnitude of the consequence of a contamination event occurring at this site is classified in accordance with the definitions listed in the following table. The classification of the consequence does not take into account the probability of the consequences being realised.

Classification	Definition of Consequence	Examples
Severe	Short term (acute) risk to human health likely to result in “significant harm” as defined by the Environment protection Act (1990), Part IIA. Short term risk of pollution of controlled waters. Catastrophic damage to buildings/property. A short-term risk to a particular ecosystem, or organism forming part of such ecosystem	High concentrations of cyanide on the surface of an informal recreation area. Major spillage of contaminants from site into controlled water. Explosion causing building collapse (can also equate to a short-term human health risk if buildings are occupied.).
Medium	Chronic damage to Human Health (“significant harm”). Pollution of controlled waters. A significant change in a particular ecosystem, or organism forming part of such ecosystem.	Concentrations of contaminants from site exceeding generic or site-specific screening criteria. Leaching of contaminants into a major or minor aquifer. Death of species within a designated nature reserve.
Mild	Pollution of non-sensitive water resources. Significant damage to crops, buildings, structures and services. Damage to sensitive buildings/structures/services or the environment	Pollution of non-classified groundwater. Damage to building rendering it unsafe to occupy. (e.g. foundation damage resulting in instability).
Minor	Harm, although not necessarily significant harm, which may result in a financial loss, or expenditure to resolve. Non-permanent health effects to human health (easily prevented by measures such as protective clothing etc). Easily reparable effects of damage to buildings, structures and services	The presence of contaminants at such concentration that protective equipment is required during site works. The loss of plants in a landscaping scheme. Discolouration of concrete.

Once the probability and consequence of each pathway has been classified, the potential overall risk classification can be evaluated using the following matrix.

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

The definitions of the risk categories provided in CIRIA C552, together with actions that are likely to be necessary, are presented below.

Classification	Definition of Risk and Likely Actions Required
Very high Risk	• High probability that severe harm could arise or that severe harm is already occurring • This risk, if realised, is likely to result in a substantial liability • Urgent investigation and remediation are likely to be required
High Risk	• Harm is likely to arise • The risk, if realised, is likely to present a substantial liability • Urgent investigation is required and remediation may be necessary in the short term and likely over the longer term
Moderate Risk	• It is possible that harm could arise, however, it is unlikely that any harm would be severe and more likely it would be relatively mild • Investigation is likely to be required to clarify the risk and determine potential liability • Some remediation may be required in the longer term
Low Risk	• It is possible that harm could arise, but is likely that this harm, if realised, would be mild at worst
Very low Risk	• There is a low possibility that harm could arise • If realised, such harm is not likely to be severe

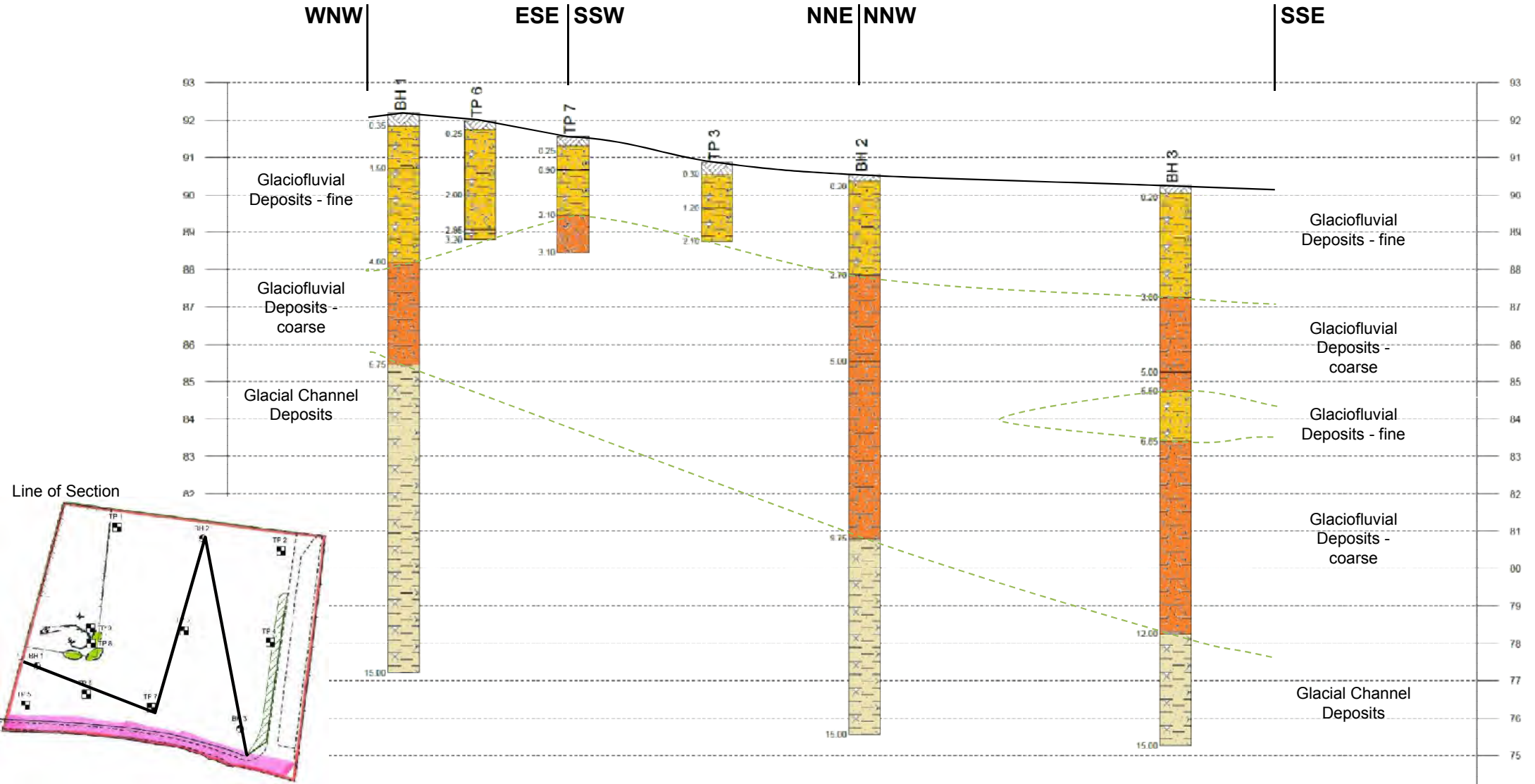
Reference:

Rudland, D J, Lancefield, R M, Mayell, P N, Contaminated land Risk Assessment. A guide to Good Practice, CIRIA Report C552, 2001.

