

SITE INVESTIGATION REPORT

LAND OFF BERRY HILL ROAD, ADDERBURY, BANBURY. OX17 3HF

Prepared for: **Hayfield Homes Construction Ltd and Hollins Strategic Land**

Report Reference: BC592 RE001

31st January 2022



The **Brownfield** Consultancy

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1 INTRODUCTION

The Brownfield Consultancy was instructed by Hayfield Homes Construction Ltd and Hollins Strategic Land to carry out a site investigation at the above site.

It is proposed to construct a number of residential houses at the site with associated infrastructure, including an attenuation basin in the north of the site. Access is to be provided off Berry Hill Road. A proposed layout is included in Appendix A.

Previously, a Desk Study Report was undertaken by Betts Geo Consulting Engineers in July 2017 (Ref:- 17HSL004/DS) and Infiltration Testing was undertaken by Brownfield Solutions (Report Ref: SM/C4304/8800) dated September 2019. We understand that these reports are assigned to Hayfield Homes Construction Ltd. The findings of the Desk Study are discussed in Section 3 and the Infiltration Testing in Section 10.

The purpose of the site investigation is to provide an assessment of the geotechnical engineering properties of the soils and the extent of any soil contamination at the site. The information which is gathered is used to construct a conceptual site model which includes an understanding of potential contaminant sources, pathways and receptors. The Contamination Assessment has been carried out with reference to CLR 11 (Model Procedures for the Management of Land Contamination), as well as Environment Agency Guidance for the Safe Development of Housing on Land Affected by Contamination (R&D Publication 66-2008), BS 10175 (Code of Practice for the Investigation of Potentially Contaminated Sites) and Environment Agency's online Guidance "Land Contamination: Risk Management".

This report is subject to limitations which are set out in Appendix I. This report is provided in the context of the stated development proposals and should not be used in a different context.

2 SITE DESCRIPTION

The site is roughly rectangular in shape, with its long axis north-south and covers an area of approximately 4 hectares. The site is accessed via two metal gates, in the southeast corner, off Berry Hill Road. The majority of the site is undeveloped and consists of a number of agricultural fields separated by electric fencing. The fields are used for horse grazing. A stable area and a riding arena are located along the eastern boundary of site. Areas of localised Made Ground were noted within the stable area.

The topography of the site dips in a northerly direction. Levels along the northern border of site range between 97m AOD – 100m AOD and levels along the southern border of site range between 109m AOD – 100m AOD. There is also a 'v' shaped depression running north-south down the centre of the site, possibly indicative of a dry valley.

Photographs of the site are presented in Appendix G.

3 PREVIOUS WORK

The salient findings of the Betts Geo Desk Study Report are presented below:-

- Geologically, the main development area is underlain by the Marlstone Rock Bed which in turn is underlain by the Dyrham Formation. The Dyrham Formation is shown to outcrop in the far north of the site.
- The Marlstone Rock Bed is classed as a Secondary A Aquifer. Thus groundwater stored in this formation is considered vulnerable to pollution.
- The Marlstone Rock Bed is a metalliferous deposit and is known to contain highly elevated concentrations of metals, for example arsenic.
- The site is within a high probability radon area as greater than 30% of properties are above the action level. Full radon protective measures may be necessary in the construction of new dwellings or extensions.
- The nearest controlled surface water is an unnamed drain located 66m North. This drain leads into the Sor Brook.
- The site has remained undeveloped until circa 2006, when a path/road and horse stables are shown on the eastern boundary of the site. The surrounding area has a history of allotments immediately east and west and 30m south between circa 1900/1922 – 1977, a gas works 20m south west between circa 1922 – 1977 and a sewage works 20m north between circa 1922 – 1999. Residential development began to the southwest circa 1977.
- Potential sources of ‘on-site’ soil contamination include Made Ground associated with the Stable Block and potentially elevated concentrations of metalliferous contaminants associated with the local geology. Potential sources of ‘off-site’ soil contamination include the Gas Works 20m SW and the Sewage Works 20m N.
- There are no waste management facilities or landfill sites within 250m of the site. BettsGeo concluded that possible sources of ground gas include the Gas Works 20m SW and the Sewage Works 20m N. There are also two potentially infilled land entries located 96m S and 116m SE.

4 FIELDWORK

The fieldwork was carried out on 20th and 21st December 2021 and comprised five dynamic sampler boreholes, ten dynamic probes, five hand-excavated pits and two soil infiltration tests in pits.

The site work was undertaken under the supervision of The Brownfield Consultancy, with the ground investigation procedures and sample descriptions based on BS 5930 (2020) ‘Code of Practice for Site Investigations’ and BS 10175:2011+A2:2017 “Investigation of potentially contaminated sites - code of practice”. The locations of the exploratory holes are shown on the Drawing included in Appendix A. The full details of the fieldwork undertaken are summarised in the following sections.

4.1 Dynamic Sampler Boreholes

The boreholes, designated WS1 to WS5, were advanced to depths of 3.80m to 4.45m below existing ground level. The windowless sampling technique utilises a lightweight tracked rig to advance the borehole in 1m stages using 1m long steel sampler tubes containing plastic liners, into which the substrata deposits are driven, at diameters of 100mm reducing to 70mm. The soils are then recovered from each sampler tube as continuous core samples, which are then

logged and sub-sampled on site. Standard Penetration Tests (SPTs) were undertaken in accordance with BS EN ISO 22476-3:2005+A1:2011 at approximately 1.0m intervals.

Standpipes were installed in boreholes WS1, WS2 and WS3 to facilitate ongoing monitoring of the groundwater and ground-borne gases. The standpipe response zones were from 1m to the base of the borehole.

4.2 Dynamic Probes

The dynamic probes, DP1 to DP10 were advanced to depths of 2.20m to 7.00m, many being terminated upon refusal. The purpose of the probing was to provide additional numerical data on ground strength and highlight any excessively compressible/low density zones.

The super-heavy dynamic probe test (DPSH) used, comprises a 63.5kg weight falling through a constant drop of 760mm, driving a solid 51mm diameter steel cone of 90° angle into the deposits under test. The relative density of the deposit is determined by recording the number of blows per 100mm of penetration. The probe provides a continuous profile of the relative density of the soils and the energy and dynamics of the test are similar to that of the Standard Penetration Test (SPT) undertaken in the boreholes. Refusal is defined as a blow-count of greater than thirty for a single 100mm increment of penetration.

4.3 Hand-excavated Pits

6No. hand dug pits were excavated using hand tools around the main Stable Block buildings (HP1, HP2 and HP3), the Riding Arena (HP4), a small bund located immediately south of the Riding Arena (HP5) and within the road construction (HP6). The pits were excavated to depths of 0.60m to 1.00m proving virgin Marlstone Rock Bed at each location with the exception of HP5. The bund was investigated on the second day of fieldwork using the excavator.

Photographs of the pit locations are presented in Appendix G

4.4 Soakaway Tests

Two pits, designated SA1 and SA2, were excavated for the purposes of conducting soil infiltration tests to obtain parameters for soakaway design. The pit dimensions were accurately measured, then rapidly filled with water from a mobile bowser and the time taken for the water to drain recorded in increments in accordance with the methods of BRE 365 "Soakaway Design". The results of the tests are presented in Appendix E.

5 LABORATORY TESTING

5.1 Geotechnical

A programme of laboratory testing was scheduled to determine the geotechnical and geochemical properties of selected soil samples obtained from the investigation. The details of the geotechnical testing are summarised below:-

Table 1 Summary of Geotechnical Laboratory Testing Suites

Determinant	No
BRE SD1 Suite B (sulphate, pH etc.)	6
Atterberg limits including moisture content	6
Particle Size Distribution (sieve only)	2

The tests were carried out in accordance with BS1377 (1990) “Methods of test for Soils for Civil Engineering purposes” and Building Research Establishment Special Digest 1 “Concrete in Aggressive Ground”. The results of the testing are presented in Appendix C.

5.2 Environmental

A programme of chemical laboratory testing was scheduled on 19No. soil samples taken from near surface soils recovered from the exploratory holes. The samples were placed into suitable containers for the required chemical analysis.

All samples were transported to I2 in Watford which is accredited under UKAS and MCerts. The following table summarises the contaminants scheduled:-

Summary of Soil Chemical Laboratory Testing Suites

Determinant	No
Extended Metals Suite	13
Speciated polycyclic aromatic hydrocarbons (PAH)	6
Asbestos	8
TPH Texas Banded	3
Physiologically Based Extractive Testing (PBET)	2
Waste Acceptance Criteria (WAC)	1

The results of the laboratory chemical testing are presented in full in Appendix D.

6 GROUND AND GROUNDWATER CONDITIONS

6.1 Strata Encountered

According to BGS online mapping, the site is underlain by the Marlstone Rock Formation, described as ferruginous limestone and ironstone. Although the exploratory holes confirmed the presence of Marlstone Rock beds, their composition was highly variable.

A summary of the strata encountered is set out in the following sections, but for full details and descriptions, reference should be made to the exploratory hole records presented in Appendix B.

6.2 Topsoil

With the exception of the hand dug pits (HP), topsoil was encountered in all the exploratory holes and mainly consisted of slightly clayey, slightly gravelly sand. Thicknesses of 0.10m to 0.50m were encountered.

6.3 Made Ground

Made Ground was encountered in the hand excavated pits only.

In HP1-HP3 (Stable Block), a thin layer (0.10-0.20m) of black sandy gravel, dominated by tarmac was encountered. Larger boulder sized tarmac and paving slab were also encountered.

HP4 in the riding arena proved 0.10 of sand over a geotextile over 0.16m of medium and coarse gravel of limestone. HP5 was located in the small bund south of the Riding Arena and 0.80m of reworked Marlstone Rock Bed was recorded. A return visit to the bund with the

excavator proved this deposit to the top of the Marlstone Rock Bed. The origin of the bund is the 0.26m scrape of virgin soil from the Riding Arena.

HP6 in the entrance road encountered a 0.14m layer of black sandy gravel again dominated by tarmac overlying a 0.08m layer of red brick and limestone gravel.

6.4 Marlstone Rock Formation

The Marlstone Rock was found as a seemingly random succession of deposits of variable composition, although the upper layer was generally a firm, variably sandy and variably gravelly clay, but this was not the case at all locations.

Many beds consisted of variably clayey and variably sandy limestone gravel. However, in some cases, the gravel was a result of the drilling process breaking up partially intact limestone beds.

Further layers of firm or soft, sandy gravelly clays were encountered, as were deposits of gravelly fine sand. At depths of 2.40m to 3.60m in four of the boreholes, firm or stiff silt/fine sand was encountered. It is not certain that the latter are actually of the Marlstone Rock formation.

At most locations, SPTs and dynamic probes indicated the upper 2.00m to 3.00m of the deposits to be loose/low strength, and occasionally at greater depth.

The Atterberg Limits of six samples of the fine-grained/cohesive beds of the Marlstone Rock Formation were determined which indicated it to be a clays or silts of medium or high plasticity (BS1377). After modification of the Plasticity Indices to account for the proportion of the samples retained on the 425µm sieve, the NHBC Chapter 4.2 volume-change potential (VCP) classifications were *low* or *medium*.

6.5 Groundwater

Groundwater was not observed in the exploratory holes during drilling, other than a seepage at 2.00m in WS2. Monitoring of the standpipes installed to 4m depth in WS1, WS2 and WS3 also indicated dry conditions.

6.6 Contamination

Visual and/or olfactory evidence of contamination was not recorded in any of the exploratory hole locations.

7 HUMAN HEALTH QUANTITATIVE RISK ASSESSMENT

Qualitative assessment of risks may be sufficient in many cases to eliminate the possibility of significant pollutant linkages. However, quantitative risk assessment is formally required to determine whether there is a 'significant possibility of significant harm being caused'. Part IIA of the Environmental Protection Act 1990 recommends that 'authoritative and scientifically based guideline values for concentrations of the potential pollutants in or under the land' be used to quantify the risk posed by contamination.

Under the Planning Regime a quantitative risk assessment can be used to decide whether the site is suitable for the proposed use. In addition, the National Planning Policy Framework (March 2012) also indicates that after remediation as a minimum land should not be capable of being determined as contaminated land under Part IIA.

7.1 Current UK Screening Values

The UK technical guidance for assessing risks to human health is issued from various UK bodies including the Environment Agency (EA), DEFRA, Contaminated Land: Applications in Real Environment (CL:AIRE), Chartered Institute of Environmental Health (CIEH) and Land Quality Management (LQM) Ltd (part of the University of Nottingham).

New and updated screening values in the form of provisional Category four Screening Levels (C4SL) (published in 2014) and Suitable for Use Levels (S4UL) (published 2015) have been produced by defra and CIEH / LQM respectively using modified versions of the EA's Contaminated Land Exposure Assessment (CLEA) software.

7.2 C4SL

Provisional C4SL have been derived by CL:AIRE following guidance and as a tool to assist in applying the Part IIA Category 1- 4 classifications to a site. The purpose of the C4SL is to provide a simple test for deciding that land is suitable for use and 'definitely not' contaminated land under Part IIA. They describe a level of risk that is above minimal but is still low.

Six contaminants have been assigned provisional C4SL: arsenic; benzene; benzo[a]pyrene; cadmium; chromium VI and lead for the standard land uses (residential with and without plant uptake, allotments, commercial and public open space (parks and residential)).

The C4SL are also considered suitable to be used under the planning regime.

7.3 S4UL

The LQM / CIEH S4UL represent generic assessment criteria based on minimal or tolerable risk that are intended to be protective of human health. They represent values above which further assessment of the risks or remedial actions may be needed.

S4UL have been derived for a comprehensive list of organic and inorganic determinants.

8 SOIL CHEMISTRY

8.1 Results

The results of chemical testing of 19No. samples of near surface soils are compared with the S4UL and C4SL for a residential with plant uptake end use. These comparisons are summarised in the following table. Exceedances of the relevant guideline value are highlighted in bold:-

Comparison of Soil Chemical Test Results with Guideline Values

Determinant	Maximum Measured Concentration (mg/kg)	LQM/CIEH S4UL Residential with Plant Uptake (mg/kg)	No. of tests carried out	No. of exceedances
Arsenic	280	37	13	11
Cadmium	<dl	11	13	0
Chromium (total)	630	910	13	0
Mercury	<dl	1.2	13	0
Lead	75	200	13	0
Nickel	170	180	13	0
Selenium	<dl	250	13	0
Copper	29	2400	13	0
Zinc	240	3700	13	0
Naphthalene	<dl	2.3	6	0
Acenaphthylene	<dl	170	6	0
Acenaphthene	<dl	210	6	0
Fluorene	<dl	170	6	0
Phenanthrene	<dl	95	6	0
Anthracene	<dl	2400	6	0
Fluoranthene	<dl	280	6	0
Pyrene	<dl	620	6	0
Benzo(a)anthracene	<dl	7.2	6	0
Chrysene	<dl	15	6	0
Benzo(b)fluoranthene	<dl	2.6	6	0
Benzo(k)fluoranthene	<dl	77	6	0
Benzo(a)pyrene	<dl	2.2	6	0
Indeno(1,2,3-c,d)pyrene	<dl	27	6	0
Dibenzo(a,h)anthracene	<dl	0.24	6	0
Benzo(ghi)perylene	<dl	320	6	0

8.2 Interpretation – Metals and PAH

With the exception of arsenic, the results did not record exceedances of the guideline values for metal or for polycyclic aromatic hydrocarbons determinants. Concentration exceedances for arsenic were reported in 11 out of the 13 samples analysed. Those locations that recorded arsenic below the guideline value were from HP4 at 0.05m (imported sand in the Riding Arena) and HP6 at 0.05m (road construction). A wide spectrum of concentrations ranging from 81mg/kg to 280mg/kg with an arithmetic mean of 155mg/kg were recorded.

As discussed in Section 3, the source of the arsenic is the metalliferous Marlstone Rock Formation.

The most widely used and well-established laboratory test to assess the bio-accessibility of arsenic contaminants is PBET analysis (physiologically based extraction technique). The test mimics the conditions in the human intestine and stomach and gives results for the relative bio-accessibility of, in this instance, arsenic, as a percentage. The percentage can then be used with a risk assessment tool such as CLEA (v1.07) to calculate a site-specific assessment criteria (SSAC).