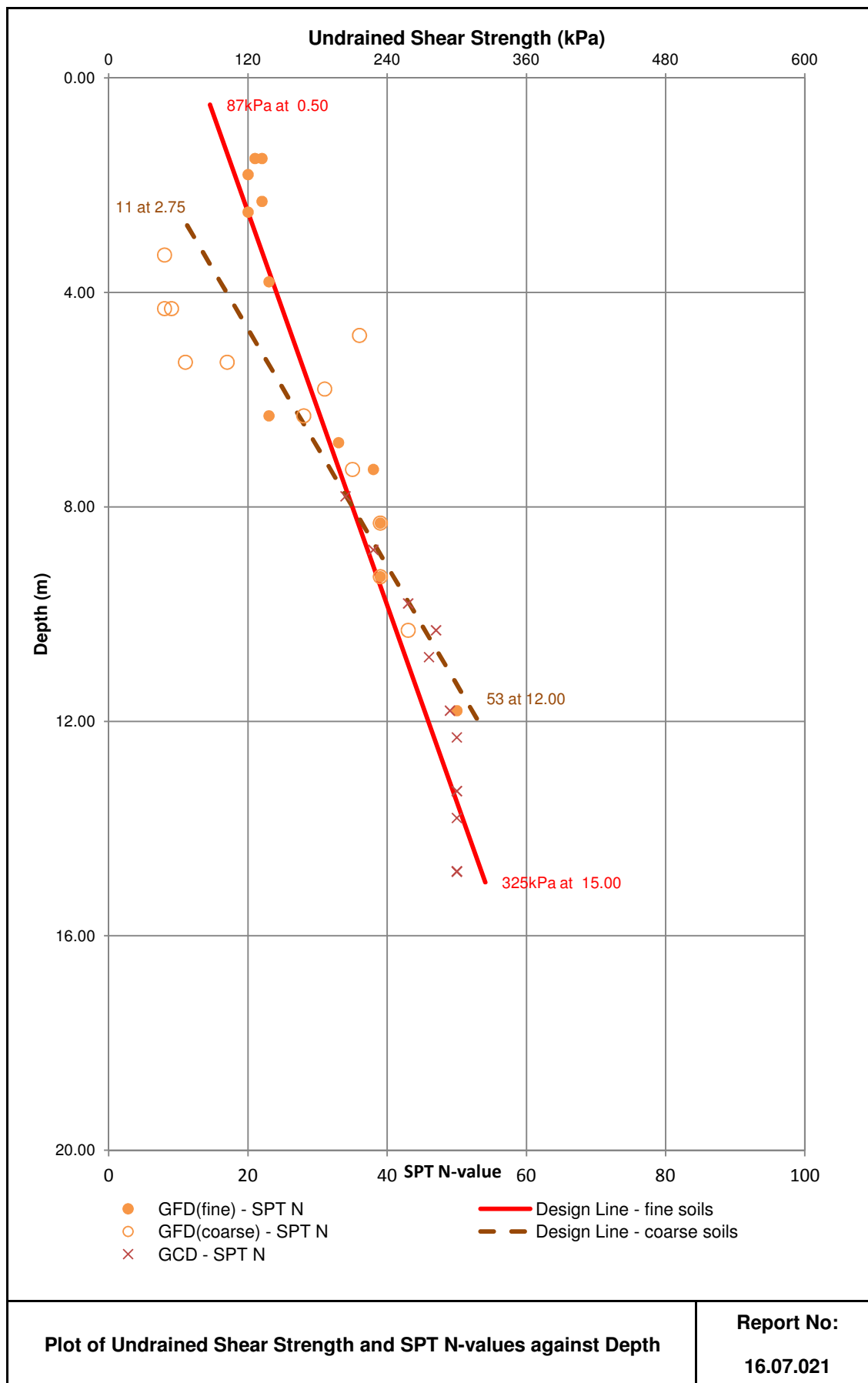
APPENDIX E

GEOTECHNICAL PLOTS AND TABLES

Geological Cross-Section



Chainage (m)	0.00	7.98	24.99	46.34	77.87	119.33	180.30
Offset (m)		0.71	4.16	0.22	1.74	0.17	0.06
Elevation (mAOD)		92.20	92.00	91.85	90.85	90.55	90.25



The working load of a single pile is the sum of the ultimate shaft resistance and the ultimate end bearing resistance, each divided by an appropriate factor of safety. The following unit ultimate values of shaft resistance and end bearing resistance are proposed for preliminary pile design:

Ultimate Skin Friction

kN

Glaciofluvial Deposits (fine)

Ranges from GL to between 2.0m and 4.0m bgl

$As \times (39 + 8.2z)$

Glaciofluvial Deposits (coarse)

Ranges from between 2.0m and 4.0m bgl
to between 6.75m and 12.00m bgl

$As \times 10$
(conservative values based on
assumption of disturbance)

Glacial Channel Deposits

Top varies as base of GFD, above, down to >15m bgl

$As \times (39 + 8.2z)$

Ultimate End Bearing

kN

Glaciofluvial Deposits (coarse)

Ranges from between 2.0m and 4.0m bgl
to between 6.75m and 12.00m bgl

$Ab \times (710 + 148z)$
(conservative values based on
assumption of fine soils beneath)

Glacial Channel Deposits

Top varies as base of GFD, above, down to >15m bgl

$Ab \times (710 + 148z)$

Notes:

Assumes the use of bored piles

z = depth (m)

As = area of the pile shaft (m²)

Ab = area of pile base (m²)

For fine soils: 'Adhesion' factor, α , of 0.5 and Bearing Capacity Factor, N_c , of 9 have been used

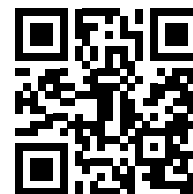
For coarse soils: conservative parameters adopted - based on the assumption of disturbance during placement and the Coefficient of Horizontal Effective Stress taken as 0.3

PILE DESIGN DATA

Report No: 16.07.021

APPENDIX F WASTE CLASSIFICATION

Waste Classification Report



MGSYK-47JJ9-NZ8MZ

Job name

16.07.021 - Hitchin

Waste Stream

Chemtest Friendly (AD compliant)

Comments

Project

Site

Lucas Lane

Classified by

Name:

Johnson, Tom

Date:

07/10/2016 11:12 UTC

Telephone:

01327 860060

Company:

Listers Geotechnical Consultants

Slapton Hill Barn, Blakesley Road

Slapton,

Towcester

NN12 8QD

Report

Created by: Johnson, Tom

Created date: 07/10/2016 11:12 UTC

Job summary

#	Sample Name	Depth [m]	Classification Result	Hazardous properties	Page
1	TP01	0.10	Non Hazardous		2
2	TP03	0.10	Non Hazardous		4
3	TP05	0.50	Non Hazardous		6
4	TP07	0.10	Non Hazardous		8
5	HA01	0.60	Non Hazardous		10
6	HA02	0.60	Non Hazardous		12
7	HA02[1]	1.00	Non Hazardous		14
8	HA03	0.25	Non Hazardous		16
9	HA03[1]	0.60	Non Hazardous		18
10	TP08	0.20	Non Hazardous		20

Appendices

	Page
Appendix A: Classifier defined and non CLP determinands	22
Appendix B: Notes	23
Appendix C: Version	24

Classification of sample: TP01



Non Hazardous Waste

Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:	LoW Code:
TP01	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.10 m	
Moisture content: 0% (wet weight correction)	

Hazard properties

None identified

Determinands (Moisture content: 0%, wet weight correction)

boron tribromide: (Cation conc. entered: 1 mg/kg, converted to compound conc.:23.173 mg/kg or 0.00232%)
 arsenic pentoxide: (Cation conc. entered: 33 mg/kg, converted to compound conc.:50.618 mg/kg or 0.00506%)
 cadmium iodide: (Cation conc. entered: 0.33 mg/kg, converted to compound conc.:1.075 mg/kg or 0.000108%)
 copper sulfate (hydrated): (Cation conc. entered: 26 mg/kg, converted to compound conc.:102.155 mg/kg or 0.0102%)
 mercury dichloride: (Cation conc. entered: 0.39 mg/kg, converted to compound conc.:0.528 mg/kg or 0.0000528%)
 nickel dichromate: (Cation conc. entered: 30 mg/kg, converted to compound conc.:140.398 mg/kg or 0.014%)
 lead chromate: (Cation conc. entered: 90 mg/kg, converted to compound conc.:140.383 mg/kg or 0.014%, Note 1 conc.: 0.009%)
 selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex: (Cation conc. entered: 0.25 mg/kg, converted to compound conc.:0.638 mg/kg or 0.0000638%)
 zinc sulphate: (Cation conc. entered: 110 mg/kg, converted to compound conc.:271.623 mg/kg or 0.0272%)
 chromium(VI) oxide: (Cation conc. entered: <0.5 mg/kg, converted to compound conc.:<0.962 mg/kg or <0.0000962%)
IGNORED Because: "<LOD"
 TPH (C6 to C40) petroleum group: (Whole conc. entered as: <10 mg/kg or <0.001%) **IGNORED Because: "<LOD"**
 naphthalene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) **IGNORED Because: "<LOD"**
 acenaphthylene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) **IGNORED Because: "<LOD"**
 acenaphthene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) **IGNORED Because: "<LOD"**
 fluorene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) **IGNORED Because: "<LOD"**
 phenanthrene: (Whole conc. entered as: 0.36 mg/kg or 0.000036%)
 anthracene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) **IGNORED Because: "<LOD"**
 fluoranthene: (Whole conc. entered as: 0.49 mg/kg or 0.000049%)
 pyrene: (Whole conc. entered as: 0.38 mg/kg or 0.000038%)
 benzo[a]anthracene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) **IGNORED Because: "<LOD"**
 chrysene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) **IGNORED Because: "<LOD"**
 benzo[b]fluoranthene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) **IGNORED Because: "<LOD"**
 benzo[k]fluoranthene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) **IGNORED Because: "<LOD"**
 benzo[a]pyrene; benzo[def]chrysene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) **IGNORED Because: "<LOD"**
 indeno[123-cd]pyrene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) **IGNORED Because: "<LOD"**
 dibenz[a,h]anthracene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) **IGNORED Because: "<LOD"**
 benzo[ghi]perylene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) **IGNORED Because: "<LOD"**

Notes utilised in assessment

C14: Step 5

"identify whether any individual ecotoxic substance is present at or above a cut-off value ..." , used on:

Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "arsenic pentoxide"
Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "cadmium iodide"
Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "copper sulfate (hydrated)"
Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "mercury dichloride"
Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "nickel dichromate"
Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "lead chromate"
Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex"
Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "zinc sulphate"
Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "phenanthrene"
Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "fluoranthene"
Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "pyrene"

Note 1 , used on:

Test: "HP 5 on STOT SE 2; H371, STOT RE 2; H373" for determinand: "lead chromate"
Test: "HP 7 on Carc. 1A; H350, Carc. 1B; H350, Carc. 1A; H350i, Carc. 1B; H350i" for determinand: "lead chromate"
Test: "HP 10 on Repr. 1A; H360, Repr. 1A; H360D, Repr. 1A; H360Df, Repr. 1A; H360F, Repr. 1A; H360Fd, Repr. 1A; H360FD, Repr. 1B; H360, Repr. 1B; H360D, Repr. 1B; H360Df, Repr. 1B; H360F, Repr. 1B; H360Fd, Repr. 1B; H360FD" for determinand: "lead chromate"
Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "lead chromate"

Determinand notes

Note 1 , used on:

determinand: "lead chromate"

Note A , used on:

determinand: "selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex"

Note H , used on:

determinand: "nickel dichromate"

Classification of sample: TP03



Non Hazardous Waste

Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:	LoW Code:
TP03	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.10 m	
Moisture content: 0% (wet weight correction)	