Two tests were undertaken on WS1 (0.15m) and WS4 (0.50m) which recorded arsenic concentrations of 100mg/kg and 210mg/kg respectively. The results reported bio-accessible fractions of 16.1% and 7.1%.

The CLEA worksheet showing the calculation is included within Appendix C, which uses the site-specific bio-accessibility of 11.6% rather than the default value of 100% which gives the current SGV of 37mg/kg. In terms of the worksheet, only the relative bioavailability via soil ingestion was altered, as the contribution from the inhalation pathways for residential end use only accounts for 0.3% of the exposure pathway.

Using this site-specific data for bio-accessibility, a SSAC of 159mg/kg is calculated, which exceeds the arithmetic mean for the site (155mg/kg) but is below the concentrations recorded in only the following four locations:-

WS2 (1.00m)	120mg/kg
WS2 (1.50m)	280mg/kg
WS4 (0.50m)	220mg/kg
WS5 (0.10m)	180mg/kg

It must be borne in mind that the concentrations in WS2 are not considered applicable to the exercise due to their depth below ground level.

On this basis, the arsenic concentrations reported in the soils analysed, which are considered of natural source rather than of anthropogenic, are not considered a risk to human health.

8.3 Hydrocarbons

Visual and olfactory evidence of hydrocarbon contamination was not recorded during the field investigation.

There is little merit in scheduling Made Ground containing tarmac for extensive hydrocarbon testing because tarmac is known to contain elevated concentrations of semi-volatile and heavy end aliphatic / aromatic hydrocarbons.

Betts Geo identified a former Gas Works immediately adjacent to the south west boundary. Thus hydrocarbon analysis was conducted on soils from WS2 at 1.00m which was located within 3m of the southwest boundary to determine whether coal tars (or similar) had migrated onto the subject site. The sample was scheduled for 16 PAH and TPH Texas Banded and concentrations were not recorded above the laboratory limit of detection.

Hydrocarbon analysis was also scheduled on soils to determine water pipework selection. This is discussed in Section 12.3.

8.4 Asbestos

The Made Ground encountered in and around the Stable Block and the materials that make up the existing road construction are all considered to be suitable for re-use providing that they are free from asbestos. 8No. samples of granular materials, collected from HP1-HP6, were submitted to an asbestos screen and asbestos was not recorded.

8.5 Waste Classification and Soil Re-Use

Made Ground at the site is considered suitable for re-use under hard surfacings.

Foundation arisings will consist entirely of weathered Marlstone Rock Bed. With regard to the European Waste Catalogue Code 17 05 04 'Stone and soils from uncontaminated sites' should be classified as inert. No evidence of anthropogenic contamination has been identified in the natural soils, therefore in our opinion the Marlstone deposits from this site may be classified as such.

Waste Acceptance Criteria analysis was undertaken on a sample of Marlstone Rock Bed from WS2 at 1.00m bgl. The results of this test indicate that virgin soils of the Marlstone Rock Bed will be classified as Inert Waste. An elevated Loss on Ignition value of 10.2% was recorded. However this can be discounted as the TOC value is <6%.

It must be noted that the soils record elevated concentrations of arsenic. Specific landfill sites may have limiting values of these metals within their environmental permit. Thus we would recommend that this report is submitted to landfill operators for their consultation on waste acceptability prior to costs being assigned to off-site disposal.

9 GEOTECHNICAL ENGINEERING ASSESSMENT

9.1 Proposed Redevelopment

The proposed development is an estate of low-rise housing. The proposed layout is included in Appendix A.

9.2 Summary of Ground Conditions

The exploratory holes revealed the site to be underlain by multi-layered deposits of the Marlstone Rock Formation. These consisted of a generally random succession of firm or soft sandy gravelly clays, clayey sandy gravels and gravelly sands. Firm or stiff silt/fine sand was found at depth at many locations, possibly of different geological origin. The deposits were generally loose/low strength to depths of 2m to 3m, and occasionally at greater depths.

Groundwater was not observed in the exploratory holes during drilling, other than a seepage at 2.00m in WS2. Monitoring of the standpipes installed to 4m depth in WS1, WS2 and WS3 also indicated dry conditions.

9.3 Foundations

Spread foundations bearing in the Marlstone Rock Formation are not recommended unless ground improvement is undertaken. The soils down to 2m to 3m depth are generally loose/low strength and are also of variable composition and are, therefore, susceptible to excessive total and differential settlement under building foundation loads. It is recognised that there may be locations where this is not the case, but it would be necessary to carry out detailed investigation of individual plots, often at close spacings along each building line, to ensure that ground of adequate strength is present beneath the entire building as the soils are variable over short lateral distances.

It is recommended that vibro-replacement (vibrated stone or concrete columns) is considered for ground improvement, which would enable foundations to be placed at 'conventional' depths and be designed assuming a relatively high allowable bearing capacity. Obviously,

piling is also an option but is unlikely to be economically advantageous over vibro and would require additional and deeper ground investigation. For either option, it is recommended that specialist contractors are consulted as to the suitability and efficiency of their particular systems in these ground conditions. Attention is drawn to the occasional zones of 'hard drilling' that may be a hindrance to some techniques.

The currently proposed site layout would appear to place the buildings sufficiently distant from any trees. The presence of soils of VCP should not be an issue, therefore.

9.4 Ground Floor Slabs

Given the low strength of the near-surface deposits, it is recommended that ground floors are fully suspended on the foundations. As there are no issues relating to the presence of trees and VCP soil, there are no specific requirements regarding the dimension of the under-slab void.

9.5 Excavations

Shallow excavations should remain stable in the short term and groundwater does not appear to be present at shallow depth. However, caution should be exercised when operating machinery in close proximity to open excavations as the vibrations may further loosen the granular beds. As with all sites, where personnel are required to enter excavations of 1.2m depth or greater, or excavations of any depth that are exhibiting instability, shoring or battering back of the sides should be undertaken.

9.6 Chemical Considerations for Buried Concrete

Chemical testing on six soil samples in accordance with BRE SD1 (2005) "Concrete in aggressive ground", indicated water-soluble sulphate concentrations (SO₄ in 2:1 soil aqueous extract) of 10g/l to 43mg/l, and pH values of 6.5 to 7.6. These values, along with a static groundwater regime, place the site in design sulphate class **DS-1** and Aggressive Chemical Environment for Concrete (ACEC) class **AC 1s**. Calculation of the oxidisable sulphides (OS) from the total sulphate and total sulphur results using the method of the digest does not indicate a significant presence of pyrite in the samples. No adjustment to the classifications is required, therefore.

No special precautions are required to protect buried concrete from ground-borne chemical attack.

9.7 Road Pavement Design

A CBR value of 1.5% is considered appropriate for the design of pavements formed in the near-surface deposits of the Marlstone Rock Formation. It is also recommended that the formation is proof-rolled to highlight any excessively compressible zones that may require additional treatment. This may be a conservative figure for areas where the shallow deposits are formed from predominantly granular soils, but their presence at shallow depth appears to be very localised and impractical to delineate.

10 SOAKAWAY DRAINAGE

Infiltration Testing was undertaken by Brownfield Solutions (Report Ref: SM/C4304/8800) dated September 2019. Three trial pit soakaway tests were performed denoted SA101, SA102 and SA103. The following conclusions were made:-

The tests in SA101 and SA103 were able to be repeated three times with infiltration rates ranging between 1.30×10^{-4} m/s to 1.68×10^{-4} m/s, indicating good drainage conditions and compliance with BRE 365. In contrast, poor infiltration was recorded in SA102.

It is noted that both SA101 and SA103 were completed in the southern half of the site at a higher elevation to SA102, which was completed in a depression in the north of the site. It was also noted that there was an increase in gravel content with depth in SA103 and SA101, compared to SA102 which contained rare gravel fragments. The difference in infiltration rates may be at least partially accounted for by difference in gravel content and location on the site.

The Brownfield Consultancy conducted BRE 365 compliant trial pit soakaway tests at locations SA1 and SA2. SA1 was located in the southeast where good infiltration was expected, and SA2 located in the 'depression' (Brownfield Solutions SA102).

In accordance with the digest, three repeat tests were successfully undertaken in SA1. The following soil infiltration rates were obtained:

SA1 2.8×10^{-4} m/s, 1.8×10^{-4} m/s, 1.4×10^{-4} m/s.

Similar results were recorded by Brownfield Solutions.

The test in SA2 was not successful.