Hazard properties

None identified

Determinands (Moisture content: 0%, wet weight correction)

boron tribromide: (Cation conc. entered: 0.72 mg/kg, converted to compound conc.:16.685 mg/kg or 0.00167%)
 arsenic pentoxide: (Cation conc. entered: 32 mg/kg, converted to compound conc.:49.084 mg/kg or 0.00491%)
 cadmium iodide: (Cation conc. entered: 0.32 mg/kg, converted to compound conc.:1.043 mg/kg or 0.000104%)
 copper sulfate (hydrated): (Cation conc. entered: 24 mg/kg, converted to compound conc.:94.297 mg/kg or 0.00943%)
 mercury dichloride: (Cation conc. entered: 0.22 mg/kg, converted to compound conc.:0.298 mg/kg or 0.0000298%)
 nickel dichromate: (Cation conc. entered: 30 mg/kg, converted to compound conc.:140.398 mg/kg or 0.014%)
 lead chromate: (Cation conc. entered: 78 mg/kg, converted to compound conc.:121.666 mg/kg or 0.0122%, Note 1 conc.: 0.0078%)
 selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex: (Cation conc. entered: 0.21 mg/kg, converted to compound conc.:0.536 mg/kg or 0.0000536%)
 zinc sulphate: (Cation conc. entered: 86 mg/kg, converted to compound conc.:212.359 mg/kg or 0.0212%)
 chromium(VI) oxide: (Cation conc. entered: <0.5 mg/kg, converted to compound conc.:<0.962 mg/kg or <0.0000962%)
IGNORED Because: "<LOD"
 TPH (C6 to C40) petroleum group: (Whole conc. entered as: 48 mg/kg or 0.0048%)
 naphthalene: (Whole conc. entered as: 0.12 mg/kg or 0.000012%)
 acenaphthylene: (Whole conc. entered as: 0.16 mg/kg or 0.000016%)
 acenaphthene: (Whole conc. entered as: 0.34 mg/kg or 0.000034%)
 fluorene: (Whole conc. entered as: 0.48 mg/kg or 0.000048%)
 phenanthrene: (Whole conc. entered as: 5.7 mg/kg or 0.00057%)
 anthracene: (Whole conc. entered as: 0.98 mg/kg or 0.000098%)
 fluoranthene: (Whole conc. entered as: 5.3 mg/kg or 0.00053%)
 pyrene: (Whole conc. entered as: 4.7 mg/kg or 0.00047%)
 benzo[a]anthracene: (Whole conc. entered as: 2.1 mg/kg or 0.00021%)
 chrysene: (Whole conc. entered as: 0.27 mg/kg or 0.000027%)
 benzo[b]fluoranthene: (Whole conc. entered as: 2.6 mg/kg or 0.00026%)
 benzo[k]fluoranthene: (Whole conc. entered as: 1 mg/kg or 0.0001%)
 benzo[a]pyrene; benzo[def]chrysene: (Whole conc. entered as: 1.8 mg/kg or 0.00018%)
 indeno[123-cd]pyrene: (Whole conc. entered as: 1.1 mg/kg or 0.00011%)
 dibenz[a,h]anthracene: (Whole conc. entered as: 0.4 mg/kg or 0.00004%)
 benzo[ghi]perylene: (Whole conc. entered as: 0.87 mg/kg or 0.000087%)

Test Settings

HP 3(i) on Flam. Liq. 1; H224, Flam. Liq. 2; H225, Flam. Liq. 3; H226: **Force this test to non hazardous because: "TPH in non-flammable when mixed with soil"**

Notes utilised in assessment

C14: Step 5

"identify whether any individual ecotoxic substance is present at or above a cut-off value ..." , used on:

Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "arsenic pentoxide"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "cadmium iodide"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "copper sulfate (hydrated)"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "mercury dichloride"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "nickel dichromate"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "lead chromate"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "zinc sulphate"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "naphthalene"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "acenaphthene"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "fluorene"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "phenanthrene"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "anthracene"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "fluoranthene"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "pyrene"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "benzo[a]anthracene"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "chrysene"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "benzo[b]fluoranthene"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "benzo[k]fluoranthene"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "benzo[a]pyrene; benzo[def]chrysene"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "dibenz[a,h]anthracene"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "benzo[ghi]perylene"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "TPH (C6 to C40) petroleum group"

Determinand notes

Note 1 , used on:

determinand: "lead chromate"

Note A , used on:

determinand: "selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex"

Note H , used on:

determinand: "nickel dichromate"

WM3: Unknown oil , used on:

determinand: "TPH (C6 to C40) petroleum group"

Classification of sample: TP05



Non Hazardous Waste

Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:	LoW Code:
TP05	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.50 m	
Moisture content: 0% (wet weight correction)	

Hazard properties

None identified

Determinands (Moisture content: 0%, wet weight correction)

boron tribromide: (Cation conc. entered: 0.68 mg/kg, converted to compound conc.:15.758 mg/kg or 0.00158%)
 arsenic pentoxide: (Cation conc. entered: 30 mg/kg, converted to compound conc.:46.016 mg/kg or 0.0046%)
 cadmium iodide: (Cation conc. entered: 0.31 mg/kg, converted to compound conc.:1.01 mg/kg or 0.000101%)
 copper sulfate (hydrated): (Cation conc. entered: 20 mg/kg, converted to compound conc.:78.581 mg/kg or 0.00786%)
 mercury dichloride: (Cation conc. entered: 0.1 mg/kg, converted to compound conc.:0.135 mg/kg or 0.0000135%)
 nickel dichromate: (Cation conc. entered: 40 mg/kg, converted to compound conc.:187.197 mg/kg or 0.0187%)
 lead chromate: (Cation conc. entered: 29 mg/kg, converted to compound conc.:45.235 mg/kg or 0.00452%, Note 1 conc.: 0.0029%)
 selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex: (Cation conc. entered: <0.2 mg/kg, converted to compound conc.:<0.511 mg/kg or <0.0000511%) **IGNORED Because: "<LOD"**
 zinc sulphate: (Cation conc. entered: 110 mg/kg, converted to compound conc.:271.623 mg/kg or 0.0272%)
 chromium(VI) oxide: (Cation conc. entered: <0.5 mg/kg, converted to compound conc.:<0.962 mg/kg or <0.0000962%) **IGNORED Because: "<LOD"**
 TPH (C6 to C40) petroleum group: (Whole conc. entered as: <10 mg/kg or <0.001%) **IGNORED Because: "<LOD"**
 naphthalene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) **IGNORED Because: "<LOD"**
 acenaphthylene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) **IGNORED Because: "<LOD"**
 acenaphthene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) **IGNORED Because: "<LOD"**
 fluorene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) **IGNORED Because: "<LOD"**
 phenanthrene: (Whole conc. entered as: 0.4 mg/kg or 0.00004%)
 anthracene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) **IGNORED Because: "<LOD"**
 fluoranthene: (Whole conc. entered as: 0.38 mg/kg or 0.000038%)
 pyrene: (Whole conc. entered as: 0.3 mg/kg or 0.00003%)
 benzo[a]anthracene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) **IGNORED Because: "<LOD"**
 chrysene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) **IGNORED Because: "<LOD"**
 benzo[b]fluoranthene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) **IGNORED Because: "<LOD"**
 benzo[k]fluoranthene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) **IGNORED Because: "<LOD"**
 benzo[a]pyrene; benzo[def]chrysene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) **IGNORED Because: "<LOD"**
 indeno[123-cd]pyrene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) **IGNORED Because: "<LOD"**
 dibenz[a,h]anthracene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) **IGNORED Because: "<LOD"**
 benzo[ghi]perylene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) **IGNORED Because: "<LOD"**

Notes utilised in assessment

C14: Step 5

"identify whether any individual ecotoxic substance is present at or above a cut-off value ...", used on:

Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "arsenic pentoxide"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "cadmium iodide"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "copper sulfate (hydrated)"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "mercury dichloride"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "nickel dichromate"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "lead chromate"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "zinc sulphate"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "phenanthrene"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "fluoranthene"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "pyrene"

Note 1 , used on:

Test: "HP 5 on STOT SE 2; H371, STOT RE 2; H373" for determinand: "lead chromate"
 Test: "HP 7 on Carc. 1A; H350, Carc. 1B; H350, Carc. 1A; H350i, Carc. 1B; H350i" for determinand: "lead chromate"
 Test: "HP 10 on Repr. 1A; H360, Repr. 1A; H360D, Repr. 1A; H360Df, Repr. 1A; H360F, Repr. 1A; H360Fd, Repr. 1A; H360FD, Repr. 1B; H360, Repr. 1B; H360D, Repr. 1B; H360Df, Repr. 1B; H360F, Repr. 1B; H360Fd, Repr. 1B; H360FD" for determinand: "lead chromate"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "lead chromate"

Determinand notes

Note 1 , used on:

determinand: "lead chromate"

Note H , used on:

determinand: "nickel dichromate"

Classification of sample: TP07



Non Hazardous Waste

Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:	LoW Code:
TP07	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.10 m	
Moisture content: 0% (wet weight correction)	