The results are presented in Appendix E.

11 GAS PROTECTION REQUIREMENTS

11.1 Ground Gas Monitoring

The Conceptual Site Model identified no waste management facilities or landfill sites within 250m of the site. Betts Geo concluded that possible sources of ground gas include the Gas Works 20m SW and the Sewage Works 20m N. There are also two potentially infilled land entries located 96m S and 116m SE. The risks from these sources are considered to be 'low' however. It was decided therefore that 3No. gas monitoring visits would be undertaken initially, with a view to undertaking further visits if elevated or fluctuating gas concentrations were recorded.

Gas monitoring was undertaken from WS1, WS2 and WS3 on 2nd January, 10th January and 23rd January at atmospheric pressures ranging from 997mb to 1022mb.

11.2 Interpretation of Results

The current guidance on protecting buildings from ground gas hazards is contained in the document CIRIA C665 with updated risk assessment guidance contained within BS8485 (2015).

The level of gas protection is determined by comparing the following parameters to cut-off values prescribed within BS8485 (2015):-

- "Typical Maximum Concentrations" for initial screening purposes.
- Risk based "Gas Screening Values" (GSV) for consideration where the typical maximum concentrations are exceeded.

The GSV is calculated using the following equation and the resulting GSV are compared to the Site Characteristic GSV given in Table 2 of BS8485 (2015).

Maximum gas concentration (%) x worst case borehole flow rate (l/h)

Methane was not recorded during the three visits. The maximum CO₂ concentrations, the maximum flow rate and the screening values for each borehole are summarised in the following table:-

Calculated GSV

Location	Maximum CO ₂ Concentration (% v/v)	Maximum Flow Rate (l/hr)	Gas Screening Value (l/hr)
WS1	2.1	0.1	0.0021
WS2	2.0	0.1	0.0020
WS3	0.7	0.1	0.0007

The ground investigation has identified a maximum carbon dioxide concentration of 2.1% vol. and a worst case flow rate of <0.1 l/hr, giving a maximum GSV of 0.0021 l/h. These values are then compared to Table 2 within BS8485 (2015).

11.3 Interpretation

Referring to Table 2 of BS8485 (2015), the site can be categorised as a Characteristic Situation 1 (CS1). Gas protection measures are not required. The results indicate that further gas monitoring visits are not necessary.

The gas monitoring records are presented in Appendix F.

12 CONCLUSIONS AND RECOMMENDATIONS

12.1 Contamination and Remediation

Laboratory analysis of soil has determined that remediation is not required. Arsenic concentrations are elevated in the soils analysed. However these are considered of natural source rather than of anthropogenic, are not considered a risk to human health. The reader is referred to Section 8.2.

A thin layer of granular Made Ground is present along the access road and in proximity to the Stable Block. This material is acceptable for re-use below future hard surfacings. Oversized objects will need to be removed.

It is possible that additional hotspots of contamination may be encountered during groundworks. The principal contractor should contact The Brownfield Consultancy who will attend site and advise on the best course of action in consultation with the local planning authority.

12.2 Gas Protection Measures

3No. gas monitoring visits have been undertaken at the site and gas protection measures are not required. The Desk Study by Betts Geo identified that the site is within a high probability radon area as greater than 30% of properties are above the action level. Full radon protective measures may be necessary in the construction of new dwellings or extensions.

12.3 Buried Services

Laboratory trials have determined that high concentrations of organic contaminants such as hydrocarbons and volatile organic compounds can degrade plastic water supply pipework. The Desk Study confirms that the site has not had a previous contaminative land use. Samples of soil from WS1 (0.90m), WS2 (1.00m), WS3 (0.90m) and WS4 (0.560m) were submitted to hydrocarbon analysis (TPH Texas Banded and 16 USEPA PAH) and concentrations were not recorded above the laboratory limit of detection.

Hence standard pipework is considered suitable for this development.

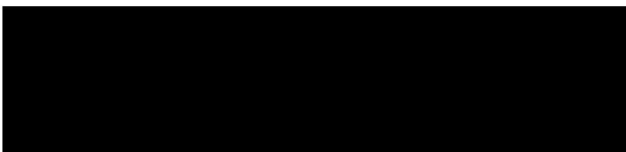
12.4 Soakaways

Infiltration is considered feasible in the south of the site. The reader is referred to Section 10.

12.5 Geotechnical

The reader is referred to Section 9 where the geotechnical conclusions are presented in full.

Prepared and approved by



JIM TWADDLE BSc (Hons) CGeol FGS
Director

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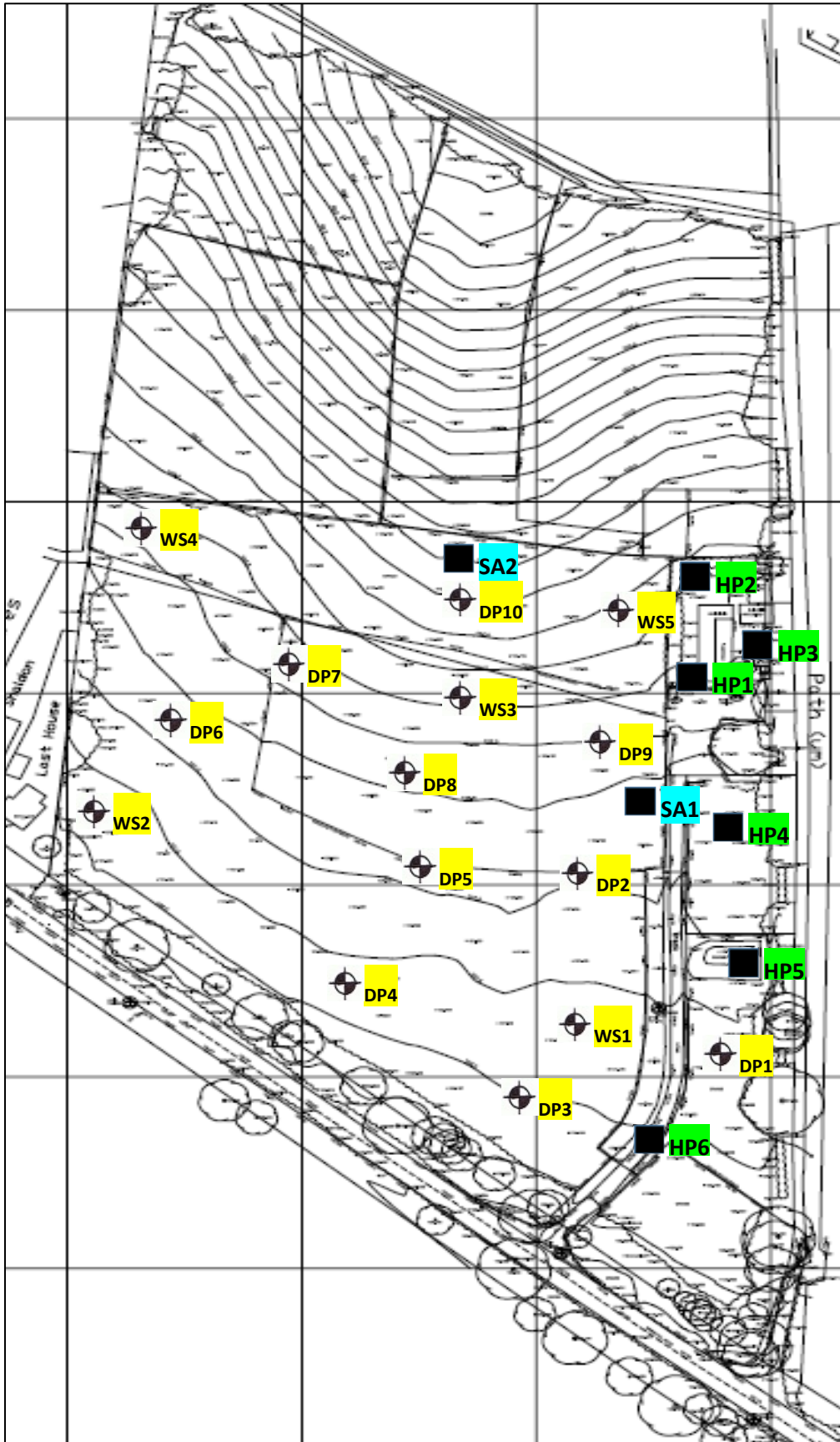
APPENDIX A