Hazard properties

None identified

Determinands (Moisture content: 0%, wet weight correction)

boron tribromide: (Cation conc. entered: 1.1 mg/kg, converted to compound conc.:25.49 mg/kg or 0.00255%)
 arsenic pentoxide: (Cation conc. entered: 35 mg/kg, converted to compound conc.:53.686 mg/kg or 0.00537%)
 cadmium iodide: (Cation conc. entered: 0.42 mg/kg, converted to compound conc.:1.368 mg/kg or 0.000137%)
 copper sulfate (hydrated): (Cation conc. entered: 32 mg/kg, converted to compound conc.:125.73 mg/kg or 0.0126%)
 mercury dichloride: (Cation conc. entered: 0.34 mg/kg, converted to compound conc.:0.46 mg/kg or 0.000046%)
 nickel dichromate: (Cation conc. entered: 38 mg/kg, converted to compound conc.:177.838 mg/kg or 0.0178%)
 lead chromate: (Cation conc. entered: 97 mg/kg, converted to compound conc.:151.302 mg/kg or 0.0151%, Note 1 conc.: 0.0097%)
 selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex: (Cation conc. entered: 0.33 mg/kg, converted to compound conc.:0.843 mg/kg or 0.0000843%)
 zinc sulphate: (Cation conc. entered: 130 mg/kg, converted to compound conc.:321.009 mg/kg or 0.0321%)
 chromium(VI) oxide: (Cation conc. entered: <0.5 mg/kg, converted to compound conc.:<0.962 mg/kg or <0.0000962%)
IGNORED Because: "<LOD"
 TPH (C6 to C40) petroleum group: (Whole conc. entered as: 35 mg/kg or 0.0035%)
 naphthalene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) **IGNORED Because: "<LOD"**
 acenaphthylene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) **IGNORED Because: "<LOD"**
 acenaphthene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) **IGNORED Because: "<LOD"**
 fluorene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) **IGNORED Because: "<LOD"**
 phenanthrene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) **IGNORED Because: "<LOD"**
 anthracene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) **IGNORED Because: "<LOD"**
 fluoranthene: (Whole conc. entered as: 0.62 mg/kg or 0.000062%)
 pyrene: (Whole conc. entered as: 0.48 mg/kg or 0.000048%)
 benzo[a]anthracene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) **IGNORED Because: "<LOD"**
 chrysene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) **IGNORED Because: "<LOD"**
 benzo[b]fluoranthene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) **IGNORED Because: "<LOD"**
 benzo[k]fluoranthene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) **IGNORED Because: "<LOD"**
 benzo[a]pyrene; benzo[def]chrysene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) **IGNORED Because: "<LOD"**
 indeno[123-cd]pyrene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) **IGNORED Because: "<LOD"**
 dibenz[a,h]anthracene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) **IGNORED Because: "<LOD"**
 benzo[ghi]perylene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) **IGNORED Because: "<LOD"**

Test Settings

HP 3(i) on Flam. Liq. 1; H224, Flam. Liq. 2; H225, Flam. Liq. 3; H226: **Force this test to non hazardous because: "TPH in non-flammable when mixed with soil"**

Notes utilised in assessment

C14: Step 5

"identify whether any individual ecotoxic substance is present at or above a cut-off value ..." , used on:

Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "arsenic pentoxide"
Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "cadmium iodide"
Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "copper sulfate (hydrated)"
Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "mercury dichloride"
Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "nickel dichromate"
Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "lead chromate"
Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex"
Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "zinc sulphate"
Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "fluoranthene"
Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "pyrene"
Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "TPH (C6 to C40) petroleum group"

Determinand notes

Note 1 , used on:

determinand: "lead chromate"

Note A , used on:

determinand: "selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex"

Note H , used on:

determinand: "nickel dichromate"

WM3: Unknown oil , used on:

determinand: "TPH (C6 to C40) petroleum group"

Classification of sample: HA01



Non Hazardous Waste

Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:	LoW Code:
HA01	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.60 m	
Moisture content: 0% (wet weight correction)	

Hazard properties

None identified

Determinands (Moisture content: 0%, wet weight correction)

boron tribromide: (Cation conc. entered: 3.5 mg/kg, converted to compound conc.:81.105 mg/kg or 0.00811%)
 arsenic pentoxide: (Cation conc. entered: 71 mg/kg, converted to compound conc.:108.905 mg/kg or 0.0109%)
 cadmium iodide: (Cation conc. entered: 0.74 mg/kg, converted to compound conc.:2.411 mg/kg or 0.000241%)
 copper sulfate (hydrated): (Cation conc. entered: 48 mg/kg, converted to compound conc.:188.595 mg/kg or 0.0189%)
 mercury dichloride: (Cation conc. entered: 0.44 mg/kg, converted to compound conc.:0.596 mg/kg or 0.0000596%)
 nickel dichromate: (Cation conc. entered: 52 mg/kg, converted to compound conc.:243.357 mg/kg or 0.0243%)
 lead chromate: (Cation conc. entered: 510 mg/kg, converted to compound conc.:795.506 mg/kg or 0.0796%, Note 1 conc.: 0.051%)
 selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex: (Cation conc. entered: 0.56 mg/kg, converted to compound conc.:1.43 mg/kg or 0.000143%)
 zinc sulphate: (Cation conc. entered: 340 mg/kg, converted to compound conc.:839.561 mg/kg or 0.084%)
 chromium(VI) oxide: (Cation conc. entered: <0.5 mg/kg, converted to compound conc.:<0.962 mg/kg or <0.0000962%)
IGNORED Because: "<LOD"
 TPH (C6 to C40) petroleum group: (Whole conc. entered as: 82 mg/kg or 0.0082%)
 naphthalene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) **IGNORED Because: "<LOD"**
 acenaphthylene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) **IGNORED Because: "<LOD"**
 acenaphthene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) **IGNORED Because: "<LOD"**
 fluorene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) **IGNORED Because: "<LOD"**
 phenanthrene: (Whole conc. entered as: 0.96 mg/kg or 0.000096%)
 anthracene: (Whole conc. entered as: 0.22 mg/kg or 0.000022%)
 fluoranthene: (Whole conc. entered as: 2 mg/kg or 0.0002%)
 pyrene: (Whole conc. entered as: 1.8 mg/kg or 0.00018%)
 benzo[a]anthracene: (Whole conc. entered as: 0.88 mg/kg or 0.000088%)
 chrysene: (Whole conc. entered as: 1.5 mg/kg or 0.00015%)
 benzo[b]fluoranthene: (Whole conc. entered as: 1.3 mg/kg or 0.00013%)
 benzo[k]fluoranthene: (Whole conc. entered as: 0.6 mg/kg or 0.00006%)
 benzo[a]pyrene; benzo[def]chrysene: (Whole conc. entered as: 0.99 mg/kg or 0.000099%)
 indeno[123-cd]pyrene: (Whole conc. entered as: 0.73 mg/kg or 0.000073%)
 dibenz[a,h]anthracene: (Whole conc. entered as: 0.17 mg/kg or 0.000017%)
 benzo[ghi]perylene: (Whole conc. entered as: 0.83 mg/kg or 0.000083%)

Test Settings

HP 3(i) on Flam. Liq. 1; H224, Flam. Liq. 2; H225, Flam. Liq. 3; H226: **Force this test to non hazardous because: "TPH in non-flammable when mixed with soil"**

Notes utilised in assessment

C14: Step 5

"identify whether any individual ecotoxic substance is present at or above a cut-off value ..." , used on:

Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "arsenic pentoxide"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "cadmium iodide"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "copper sulfate (hydrated)"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "mercury dichloride"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "nickel dichromate"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "lead chromate"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "zinc sulphate"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "phenanthrene"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "anthracene"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "fluoranthene"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "pyrene"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "benzo[a]anthracene"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "chrysene"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "benzo[b]fluoranthene"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "benzo[k]fluoranthene"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "benzo[a]pyrene; benzo[def]chrysene"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "dibenz[a,h]anthracene"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "benzo[ghi]perylene"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "TPH (C6 to C40) petroleum group"

Note 1 , used on:

Test: "HP 5 on STOT SE 2; H371, STOT RE 2; H373" for determinand: "lead chromate"
 Test: "HP 7 on Carc. 1A; H350, Carc. 1B; H350, Carc. 1A; H350i, Carc. 1B; H350i" for determinand: "lead chromate"
 Test: "HP 10 on Repr. 1A; H360, Repr. 1A; H360D, Repr. 1A; H360Df, Repr. 1A; H360F, Repr. 1A; H360Fd, Repr. 1A; H360FD, Repr. 1B; H360, Repr. 1B; H360D, Repr. 1B; H360Df, Repr. 1B; H360F, Repr. 1B; H360Fd, Repr. 1B; H360FD" for determinand: "lead chromate"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "lead chromate"

Determinand notes

Note 1 , used on:

determinand: "lead chromate"

Note A , used on:

determinand: "selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex"

Note H , used on:

determinand: "nickel dichromate"

WM3: Unknown oil , used on:

determinand: "TPH (C6 to C40) petroleum group"

Classification of sample: HA02



Non Hazardous Waste

Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:	LoW Code:
HA02	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.60 m	
Moisture content: 0% (wet weight correction)	

Hazard properties

None identified

Determinands (Moisture content: 0%, wet weight correction)

boron tribromide: (Cation conc. entered: 2.1 mg/kg, converted to compound conc.:48.663 mg/kg or 0.00487%)
 arsenic pentoxide: (Cation conc. entered: 61 mg/kg, converted to compound conc.:93.566 mg/kg or 0.00936%)
 cadmium iodide: (Cation conc. entered: 4.6 mg/kg, converted to compound conc.:14.986 mg/kg or 0.0015%)
 copper sulfate (hydrated): (Cation conc. entered: 110 mg/kg, converted to compound conc.:432.196 mg/kg or 0.0432%)
 mercury dichloride: (Cation conc. entered: 0.43 mg/kg, converted to compound conc.:0.582 mg/kg or 0.000582%)
 nickel dichromate: (Cation conc. entered: 50 mg/kg, converted to compound conc.:233.997 mg/kg or 0.0234%)
 lead chromate: (Cation conc. entered: 330 mg/kg, converted to compound conc.:514.739 mg/kg or 0.0515%, Note 1 conc.: 0.033%)
 selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex: (Cation conc. entered: 0.48 mg/kg, converted to compound conc.:1.226 mg/kg or 0.000123%)
 zinc sulphate: (Cation conc. entered: 250 mg/kg, converted to compound conc.:617.324 mg/kg or 0.0617%)
 chromium(VI) oxide: (Cation conc. entered: <0.5 mg/kg, converted to compound conc.:<0.962 mg/kg or <0.0000962%)
IGNORED Because: "<LOD"
 TPH (C6 to C40) petroleum group: (Whole conc. entered as: 64 mg/kg or 0.0064%)
 naphthalene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) **IGNORED Because: "<LOD"**
 acenaphthylene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) **IGNORED Because: "<LOD"**
 acenaphthene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) **IGNORED Because: "<LOD"**
 fluorene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) **IGNORED Because: "<LOD"**
 phenanthrene: (Whole conc. entered as: 0.77 mg/kg or 0.000077%)
 anthracene: (Whole conc. entered as: 0.18 mg/kg or 0.000018%)
 fluoranthene: (Whole conc. entered as: 2.3 mg/kg or 0.00023%)
 pyrene: (Whole conc. entered as: 2.2 mg/kg or 0.00022%)
 benzo[a]anthracene: (Whole conc. entered as: 1.2 mg/kg or 0.00012%)
 chrysene: (Whole conc. entered as: 1.8 mg/kg or 0.00018%)
 benzo[b]fluoranthene: (Whole conc. entered as: 2 mg/kg or 0.0002%)
 benzo[k]fluoranthene: (Whole conc. entered as: 0.88 mg/kg or 0.000088%)
 benzo[a]pyrene; benzo[def]chrysene: (Whole conc. entered as: 1.6 mg/kg or 0.00016%)
 indeno[123-cd]pyrene: (Whole conc. entered as: 1.2 mg/kg or 0.00012%)
 dibenz[a,h]anthracene: (Whole conc. entered as: 0.21 mg/kg or 0.000021%)
 benzo[ghi]perylene: (Whole conc. entered as: 1.5 mg/kg or 0.00015%)

Test Settings

HP 3(i) on Flam. Liq. 1; H224, Flam. Liq. 2; H225, Flam. Liq. 3; H226: **Force this test to non hazardous because: "TPH in non-flammable when mixed with soil"**

Notes utilised in assessment

C14: Step 5

"identify whether any individual ecotoxic substance is present at or above a cut-off value ..." , used on:

Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "arsenic pentoxide"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "cadmium iodide"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "copper sulfate (hydrated)"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "mercury dichloride"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "nickel dichromate"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "lead chromate"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "zinc sulphate"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "phenanthrene"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "anthracene"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "fluoranthene"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "pyrene"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "benzo[a]anthracene"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "chrysene"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "benzo[b]fluoranthene"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "benzo[k]fluoranthene"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "benzo[a]pyrene; benzo[def]chrysene"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "dibenz[a,h]anthracene"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "benzo[ghi]perylene"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "TPH (C6 to C40) petroleum group"

Determinand notes

Note 1 , used on:

determinand: "lead chromate"

Note A , used on:

determinand: "selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex"

Note H , used on:

determinand: "nickel dichromate"

WM3: Unknown oil , used on:

determinand: "TPH (C6 to C40) petroleum group"

Classification of sample: HA02[1]



Non Hazardous Waste

Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:	LoW Code:
HA02[1]	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
1.00 m	
Moisture content: 0% (wet weight correction)	

Hazard properties

None identified

Determinands (Moisture content: 0%, wet weight correction)

boron tribromide: (Cation conc. entered: 2.5 mg/kg, converted to compound conc.:57.932 mg/kg or 0.00579%)
 arsenic pentoxide: (Cation conc. entered: 56 mg/kg, converted to compound conc.:85.897 mg/kg or 0.00859%)
 cadmium iodide: (Cation conc. entered: 0.59 mg/kg, converted to compound conc.:1.922 mg/kg or 0.000192%)
 copper sulfate (hydrated): (Cation conc. entered: 48 mg/kg, converted to compound conc.:188.595 mg/kg or 0.0189%)
 mercury dichloride: (Cation conc. entered: 0.41 mg/kg, converted to compound conc.:0.555 mg/kg or 0.0000555%)
 nickel dichromate: (Cation conc. entered: 52 mg/kg, converted to compound conc.:243.357 mg/kg or 0.0243%)
 lead chromate: (Cation conc. entered: 240 mg/kg, converted to compound conc.:374.356 mg/kg or 0.0374%, Note 1 conc.: 0.024%)
 selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex: (Cation conc. entered: 0.35 mg/kg, converted to compound conc.:0.894 mg/kg or 0.0000894%)
 zinc sulphate: (Cation conc. entered: 210 mg/kg, converted to compound conc.:518.552 mg/kg or 0.0519%)
 chromium(VI) oxide: (Cation conc. entered: <0.5 mg/kg, converted to compound conc.:<0.962 mg/kg or <0.0000962%)
IGNORED Because: "<LOD"
 TPH (C6 to C40) petroleum group: (Whole conc. entered as: 41 mg/kg or 0.0041%)
 naphthalene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) **IGNORED Because: "<LOD"**
 acenaphthylene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) **IGNORED Because: "<LOD"**
 acenaphthene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) **IGNORED Because: "<LOD"**
 fluorene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) **IGNORED Because: "<LOD"**
 phenanthrene: (Whole conc. entered as: 0.5 mg/kg or 0.00005%)
 anthracene: (Whole conc. entered as: 0.1 mg/kg or 0.00001%)
 fluoranthene: (Whole conc. entered as: 1.3 mg/kg or 0.00013%)
 pyrene: (Whole conc. entered as: 1.2 mg/kg or 0.00012%)
 benzo[a]anthracene: (Whole conc. entered as: 0.51 mg/kg or 0.000051%)
 chrysene: (Whole conc. entered as: 0.59 mg/kg or 0.000059%)
 benzo[b]fluoranthene: (Whole conc. entered as: 0.97 mg/kg or 0.000097%)
 benzo[k]fluoranthene: (Whole conc. entered as: 0.4 mg/kg or 0.00004%)
 benzo[a]pyrene; benzo[def]chrysene: (Whole conc. entered as: 0.78 mg/kg or 0.000078%)
 indeno[123-cd]pyrene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) **IGNORED Because: "<LOD"**
 dibenz[a,h]anthracene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) **IGNORED Because: "<LOD"**
 benzo[ghi]perylene: (Whole conc. entered as: 0.62 mg/kg or 0.000062%)

Test Settings

HP 3(i) on Flam. Liq. 1; H224, Flam. Liq. 2; H225, Flam. Liq. 3; H226: **Force this test to non hazardous because: "TPH in non-flammable when mixed with soil"**

Notes utilised in assessment

C14: Step 5

"identify whether any individual ecotoxic substance is present at or above a cut-off value ..." , used on:

Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "arsenic pentoxide"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "cadmium iodide"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "copper sulfate (hydrated)"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "mercury dichloride"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "nickel dichromate"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "lead chromate"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "zinc sulphate"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "phenanthrene"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "anthracene"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "fluoranthene"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "pyrene"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "benzo[a]anthracene"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "chrysene"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "benzo[b]fluoranthene"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "benzo[k]fluoranthene"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "benzo[a]pyrene; benzo[def]chrysene"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "benzo[ghi]perylene"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "TPH (C6 to C40) petroleum group"

Note 1 , used on:

Test: "HP 5 on STOT SE 2; H371, STOT RE 2; H373" for determinand: "lead chromate"
 Test: "HP 7 on Carc. 1A; H350, Carc. 1B; H350, Carc. 1A; H350i, Carc. 1B; H350i" for determinand: "lead chromate"
 Test: "HP 10 on Repr. 1A; H360, Repr. 1A; H360D, Repr. 1A; H360Df, Repr. 1A; H360F, Repr. 1A; H360Fd, Repr. 1A; H360FD, Repr. 1B; H360, Repr. 1B; H360D, Repr. 1B; H360Df, Repr. 1B; H360F, Repr. 1B; H360Fd, Repr. 1B; H360FD" for determinand: "lead chromate"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "lead chromate"

Determinand notes

Note 1 , used on:

determinand: "lead chromate"