Exploratory Hole Location Plan

Site Proposals

BERRY HILL ROAD, ADDERBURY. OX17 3HF

Investigation Locations



BERRY HILL ROAD, ADDERBURY. OX17 3HF


















APPENDIX B

Exploratory Hole Logs

BOREHOLE LOG

Project Berry Hill Road, Adderbury.				BOREHOLE No WS1	
Job No BC592	Date 20-12-21	Ground Level (m)	Co-Ordinates () E 46,964.0 N 34,777.0		
Contractor The Brownfield Consultancy Ltd				Sheet 1 of 1	

SAMPLES & TESTS			STRATA					Geology	Instrument/ Backfill
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	DESCRIPTION		
0.15	ES					0.20	Brown slightly clayey slightly gravelly SAND. Gravel is angular and subangular fine and medium occasionally coarse limestone. (TOPSOIL)		
						(0.80)	Firm brown slightly sandy slightly gravelly CLAY. Gravel is angular and subangular fine to coarse limestone. (MARLSTONE ROCK BED)		
0.90	ES					1.00			
1.00	B								
1.00	D	N10 2,3/ 2,2,3,3				(0.60)	Loose brown sandy very clayey GRAVEL of angular and subangular fine to coarse limestone. (MARLSTONE ROCK BED)		
						1.60			
						1.80	Loose brown angular coarse GRAVEL and COBBLE of limestone. (MARLSTONE ROCK BED)		
2.00	D	N14 2,2/ 3,3,5,3				(0.70)	Medium dense brown sandy very clayey GRAVEL of angular and subangular fine to coarse limestone. (MARLSTONE ROCK BED)		
2.00						2.50			
						(0.50)	Brown fine SAND with shell fragments and rare medium angular gravel of limestone. Locally weakly cemented. (MARLSTONE ROCK BED)		
3.00	D	N6 2,1/ 1,1,2,2				3.00			
3.00						(0.60)	Soft brown sandy gravelly CLAY. Gravel is angular and subangular fine to coarse limestone. (MARLSTONE ROCK BED)		
						3.60			
4.00	D	N49 6,9/ 10,11,12,16				(0.85)	Very stiff brown and greenish grey well cemented SILT / fine SAND. (MARLSTONE ROCK BED ?)		
4.00						4.45			
							Groundwater not encountered.		

BROWNFIELD DS LOG ADDERBURY LOGS G.P.U. GINT STD AGS 3.1.GDT 31/1/22

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	

All dimensions in metres Scale 1:31.25	Client Hayfield Homes Ltd	Method/ Plant Used Dynamic Sampling Rig	Logged By JT
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Project Berry Hill Road, Adderbury.				BOREHOLE No WS2	
Job No BC592	Date 20-12-21	Ground Level (m)	Co-Ordinates () E 46,859.0 N 34,836.0		
Contractor The Brownfield Consultancy Ltd				Sheet 1 of 1	

SAMPLES & TESTS			STRATA				Geology	Instrument/ Backfill	
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thick-ness)			DESCRIPTION
0.20	HV	50kPa	↓			0.10	Brown slightly clayey slightly gravelly SAND. Gravel is angular and subangular fine and medium occasionally coarse limestone. (TOPSOIL)		
0.45	HV	90kPa		(0.90)				Firm brown sandy gravelly CLAY. Gravel is angular and subangular fine to coarse limestone. Locally gravel predominant. (MARLSTONE ROCK BED)	
0.70	D								
1.00	ES						1.00		
1.00		N9 2,1/ 1,2,3,3						Loose becoming medium dense brown sandy clayey locally very clayey GRAVEL of angular and subangular fine to coarse limestone. Occasional cobble of limestone. (MARLSTONE ROCK BED)	
1.50	ES						(1.50)		
2.00	ES						2.00	2.00 Seepage.	
2.00		N15 2,2/ 2,4,5,4					2.50		
3.00		N18 5,5/ 6,6,3,3					(0.50)	Firm brown and greenish grey well cemented SILT / fine SAND. (MARLSTONE ROCK BED)	
3.00							3.00		
3.00						(0.70)	Medium dense brown slightly sandy clayey locally very clayey GRAVEL of angular and subangular fine to coarse limestone. Occasional cobble of limestone. (MARLSTONE ROCK BED)		
3.00						3.70	3.00 - 3.80 Very hard drilling. Refusal at 3.80m. CPT driven.		
3.80		N67/135mm 22,45				3.80	Cobble of pale blue LIMESTONE. (MARLSTONE ROCK BED)		
3.80							Borehole dry on completion.		

BROWNFIELD DS LOG ADDERBURY LOGS G.P.U. GINT STD AGS 3.1.GDT 31/1/22

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	

All dimensions in metres Scale 1:31.25	Client Hayfield Homes Ltd	Method/ Plant Used Dynamic Sampling Rig	Logged By JT
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BOREHOLE LOG

Project Berry Hill Road, Adderbury.				BOREHOLE No WS3	
Job No BC592	Date 20-12-21	Ground Level (m)	Co-Ordinates () E 46,921.0 N 34,864.0		
Contractor The Brownfield Consultancy Ltd				Sheet 1 of 1	

SAMPLES & TESTS			STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thick-ness)		
0.30	ES					0.10	Brown slightly clayey slightly gravelly SAND. Gravel is angular and subangular fine and medium occasionally coarse limestone. (TOPSOIL)	
0.80	D					(1.50)	Initially firm becoming soft at 0.80m brown sandy gravelly CLAY. Gravel is angular and subangular fine to coarse limestone. (MARLSTONE ROCK BED)	
0.90	ES							
1.00	D							
1.00		N7 2,1/ 2,2,1,2				1.60		
2.00	D					(0.80)	Firm brown slightly gravelly sandy CLAY. Gravel is angular and subangular fine and medium occasionally coarse limestone. Abundant shell fragments. (MARLSTONE ROCK BED)	
2.00		N11 1,1/ 2,3,3,3				2.40		
3.00	ES					(0.60)	Firm brown and greenish grey SILT / fine SAND. Locally well cemented. (MARLSTONE ROCK BED ?)	
3.00		N16 3,4/ 3,4,4,5				3.00		
4.00		N24 6,5/ 5,6,6,7				(1.45)	Stiff fissured brown and greenish grey SILT / fine SAND. Ochre staining along fissure surfaces. Locally very weakly cemented. (MARLSTONE ROCK BED ?) 3.00 - 4.00 Very difficult drilling.	
						4.45		
							Groundwater not encountered.	

BROWNFIELD DS LOG ADDERBURY LOGS G.P.U. GINT STD AGS 3.1.GDT 31/1/22

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	

All dimensions in metres Scale 1:31.25	Client Hayfield Homes Ltd	Method/ Plant Used Dynamic Sampling Rig	Logged By JT
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BOREHOLE LOG

Project Berry Hill Road, Adderbury.				BOREHOLE No WS4	
Job No BC592	Date 20-12-21	Ground Level (m)	Co-Ordinates () E 46,866.0 N 34,904.0		
Contractor The Brownfield Consultancy Ltd				Sheet 1 of 1	

SAMPLES & TESTS			STRATA					Geology	Instrument/ Backfill
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	DESCRIPTION		
0.10	ES					(0.30) 0.30	Brown SAND with rare gravel of angular and subangular fine and medium occasionally coarse limestone. (TOPSOIL)		
0.50	0.5					0.50	Firm brown slightly gravelly very sandy CLAY. Gravel is angular and subangular fine to coarse limestone. (MARLSTONE ROCK BED)		
1.00		N12 3,3/ 4,4,2,2				(0.80) 1.30	Medium dense brown clayey sandy angular and subangular medium to coarse GRAVEL of limestone. Medium cobble content. (MARLSTONE ROCK BED)		
1.80	ES					(0.70) 2.00	Medium dense brown sandy clayey locally very clayey angular and subangular medium to coarse GRAVEL of limestone. Medium cobble content. (MARLSTONE ROCK BED)		
2.00	D	N20 4,4/ 5,5,5,5				(0.90) 2.90	Medium dense brown clayey sandy angular and subangular medium to coarse GRAVEL of limestone. Medium cobble content. (MARLSTONE ROCK BED)		
3.00		N25 5,5/ 6,9,5,5				(0.50) 3.40	Medium dense brown sandy clayey locally very clayey angular and subangular medium to coarse GRAVEL of limestone. Medium cobble content. (MARLSTONE ROCK BED)		
4.00		N20 3,3/ 5,5,5,5				(1.05) 4.45	Stiff brown and greenish grey SILT / fine SAND. Locally well cemented. (MARLSTONE ROCK BED ?)		
							Groundwater not encountered.		