Note A , used on:

determinand: "selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex"

Note H , used on:

determinand: "nickel dichromate"

WM3: Unknown oil , used on:

determinand: "TPH (C6 to C40) petroleum group"

Classification of sample: HA03



Non Hazardous Waste

Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:	LoW Code:
HA03	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.25 m	
Moisture content: 0% (wet weight correction)	

Hazard properties

None identified

Determinands (Moisture content: 0%, wet weight correction)

boron tribromide: (Cation conc. entered: 2.7 mg/kg, converted to compound conc.:62.567 mg/kg or 0.00626%)
 arsenic pentoxide: (Cation conc. entered: 44 mg/kg, converted to compound conc.:67.491 mg/kg or 0.00675%)
 cadmium iodide: (Cation conc. entered: 0.38 mg/kg, converted to compound conc.:1.238 mg/kg or 0.000124%)
 copper sulfate (hydrated): (Cation conc. entered: 32 mg/kg, converted to compound conc.:125.73 mg/kg or 0.0126%)
 mercury dichloride: (Cation conc. entered: 0.72 mg/kg, converted to compound conc.:0.975 mg/kg or 0.0000975%)
 nickel dichromate: (Cation conc. entered: 37 mg/kg, converted to compound conc.:173.158 mg/kg or 0.0173%)
 lead chromate: (Cation conc. entered: 150 mg/kg, converted to compound conc.:233.972 mg/kg or 0.0234%, Note 1 conc.: 0.015%)
 selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex: (Cation conc. entered: 0.5 mg/kg, converted to compound conc.:1.277 mg/kg or 0.000128%)
 zinc sulphate: (Cation conc. entered: 180 mg/kg, converted to compound conc.:444.473 mg/kg or 0.0444%)
 chromium(VI) oxide: (Cation conc. entered: <0.5 mg/kg, converted to compound conc.:<0.962 mg/kg or <0.0000962%)
IGNORED Because: "<LOD"
 TPH (C6 to C40) petroleum group: (Whole conc. entered as: <10 mg/kg or <0.001%) **IGNORED Because: "<LOD"**
 naphthalene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) **IGNORED Because: "<LOD"**
 acenaphthylene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) **IGNORED Because: "<LOD"**
 acenaphthene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) **IGNORED Because: "<LOD"**
 fluorene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) **IGNORED Because: "<LOD"**
 phenanthrene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) **IGNORED Because: "<LOD"**
 anthracene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) **IGNORED Because: "<LOD"**
 fluoranthene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) **IGNORED Because: "<LOD"**
 pyrene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) **IGNORED Because: "<LOD"**
 benzo[a]anthracene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) **IGNORED Because: "<LOD"**
 chrysene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) **IGNORED Because: "<LOD"**
 benzo[b]fluoranthene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) **IGNORED Because: "<LOD"**
 benzo[k]fluoranthene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) **IGNORED Because: "<LOD"**
 benzo[a]pyrene; benzo[def]chrysene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) **IGNORED Because: "<LOD"**
 indeno[123-cd]pyrene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) **IGNORED Because: "<LOD"**
 dibenz[a,h]anthracene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) **IGNORED Because: "<LOD"**
 benzo[ghi]perylene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) **IGNORED Because: "<LOD"**

Notes utilised in assessment

C14: Step 5

"identify whether any individual ecotoxic substance is present at or above a cut-off value ..." , used on:

Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "arsenic pentoxide"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "cadmium iodide"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "copper sulfate (hydrated)"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "mercury dichloride"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "nickel dichromate"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "lead chromate"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "zinc sulphate"

Determinand notes

Note 1 , used on:

determinand: "lead chromate"

Note A , used on:

determinand: "selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex"

Note H , used on:

determinand: "nickel dichromate"

Classification of sample: HA03[1]



Non Hazardous Waste

Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:	LoW Code:
HA03[1]	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.60 m	
Moisture content: 0% (wet weight correction)	

Hazard properties

None identified

Determinands (Moisture content: 0%, wet weight correction)

boron tribromide: (Cation conc. entered: 2.4 mg/kg, converted to compound conc.:55.615 mg/kg or 0.00556%)
 arsenic pentoxide: (Cation conc. entered: 42 mg/kg, converted to compound conc.:64.423 mg/kg or 0.00644%)
 cadmium iodide: (Cation conc. entered: 0.35 mg/kg, converted to compound conc.:1.14 mg/kg or 0.000114%)
 copper sulfate (hydrated): (Cation conc. entered: 29 mg/kg, converted to compound conc.:113.943 mg/kg or 0.0114%)
 mercury dichloride: (Cation conc. entered: 0.56 mg/kg, converted to compound conc.:0.758 mg/kg or 0.0000758%)
 nickel dichromate: (Cation conc. entered: 39 mg/kg, converted to compound conc.:182.518 mg/kg or 0.0183%)
 lead chromate: (Cation conc. entered: 110 mg/kg, converted to compound conc.:171.58 mg/kg or 0.0172%, Note 1 conc.: 0.011%)
 selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex: (Cation conc. entered: 0.3 mg/kg, converted to compound conc.:0.766 mg/kg or 0.0000766%)
 zinc sulphate: (Cation conc. entered: 140 mg/kg, converted to compound conc.:345.701 mg/kg or 0.0346%)
 chromium(VI) oxide: (Cation conc. entered: <0.5 mg/kg, converted to compound conc.:<0.962 mg/kg or <0.0000962%)
IGNORED Because: "<LOD"
 TPH (C6 to C40) petroleum group: (Whole conc. entered as: <10 mg/kg or <0.001%) **IGNORED Because: "<LOD"**
 naphthalene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) **IGNORED Because: "<LOD"**
 acenaphthylene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) **IGNORED Because: "<LOD"**
 acenaphthene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) **IGNORED Because: "<LOD"**
 fluorene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) **IGNORED Because: "<LOD"**
 phenanthrene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) **IGNORED Because: "<LOD"**
 anthracene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) **IGNORED Because: "<LOD"**
 fluoranthene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) **IGNORED Because: "<LOD"**
 pyrene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) **IGNORED Because: "<LOD"**
 benzo[a]anthracene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) **IGNORED Because: "<LOD"**
 chrysene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) **IGNORED Because: "<LOD"**
 benzo[b]fluoranthene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) **IGNORED Because: "<LOD"**
 benzo[k]fluoranthene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) **IGNORED Because: "<LOD"**
 benzo[a]pyrene; benzo[def]chrysene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) **IGNORED Because: "<LOD"**
 indeno[123-cd]pyrene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) **IGNORED Because: "<LOD"**
 dibenz[a,h]anthracene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) **IGNORED Because: "<LOD"**
 benzo[ghi]perylene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) **IGNORED Because: "<LOD"**

Notes utilised in assessment

C14: Step 5

"identify whether any individual ecotoxic substance is present at or above a cut-off value ..." , used on:

Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "arsenic pentoxide"
Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "cadmium iodide"
Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "copper sulfate (hydrated)"
Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "mercury dichloride"
Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "nickel dichromate"
Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "lead chromate"
Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex"
Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "zinc sulphate"

Note 1 , used on:

Test: "HP 5 on STOT SE 2; H371, STOT RE 2; H373" for determinand: "lead chromate"
Test: "HP 7 on Carc. 1A; H350, Carc. 1B; H350, Carc. 1A; H350i, Carc. 1B; H350i" for determinand: "lead chromate"
Test: "HP 10 on Repr. 1A; H360, Repr. 1A; H360D, Repr. 1A; H360Df, Repr. 1A; H360F, Repr. 1A; H360Fd, Repr. 1A; H360FD, Repr. 1B; H360, Repr. 1B; H360D, Repr. 1B; H360Df, Repr. 1B; H360F, Repr. 1B; H360Fd, Repr. 1B; H360FD" for determinand: "lead chromate"
Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "lead chromate"

Determinand notes

Note 1 , used on:

determinand: "lead chromate"

Note A , used on:

determinand: "selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex"

Note H , used on:

determinand: "nickel dichromate"

Classification of sample: TP08



Non Hazardous Waste

Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:	LoW Code:
TP08	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.20 m	
Moisture content: 0% (wet weight correction)	