BROWNFIELD DS LOG ADDERBURY LOGS GFIJ GINT STD AGS 3.1.GDT 31/1/22

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	

All dimensions in metres Scale 1:31.25	Client Hayfield Homes Ltd	Method/ Plant Used Dynamic Sampling Rig	Logged By JT
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BOREHOLE LOG

Project Berry Hill Road, Adderbury.				BOREHOLE No WS5	
Job No BC592	Date 20-12-21	Ground Level (m)	Co-Ordinates () E 46,971.0 N 34,876.0		
Contractor The Brownfield Consultancy Ltd				Sheet 1 of 1	



SAMPLES & TESTS			STRATA					Geology	Instrument/ Backfill
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	DESCRIPTION		
0.10	ES					(0.40)	Soft brown sandy gravelly CLAY with rootlets. Gravel is angular and subangular fine and medium occasionally coarse limestone. (TOPSOIL)		
0.40	ES					(0.40)	Brown slightly clayey slightly sandy angular and subangular medium to coarse GRAVEL of limestone. Medium cobble content. (MARLSTONE ROCK BED)		
0.80	D					0.80	Firm brown sandy very gravelly CLAY. Gravel is angular and subangular fine to coarse limestone. (MARLSTONE ROCK BED)		
1.00	B	N10 4,2/ 2,3,2,3				1.00	Loose brown slightly clayey slightly sandy angular and subangular medium to coarse GRAVEL of limestone. Medium cobble content. (MARLSTONE ROCK BED)		
2.00		N8 1,1/ 1,3,1,3				2.00			
2.40	D					(0.40)	Soft brown sandy gravelly CLAY. Gravel is angular and subangular fine to coarse limestone. (MARLSTONE ROCK BED)		
2.90		N44 5,9/ 9,11,11,13				2.40			
3.50		N50 4,8/ 9,11,11,19				2.90	Stiff becoming very stiff fissured brown and greenish grey SILT / fine SAND. Ochre staining along fissure surfaces. Locally very weakly cemented becoming increasingly cemented with depth. (MARLSTONE ROCK BED ?) 2.50 - 3.90 Hard drilling.		
						3.50			
						3.95	Groundwater not encountered.		

BROWNFIELD DS LOG ADDERBURY LOGS G.P.U. GINT STD AGS 3.1.GDT 31/1/22

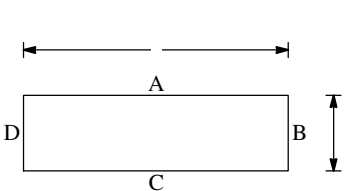
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Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	

All dimensions in metres Scale 1:31.25	Client Hayfield Homes Ltd	Method/ Plant Used Dynamic Sampling Rig	Logged By JT
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Project Berry Hill Road, Adderbury.				TRIAL PIT No HP1
Job No BC592	Date 20-12-21	Ground Level (m)	Co-Ordinates ()	
Contractor The Brownfield Consultancy Ltd				Sheet 1 of 1

STRATA		SAMPLES & TESTS			
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.20		Black sandy GRAVEL of angular to subrounded fine to coarse tarmac and some unknown lithologies. One boulder of tarmac. (MADE GROUND)	0.10	ES	
0.20-0.90		Firm brown slightly sandy slightly gravelly CLAY. Gravel is angular and subangular fine to coarse limestone. (MARLSTONE ROCK BED)			
0.90		Pit terminated at target depth.			

BROWNFIELD TP ADDERBURY LOGS.GPJ GINT STD AGS.3_1.GDT 31/1/22

Shoring/Support: Stability: 	N	GENERAL REMARKS Shallow hand dug pit for environmental sampling.

All dimensions in metres Scale 1:25	Client Hayfield Homes Ltd	Method/ Plant Used Hand tools.	Logged By JT
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TRIAL PIT LOG

Project Berry Hill Road, Adderbury.				TRIAL PIT No HP2
Job No BC592	Date 20-12-21	Ground Level (m)	Co-Ordinates ()	
Contractor The Brownfield Consultancy Ltd				Sheet 1 of 1

STRATA		SAMPLES & TESTS			
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.10		Black sandy GRAVEL of angular to subrounded fine to coarse tarmac, red brick and some unknown lithologies. One cobble of paving slab. (MADE GROUND)	0.05	ES	
0.10-1.00		Firm brown slightly sandy slightly gravelly CLAY. Gravel is angular and subangular fine to coarse limestone. Becoming increasingly gravelly with depth. (MARLSTONE ROCK BED)			
1.00		Pit terminated at target depth.			


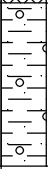
BROWNFIELD TP ADDERBURY LOGS.GPJ GINT STD AGS.3_1.GDT 31/1/22

Shoring/Support: Stability: 	GENERAL REMARKS
	Shallow hand dug pit for environmental sampling.

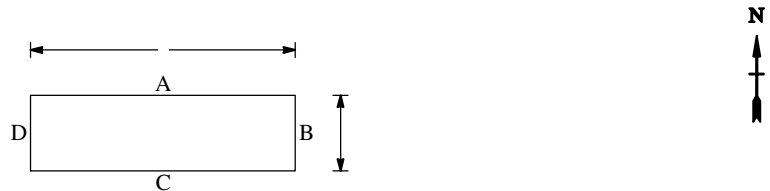
All dimensions in metres Scale 1:25	Client Hayfield Homes Ltd	Method/ Plant Used Hand tools.	Logged By JT
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TRIAL PIT LOG

Project Berry Hill Road, Adderbury.				TRIAL PIT No HP3
Job No BC592	Date 20-12-21	Ground Level (m)	Co-Ordinates ()	
Contractor The Brownfield Consultancy Ltd				Sheet 1 of 1

STRATA		SAMPLES & TESTS			
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.16		Black sandy GRAVEL of angular to subrounded fine to coarse tarmac, red brick and some unknown lithologies. (MADE GROUND)	0.05	ES	
0.16-0.70		Firm brown slightly sandy slightly gravelly CLAY. Gravel is angular and subangular fine and medium limestone. (MARLSTONE ROCK BED)			
0.70		Pit terminated at target depth.			

BROWNFIELD TP ADDERBURY LOGS.GPJ GINT STD AGS.3_1.GDT 31/1/22

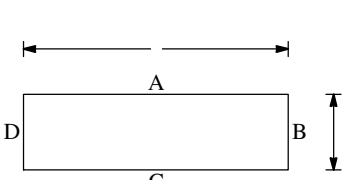
Shoring/Support: Stability: 	GENERAL REMARKS
	Shallow hand dug pit for environmental sampling.

All dimensions in metres Scale 1:25	Client Hayfield Homes Ltd	Method/ Plant Used Hand tools.	Logged By JT
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Project Berry Hill Road, Adderbury.				TRIAL PIT No HP4
Job No BC592	Date 20-12-21	Ground Level (m)	Co-Ordinates ()	
Contractor The Brownfield Consultancy Ltd				Sheet 1 of 1

STRATA		SAMPLES & TESTS			
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.10		Light grey fine to coarse SAND. Geotextile at base of deposit. (MADE GROUND)	0.05	ES	
0.10-0.26		Medium and coarse subangular GRAVEL of white limestone. (MADE GROUND)	0.15	ES	
0.26-0.60		Firm brown slightly sandy slightly gravelly CLAY. Gravel is angular and subangular fine to coarse limestone. (MARLSTONE ROCK BED)			
0.60		Pit terminated at target depth.			

BROWNFIELD TP ADDERBURY LOGS.GPJ GINT STD AGS.3_1.GDT 31/1/22

Shoring/Support: Stability: 	GENERAL REMARKS
	Shallow hand dug pit for environmental sampling.

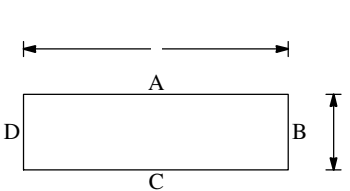
All dimensions in metres Scale 1:25	Client Hayfield Homes Ltd	Method/ Plant Used Hand tools.	Logged By JT
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TRIAL PIT LOG

Project Berry Hill Road, Adderbury.				TRIAL PIT No HP5
Job No BC592	Date 20-12-21	Ground Level (m)	Co-Ordinates ()	
Contractor The Brownfield Consultancy Ltd				Sheet 1 of 1

STRATA		SAMPLES & TESTS			
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.80		Brown gravelly very sandy CLAY. Gravel is angular and subangular fine to coarse limestone. Locally gravel predominant. (MADE GROUND)			
0.80		Difficult digging. Pit terminated at target depth.	0.70	ES	

BROWNFIELD TP ADDERBURY LOGS.GPJ GINT STD AGS.3_1.GDT 31/1/22

Shoring/Support: Stability: 	N	GENERAL REMARKS Shallow hand dug pit for environmental sampling.

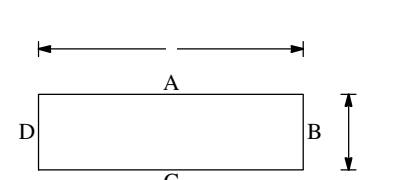
All dimensions in metres Scale 1:25	Client Hayfield Homes Ltd	Method/ Plant Used Hand tools.	Logged By JT
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TRIAL PIT LOG

Project Berry Hill Road, Adderbury.				TRIAL PIT No HP6
Job No BC592	Date 20-12-21	Ground Level (m)	Co-Ordinates ()	
Contractor The Brownfield Consultancy Ltd				Sheet 1 of 1


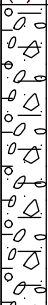
STRATA		SAMPLES & TESTS			
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.14		Black and dark grey sandy GRAVEL of angular to subrounded fine to coarse tarmac and some unknown lithologies. One tabular boulder of tarmac. (MADE GROUND)	0.05	ES	
0.14-0.22		Brown and red brown sandy GRAVEL of medium to coarse red brick and limestone. (MADE GROUND)	0.15	ES	
0.22-0.65		Firm brown slightly sandy slightly gravelly CLAY. Gravel is angular and subangular fine to coarse limestone. (MARLSTONE ROCK BED)			
0.65		Pit terminated at target depth.			

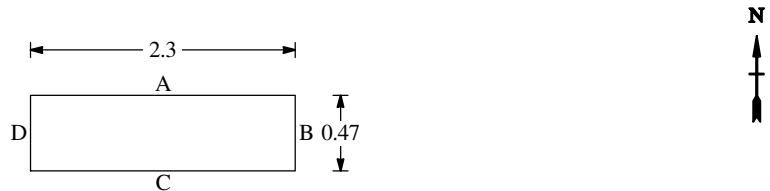
BROWNFIELD TP ADDERBURY LOGS.GPJ GINT STD AGS.3_1.GDT 31/1/22

Shoring/Support: Stability: 	GENERAL REMARKS
	Shallow hand dug pit for environmental sampling.

All dimensions in metres Scale 1:25	Client Hayfield Homes Ltd	Method/ Plant Used Hand tools.	Logged By JT
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Project Berry Hill Road, Adderbury.				TRIAL PIT No SA1
Job No BC592	Date 21-12-21	Ground Level (m)	Co-Ordinates () E 46,978.0 N 34,828.0	
Contractor The Brownfield Consultancy Ltd				Sheet 1 of 1

STRATA		SAMPLES & TESTS			
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.50		Brown slightly gravelly very clayey SAND. Gravel is angular and subangular fine and medium occasionally coarse limestone. (TOPSOIL)			
0.50-1.50		Brown sandy very clayey GRAVEL with a high cobble content. Gravel is angular and subangular fine to coarse limestone. Cobbles are subangular limestone. (MARLSTONE ROCK BED)			
1.50		Trial pit terminated at target depth.			

Shoring/Support: Stability: Sides stable. 	GENERAL REMARKS

All dimensions in metres Scale 1:25	Client Hayfield Homes Ltd	Method/ Plant Used JCB 3CX and water tanker	Logged By JT
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BROWNFIELD TP ADDERBURY LOGS.GPJ GINT STD AGS.3_1.GDT 31/1/22

Project Berry Hill Road, Adderbury.				TRIAL PIT No SA2
Job No BC592	Date 21-12-21	Ground Level (m)	Co-Ordinates () E 46,932.0 N 34,828.0	
Contractor The Brownfield Consultancy Ltd				Sheet 1 of 1

STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.50		Brown slightly gravelly very clayey SAND. Gravel is angular and subangular fine and medium occasionally coarse limestone. (TOPSOIL)			
0.50-0.90		Brown sandy very clayey GRAVEL with a high cobble content. Gravel is angular and subangular fine to coarse limestone. Cobbles are subangular limestone. (MARLSTONE ROCK BED)			
0.90-1.30		Firm light brown SILT / CLAY. (MARLSTONE ROCK BED)			
1.30-1.50		Brown sandy very clayey GRAVEL with a high cobble content. Gravel is angular and subangular fine to coarse limestone. Cobbles are subangular limestone. (MARLSTONE ROCK BED)			
1.50		Trial pit terminated at target depth.			

BROWNFIELD TP ADDERBURY LOGS.GPJ GINT STD AGS.3_1.GDT 31/1/22

Shoring/Support: Stability: Sides stable.	GENERAL REMARKS

All dimensions in metres Scale 1:25	Client Hayfield Homes Ltd	Method/ Plant Used JCB 3CX and water tanker	Logged By JT
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DYNAMIC PROBE LOG

Project Berry Hill Road, Adderbury.				PROBE No DP1
Job No BC592	Date 21-12-21	Ground Level (m)	Co-Ordinates () E 46,991.0 N 34,767.0	
Contractor The Brownfield Consultancy Ltd				Sheet 1 of 1

Depth (m)	Readings (blows/100mm)	Diagram (N100 Values)						Torque (Nm)	Remarks
		5	10	15	20	25	30		
1	0								
	0								
	1								
	2								
	2								
	3								
2	4								
	3								
	3								
	2								
	8								
	9								
3	5								
	8								
	9								
	14								
	6								
	6								
4	10								
	9								
	8								
	6								
	5								
	4								
5	2								
	2								
	1								
	2								
	10								
	10								
6	9								
	9								
	10								
	10								
	9								
	11								

BROWNFIELD DP LOG - ADDERBURY LOGS.GPJ GINT STD.AGS.3.1.GDT 31/1/22

Hammer Wt (kg)	63.5		GENERAL REMARKS
Hammer Drop (mm)	760		
Cone Dia (mm)	50.5		
Cone Type	Fixed		
Damper			

All dimensions in metres Scale 1:43.75	Client Hayfield Homes Ltd	Method/ Plant Used Dynamic Sampling Rig	Logged By JT
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Project Berry Hill Road, Adderbury.				PROBE No DP2
Job No BC592	Date 21-12-21	Ground Level (m)	Co-Ordinates () E 46,970.0 N 347,960.0	
Contractor The Brownfield Consultancy Ltd				Sheet 1 of 1

Depth (m)	Readings (blows/100mm)	Diagram (N100 Values)						Torque (Nm)	Remarks
		5	10	15	20	25	30		
0	0								
0.2	1								
0.4	2								
0.6	2								
0.8	2								
1.0	2								
1.2	3								
1.4	5								
1.6	4								
1.8	8								
2.0	11								
2.2	12								
2.4	12								
2.6	20								
2.8	21								
3.0	33						33		
3.2									
3.4									
3.6									
3.8									
4.0									
4.2									
4.4									
4.6									
4.8									
5.0									
5.2									
5.4									
5.6									
5.8									
6.0									

Hammer Wt (kg)	63.5		GENERAL REMARKS
Hammer Drop (mm)	760		
Cone Dia (mm)	50.5		
Cone Type	Fixed		
Damper			

All dimensions in metres Scale 1:43.75	Client Hayfield Homes Ltd	Method/ Plant Used Dynamic Sampling Rig	Logged By JT
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BROWNFIELD DP LOG - ADDERBURY LOGS.GPJ GINT STD.AGS.3.1.GDT 31/1/22