Hazard properties

None identified

Determinands (Moisture content: 0%, wet weight correction)

boron tribromide: (Cation conc. entered: 2.9 mg/kg, converted to compound conc.: 67.202 mg/kg or 0.00672%)
 arsenic pentoxide: (Cation conc. entered: 57 mg/kg, converted to compound conc.: 87.431 mg/kg or 0.00874%)
 cadmium iodide: (Cation conc. entered: 0.97 mg/kg, converted to compound conc.: 3.16 mg/kg or 0.000316%)
 copper sulfate (hydrated): (Cation conc. entered: 39 mg/kg, converted to compound conc.: 153.233 mg/kg or 0.0153%)
 mercury dichloride: (Cation conc. entered: 0.59 mg/kg, converted to compound conc.: 0.799 mg/kg or 0.0000799%)
 nickel dichromate: (Cation conc. entered: 49 mg/kg, converted to compound conc.: 229.317 mg/kg or 0.0229%)
 lead chromate: (Cation conc. entered: 320 mg/kg, converted to compound conc.: 499.141 mg/kg or 0.0499%, Note 1 conc.: 0.032%)
 selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex: (Cation conc. entered: 0.48 mg/kg, converted to compound conc.: 1.226 mg/kg or 0.000123%)
 zinc sulphate: (Cation conc. entered: 460 mg/kg, converted to compound conc.: 1135.876 mg/kg or 0.114%)
 chromium(VI) oxide: (Cation conc. entered: <0.5 mg/kg, converted to compound conc.: <0.962 mg/kg or <0.0000962%)
IGNORED Because: "<LOD"
 TPH (C6 to C40) petroleum group: (Whole conc. entered as: 67 mg/kg or 0.0067%)
 naphthalene: (Whole conc. entered as: 0.26 mg/kg or 0.000026%)
 acenaphthylene: (Whole conc. entered as: 0.13 mg/kg or 0.000013%)
 acenaphthene: (Whole conc. entered as: <0.1 mg/kg or <0.00001%) **IGNORED Because: "<LOD"**
 fluorene: (Whole conc. entered as: 0.13 mg/kg or 0.000013%)
 phenanthrene: (Whole conc. entered as: 1.6 mg/kg or 0.00016%)
 anthracene: (Whole conc. entered as: 0.15 mg/kg or 0.000015%)
 fluoranthene: (Whole conc. entered as: 3 mg/kg or 0.0003%)
 pyrene: (Whole conc. entered as: 3 mg/kg or 0.0003%)
 benzo[a]anthracene: (Whole conc. entered as: 1.1 mg/kg or 0.00011%)
 chrysene: (Whole conc. entered as: 1.8 mg/kg or 0.00018%)
 benzo[b]fluoranthene: (Whole conc. entered as: 1.8 mg/kg or 0.00018%)
 benzo[k]fluoranthene: (Whole conc. entered as: 0.68 mg/kg or 0.000068%)
 benzo[a]pyrene; benzo[def]chrysene: (Whole conc. entered as: 1.3 mg/kg or 0.00013%)
 indeno[123-cd]pyrene: (Whole conc. entered as: 0.84 mg/kg or 0.000084%)
 dibenz[a,h]anthracene: (Whole conc. entered as: 0.22 mg/kg or 0.000022%)
 benzo[ghi]perylene: (Whole conc. entered as: 0.96 mg/kg or 0.000096%)

Test Settings

HP 3(i) on Flam. Liq. 1; H224, Flam. Liq. 2; H225, Flam. Liq. 3; H226: **Force this test to non hazardous because: "TPH in non-flammable when mixed with soil"**

Notes utilised in assessment

C14: Step 5

"identify whether any individual ecotoxic substance is present at or above a cut-off value ..." , used on:

Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "arsenic pentoxide"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "cadmium iodide"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "copper sulfate (hydrated)"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "mercury dichloride"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "nickel dichromate"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "lead chromate"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "naphthalene"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "fluorene"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "phenanthrene"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "anthracene"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "fluoranthene"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "pyrene"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "benzo[a]anthracene"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "chrysene"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "benzo[b]fluoranthene"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "benzo[k]fluoranthene"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "benzo[a]pyrene; benzo[def]chrysene"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "dibenz[a,h]anthracene"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "benzo[ghi]perylene"
 Test: "HP 14 on R50, R50/53, R51/53, R52/53, R52, R53" for determinand: "TPH (C6 to C40) petroleum group"

Determinand notes

Note 1 , used on:

determinand: "lead chromate"

Note A , used on:

determinand: "selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex"

Note H , used on:

determinand: "nickel dichromate"

WM3: Unknown oil , used on:

determinand: "TPH (C6 to C40) petroleum group"

Appendix A: Classifier defined and non CLP determinands

TPH (C6 to C40) petroleum group (CAS Number: TPH)

Comments: Hazard statements taken from WM3 1st Edition 2015; Risk phrases: WM2 3rd Edition 2013

Data source: WM3 1st Edition 2015

Data source date: 25/05/2015

Risk Phrases: R10, R45, R46, R51/53, R63, R65

Hazard Statements: Flam. Liq. 3; H226, Asp. Tox. 1; H304, STOT RE 2; H373, Muta. 1B; H340, Carc. 1B; H350, Repr. 2; H361d, Aquatic Chronic 2; H411

acenaphthylene (CAS Number: 208-96-8)

Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 17/07/2015

Risk Phrases: R22, R26, R27, R36, R37, R38

Hazard Statements: Acute Tox. 4; H302, Acute Tox. 1; H330, Acute Tox. 1; H310, Eye Irrit. 2; H319, STOT SE 3; H335, Skin Irrit. 2; H315

acenaphthene (CAS Number: 83-32-9)

Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 17/07/2015

Risk Phrases: R36, R37, R38, N; R50/53, N; R51/53

Hazard Statements: Eye Irrit. 2; H319, STOT SE 3; H335, Skin Irrit. 2; H315, Aquatic Acute 1; H400, Aquatic Chronic 1; H410, Aquatic Chronic 2; H411

fluorene (CAS Number: 86-73-7)

Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 06/08/2015

Risk Phrases: N; R50/53

Hazard Statements: Aquatic Acute 1; H400, Aquatic Chronic 1; H410

phenanthrene (CAS Number: 85-01-8)

Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 06/08/2015

Risk Phrases: R22, R36, R37, R38, R40, R43, N; R50/53

Hazard Statements: Acute Tox. 4; H302, Eye Irrit. 2; H319, STOT SE 3; H335, Carc. 2; H351, Skin Sens. 1; H317, Aquatic Acute 1; H400, Aquatic Chronic 1; H410, Skin Irrit. 2; H315

anthracene (CAS Number: 120-12-7)

Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 17/07/2015

Risk Phrases: R36, R37, R38, R43, N; R50/53

Hazard Statements: Eye Irrit. 2; H319, STOT SE 3; H335, Skin Irrit. 2; H315, Skin Sens. 1; H317, Aquatic Acute 1; H400, Aquatic Chronic 1; H410

fluoranthene (CAS Number: 206-44-0)

Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 21/08/2015

Risk Phrases: Xn; R22, N; R50/53

Hazard Statements: Acute Tox. 4; H302, Aquatic Acute 1; H400, Aquatic Chronic 1; H410

pyrene (CAS Number: 129-00-0)

Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 2014

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 21/08/2015

Risk Phrases: Xi; R36/37/38, N; R50/53

Hazard Statements: Skin Irrit. 2; H315, Eye Irrit. 2; H319, STOT SE 3; H335, Aquatic Acute 1; H400, Aquatic Chronic 1; H410

indeno[123-cd]pyrene (CAS Number: 193-39-5)

Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 06/08/2015

Risk Phrases: R40

Hazard Statements: Carc. 2; H351

benzo[ghi]perylene (CAS Number: 191-24-2)

Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 28/02/2015

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 23/07/2015

Risk Phrases: N; R50/53

Hazard Statements: Aquatic Acute 1; H400, Aquatic Chronic 1; H410

Appendix B: Notes

C14: Step 5

from section: WM3: C14 in the document: "[WM3 - Waste Classification](#)"

"identify whether any individual ecotoxic substance is present at or above a cut-off value ..."

Note 1

from section: 1.1.3.2, Annex VI in the document: "[CLP Regulations](#)"

"The concentration stated or, in the absence of such concentrations, the generic concentrations of this Regulation (Table 3.1) or the generic concentrations of Directive 1999/45/EC (Table 3.2), are the percentages by weight of the metallic element calculated with reference to the total weight of the mixture."

Note A

from section: 1.1.3.1, Annex VI in the document: "[CLP Regulations](#)"

"Without prejudice to Article 17(2), the name of the substance must appear on the label in the form of one of the designations given in Part 3. In Part 3, use is sometimes made of a general description such as '... compounds' or '... salts'. In this case, the supplier is required to state on the label the correct name, due account being taken of section 1.1.1.4."

Note H

from section: 1.1.3.1, Annex VI in the document: "[CLP Regulations](#)"

"The classification and label shown for this substance applies to the dangerous property(ies) indicated by the risk phrase(s) in combination with the category(ies) of danger shown. Manufacturers, importers and downstream users of this substance shall be obliged to carry out an investigation to make themselves aware of the relevant and accessible data which exists for all other properties to classify and label the substance. The final label shall follow the requirements of section 7 of Annex VI to Directive 67/548/EEC."

WM3: Unknown oil

from section: Chapter 3: 4. Waste oils and other wastes containing or contaminated with oil in the document: "[WM3 - Waste Classification](#)"

"If the identity of the oil is unknown, and the petroleum group cannot be established, then the oil contaminating the waste can be classified as non-carcinogenic due to the presence of oil if all three of the following criteria are met:

- the waste contains **benzo[a]pyrene (BaP)** at a concentration of less than 0.01% (1/10,000th) of the TPH concentration (This is the carcinogenic limit specified in table 3.2 of the CLP for BaP)
- this has been determined by an appropriate and representative sampling approach in accordance with the principles set out in Appendix D, and
- the analysis clearly demonstrates, for example by carbon bands or chromatograph, and the laboratory has reasonably concluded that the hydrocarbons present have not arisen from petrol or diesel

"

Appendix C: Version

Classification utilises the following:

- CLP Regulations - Regulation 1272/2008/EC of 16 December 2008
- 1st ATP - Regulation 790/2009/EC of 10 August 2009
- 2nd ATP - Regulation 286/2011/EC of 10 March 2011
- 3rd ATP - Regulation 618/2012/EU of 10 July 2012
- 4th ATP - Regulation 487/2013/EU of 8 May 2013
- Correction to 1st ATP - Regulation 758/2013/EU of 7 August 2013
- 5th ATP - Regulation 944/2013/EU of 2 October 2013
- 6th ATP - Regulation 605/2014/EU of 5 June 2014
- WFD Annex III replacement - Regulation 1357/2014/EU of 18 December 2014
- Revised List of Wastes 2014 - Decision 2014/955/EU of 18 December 2014
- WM3 - Waste Classification - May 2015
- 7th ATP - Regulation 2015/1221/EU of 24 July 2015
- 8th ATP - Regulation (EU) 2016/918 of 19 May 2016
- POPs Regulation 2004 - Regulation 850/2004/EC of 29 April 2004
- 1st ATP to POPs Regulation - Regulation 756/2010/EU of 24 August 2010
- 2nd ATP to POPs Regulation - Regulation 757/2010/EU of 24 August 2010

HazWasteOnline Engine: WM3 1st Edition, May 2015

HazWasteOnline Engine Version: 2016.266.3109.6166 (22 Sep 2016)

HazWasteOnline Database: 2016.266.3109.6166 (22 Sep 2016)



2183

Final Report

Report No.: 16-19272-1

Initial Date of Issue: 19-Aug-2016

Client Listers Geotechnical Consultants

Client Address: Slapton Hill Barn, Blakesley Road
Slapton
Towcester
Northamptonshire
NN12 8QD

Contact(s): Matthew Clarke

Project 16.07.021 Land at Lucas Lane, Hitchin,
Hertfordshire

Quotation No.: **Date Received:** 12-Aug-2016

Order No.: 16.07.021/535 **Date Instructed:** 12-Aug-2016

No. of Samples: 2

Turnaround (Wkdays): 5 **Results Due:** 18-Aug-2016

Date Approved: 19-Aug-2016

Approved By:



Details: Keith Jones, Technical Manager

Results - 2 Stage WAC

Project: 16.07.021 Land at Lucas Lane, Hitchin, Hertfordshire

Chemtest Job No: 16-19272 Chemtest Sample ID: 336460 Sample Ref: Sample ID: HA02 / HA03 Top Depth(m): 0.60 Bottom Depth(m): 1.00 Sampling Date: 08-Aug-2016							Landfill Waste Acceptance Criteria Limits		
							Inert Waste Landfill	Stable, Non-reactive hazardous waste in non-hazardous Landfill	Hazardous Waste Landfill
Determinand	SOP	Accred.	Units						
Total Organic Carbon	2625	U	%				2.3	3	6
Loss On Ignition	2610	U	%				4.6	--	10
Total BTEX	2760	U	mg/kg				< 0.010	6	--
Total PCBs (7 Congeners)	2815	U	mg/kg				< 0.10	1	--
TPH Total WAC (Mineral Oil)	2670	U	mg/kg				44	500	--
Total (Of 17) PAH's	2700	N	mg/kg				39	100	--
pH	2010	U					8.1	--	>6
Acid Neutralisation Capacity	2015	N	mol/kg				0.066	--	To evaluate
Eluate Analysis			2:1 mg/l	8:1 mg/l	2:1 mg/kg	Cumulative mg/kg 10:1	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
Arsenic	1450	U	0.0038	0.0043	< 0.050	< 0.050	0.5	2	25
Barium	1450	U	0.022	0.013	< 0.50	< 0.50	20	100	300
Cadmium	1450	U	< 0.00010	< 0.00010	< 0.010	< 0.010	0.04	1	5
Chromium	1450	U	0.0044	0.0017	< 0.050	< 0.050	0.5	10	70
Copper	1450	U	0.0087	0.0073	< 0.050	< 0.050	2	50	100
Mercury	1450	U	< 0.00050	< 0.00050	< 0.0010	< 0.0050	0.01	0.2	2
Molybdenum	1450	U	0.010	0.0064	< 0.050	0.068	0.5	10	30
Nickel	1450	U	< 0.0010	< 0.0010	< 0.050	< 0.050	0.4	10	40
Lead	1450	U	< 0.0010	0.0016	< 0.010	0.014	0.5	10	50
Antimony	1450	U	0.0042	0.0027	< 0.010	0.029	0.06	0.7	5
Selenium	1450	U	0.0011	< 0.0010	< 0.010	< 0.010	0.1	0.5	7
Zinc	1450	U	< 0.0010	< 0.0010	< 0.50	< 0.50	4	50	200
Chloride	1220	U	4.9	1.5	< 10	19	800	15000	25000
Fluoride	1220	U	0.42	0.34	< 1.0	3.5	10	150	500
Sulphate	1220	U	20	10	40	110	1000	20000	50000
Total Dissolved Solids	1020	N	180	79	360	900	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-
Dissolved Organic Carbon	1610	U	23	11	< 50	120	500	800	1000

Soild Information

Dry mass of test portion/kg	0.175
Moisture (%)	4.7

Leachate Test Information

Leachant volume 1st extract/l	0.341
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.181

Results - 2 Stage WAC

Project: 16.07.021 Land at Lucas Lane, Hitchin, Hertfordshire

Chemtest Job No: 16-19272 Chemtest Sample ID: 336461 Sample Ref: Sample ID: TP08 / HA01 Top Depth(m): 0.20 Bottom Depth(m): 0.60 Sampling Date: 08-Aug-2016							Landfill Waste Acceptance Criteria Limits		
							Inert Waste Landfill	Stable, Non-reactive hazardous waste in non-hazardous Landfill	Hazardous Waste Landfill
Determinand	SOP	Accred.	Units						
Total Organic Carbon	2625	U	%				2.7	3	6
Loss On Ignition	2610	U	%				6.8	--	10
Total BTEX	2760	U	mg/kg				< 0.010	6	--
Total PCBs (7 Congeners)	2815	U	mg/kg				< 0.10	1	--
TPH Total WAC (Mineral Oil)	2670	U	mg/kg				85	500	--
Total (Of 17) PAH's	2700	N	mg/kg				9.8	100	--
pH	2010	U					7.9	--	>6
Acid Neutralisation Capacity	2015	N	mol/kg				0.053	--	To evaluate
Eluate Analysis			2:1 mg/l	8:1 mg/l	2:1 mg/kg	Cumulative mg/kg 10:1	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
Arsenic	1450	U	0.0031	0.0033	< 0.050	< 0.050	0.5	2	25
Barium	1450	U	0.018	0.011	< 0.50	< 0.50	20	100	300
Cadmium	1450	U	< 0.00010	< 0.00010	< 0.010	< 0.010	0.04	1	5
Chromium	1450	U	0.0087	0.0033	< 0.050	< 0.050	0.5	10	70
Copper	1450	U	0.0054	0.0047	< 0.050	< 0.050	2	50	100
Mercury	1450	U	< 0.00050	< 0.00050	< 0.0010	< 0.0050	0.01	0.2	2
Molybdenum	1450	U	0.012	0.010	< 0.050	0.10	0.5	10	30
Nickel	1450	U	0.0012	0.0011	< 0.050	< 0.050	0.4	10	40
Lead	1450	U	< 0.0010	< 0.0010	< 0.010	< 0.010	0.5	10	50
Antimony	1450	U	0.017	0.018	0.034	0.18	0.06	0.7	5
Selenium	1450	U	< 0.0010	< 0.0010	< 0.010	< 0.010	0.1	0.5	7
Zinc	1450	U	0.0026	< 0.0010	< 0.50	< 0.50	4	50	200
Chloride	1220	U	5.7	2.5	11	28	800	15000	25000
Fluoride	1220	U	0.33	0.35	< 1.0	3.5	10	150	500
Sulphate	1220	U	26	14	52	150	1000	20000	50000
Total Dissolved Solids	1020	N	190	76	380	860	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-
Dissolved Organic Carbon	1610	U	25	15	< 50	160	500	800	1000

Soild Information

Dry mass of test portion/kg	0.175
Moisture (%)	8.3

Leachate Test Information

Leachant volume 1st extract/l	0.334
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.159

Report Information

Key

- U UKAS accredited
- M MCERTS and UKAS accredited
- N Unaccredited
- S This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
- SN This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
- T This analysis has been subcontracted to an unaccredited laboratory
- I/S Insufficient Sample
- U/S Unsuitable Sample
- N/E not evaluated
- < "less than"
- > "greater than"

Comments or interpretations are beyond the scope of UKAS accreditation

The results relate only to the items tested

Uncertainty of measurement for the determinands tested are available upon request

None of the results in this report have been recovery corrected

All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis

All Asbestos testing is performed at our Coventry laboratory

Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

- A - Date of sampling not supplied
- B - Sample age exceeds stability time (sampling to extraction)
- C - Sample not received in appropriate containers
- D - Broken Container

Sample Retention and Disposal

All soil samples will be retained for a period of 45 days from the date of receipt

All water samples will be retained for 14 days from the date of receipt

Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:

customerservices@chemtest.co.uk