DYNAMIC PROBE LOG

Project Berry Hill Road, Adderbury.				PROBE No DP3
Job No BC592	Date 21-12-21	Ground Level (m)	Co-Ordinates () E 46,949.0 N 34,747.0	
Contractor The Brownfield Consultancy Ltd				Sheet 1 of 1

Depth (m)	Readings (blows/100mm)	Diagram (N100 Values)						Torque (Nm)	Remarks
		5	10	15	20	25	30		
0	0								
1	1								
2	2								
3	3								
4	4								
5	5								
6	6								
7	7								
8	8								
9	9								
10	10								
11	11								
12	12								
13	13								
14	14								
15	15								
16	16								
17	17								
18	18								
19	19								
20	20								
21	21								
22	22								
23	23								
24	24								
25	25								
26	26								
27	27								
28	28								
29	29								
30	30								
31	31								
32	32								
33	33								
34	34								
35	35								
36	36								
37	37								
38	38								
39	39								
40	40								
41	41								
42	42								
43	43								
44	44								
45	45								
46	46								
47	47								
48	48								
49	49								
50	50								

BROWNFIELD DP LOG - ADDERBURY LOGS.GPJ GINT STD.AGS.3.1.GDT 31/1/22

Hammer Wt (kg)	63.5		GENERAL REMARKS
Hammer Drop (mm)	760		
Cone Dia (mm)	50.5		
Cone Type	Fixed		
Damper			

All dimensions in metres Scale 1:43.75	Client Hayfield Homes Ltd	Method/ Plant Used Dynamic Sampling Rig	Logged By JT
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Project Berry Hill Road, Adderbury.				PROBE No DP4
Job No BC592	Date 21-12-21	Ground Level (m)	Co-Ordinates () E 46,906.0 N 34,782.0	
Contractor The Brownfield Consultancy Ltd				Sheet 1 of 1

Depth (m)	Readings (blows/100mm)	Diagram (N100 Values)						Torque (Nm)	Remarks
		5	10	15	20	25	30		
1	0								
	1	3							
	2	3							
	3	4							
	4	2							
	4	2							
2	4	5							
	8	4							
	4	1							
3	2	2							
	6	3							
	3	3							
	4	4							
	4	4							
	3	3							
4	1	1							
	3	2							
	2	2							
	5	6							
	10	6							
	12	12							
5	11	11							
	12	12							
	13	14							
	14	14							
	12	12							
	12	12							
6	10	10							
	12	12							
	8	7							
	6	6							
	7	7							
	7	7							

BROWNFIELD DP LOG - ADDERBURY LOGS.GPJ GINT STD.AGS.3.1.GDT 31/1/22

Hammer Wt (kg)	63.5		GENERAL REMARKS
Hammer Drop (mm)	760		
Cone Dia (mm)	50.5		
Cone Type	Fixed		
Damper			

All dimensions in metres Scale 1:43.75	Client Hayfield Homes Ltd	Method/ Plant Used Dynamic Sampling Rig	Logged By JT
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DYNAMIC PROBE LOG

Project Berry Hill Road, Adderbury.				PROBE No DP5
Job No BC592	Date 21-12-21	Ground Level (m)	Co-Ordinates () E 46,902.0 N 34,813.0	
Contractor The Brownfield Consultancy Ltd				Sheet 1 of 1

Depth (m)	Readings (blows/100mm)	Diagram (N100 Values)						Torque (Nm)	Remarks
		5	10	15	20	25	30		
1	0								
	2	2							
	3	3							
	4	4							
	7	9							
	3	3							
	4	4							
	3	3							
	2	2							
	2	2							
2	12	25							
	6	6							
	7	7							
	5	5							
	4	4							
	3	3							
	2	2							
	1	1							
	12	9							
	11	11							
3	11	11							
	12	12							
	15	12							
	14	14							
	12	12							
	9	9							
	7	7							
	8	8							
	8	8							
	7	7							
4	6	4							
	4	4							
	3	3							
	2	2							
	5	5							
	4	4							
	3	3							
	2	2							
	5	5							
	6	6							

BROWNFIELD DP LOG - ADDERBURY LOGS.GPJ GINT STD.AGS.3.1.GDT 31/1/22

Hammer Wt (kg)	63.5		GENERAL REMARKS
Hammer Drop (mm)	760		
Cone Dia (mm)	50.5		
Cone Type	Fixed		
Damper			

All dimensions in metres Scale 1:43.75	Client Hayfield Homes Ltd	Method/ Plant Used Dynamic Sampling Rig	Logged By JT
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DYNAMIC PROBE LOG

Project Berry Hill Road, Adderbury.				PROBE No DP6
Job No BC592	Date 21-12-21	Ground Level (m)	Co-Ordinates () E 46,872.0 N 34,849.0	
Contractor The Brownfield Consultancy Ltd				Sheet 1 of 1

Depth (m)	Readings (blows/100mm)	Diagram (N100 Values)						Torque (Nm)	Remarks
		5	10	15	20	25	30		
1	0								
	1	1							
	2	2							
	3	2							
	4	9							
	5	4							
	6	3							
	7	4							
	8	2							
	9	4							
2	0								
	1	1							
	2	2							
	3	4							
	4	5							
	5	6							
	6	5							
	7	6							
	8	5							
	9	6							
3	0								
	1	21							
	2	1							
	3	0							
	4	2							
	5	3							
	6	3							
	7	8							
	8	9							
	9	10							
4	0								
	1	0							
	2	3							
	3	6							
	4	7							
	5	8							
	6	9							
	7	10							
	8	8							
	9	7							
5	0								
	1	6							
	2	6							
	3	7							
	4	6							
	5	0							
	6	0							
	7	0							
	8	0							
	9	0							
6	0								
	1	3							
	2	3							
	3	9							
	4	12							
	5								
	6								
	7								
	8								
	9								

BROWNFIELD DP LOG - ADDERBURY LOGS.GPJ GINT STD.AGS.3.1.GDT 31/1/22

Hammer Wt (kg)	63.5		GENERAL REMARKS
Hammer Drop (mm)	760		
Cone Dia (mm)	50.5		
Cone Type	Fixed		
Damper			

All dimensions in metres Scale 1:43.75	Client Hayfield Homes Ltd	Method/ Plant Used Dynamic Sampling Rig	Logged By JT
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Project Berry Hill Road, Adderbury.				PROBE No DP7
Job No BC592	Date 21-12-21	Ground Level (m)	Co-Ordinates () E 46,886.0 N 34,867.0	
Contractor The Brownfield Consultancy Ltd				Sheet 1 of 1

Depth (m)	Readings (blows/100mm)	Diagram (N100 Values)						Torque (Nm)	Remarks
		5	10	15	20	25	30		
0	1								
1	1								
2	2								
3	3								
4	1								
5	2								
6	5								
7	6								
8	5								
9	2								
10	3								
11	3								
12	4								
13	7								
14	4								
15	6								
16	5								
17	5								
18	5								
19	3								
20	3								
21	3								
22	3								
23	8								
24	5								
25	6								
26	50								

BROWNFIELD DP LOG - ADDERBURY LOGS.GPJ GINT STD.AGS.3.1.GDT 31/1/22

Hammer Wt (kg)	63.5		GENERAL REMARKS
Hammer Drop (mm)	760		
Cone Dia (mm)	50.5		
Cone Type	Fixed		
Damper			

All dimensions in metres Scale 1:43.75	Client Hayfield Homes Ltd	Method/ Plant Used Dynamic Sampling Rig	Logged By JT
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DYNAMIC PROBE LOG

Project Berry Hill Road, Adderbury.				PROBE No DP8
Job No BC592	Date 21-12-21	Ground Level (m)	Co-Ordinates () E 46,917.0 N 34,850.0	
Contractor The Brownfield Consultancy Ltd				Sheet 1 of 1

Depth (m)	Readings (blows/100mm)	Diagram (N100 Values)						Torque (Nm)	Remarks
		5	10	15	20	25	30		
0	0								
1	1								
2	2								
3	3								
4	4								
5	5								
6	6								

BROWNFIELD DP LOG - ADDERBURY LOGS.GPJ GINT STD.AGS.3.1.GDT 31/1/22

Hammer Wt (kg)	63.5		GENERAL REMARKS
Hammer Drop (mm)	760		
Cone Dia (mm)	50.5		
Cone Type	Fixed		
Damper			

All dimensions in metres Scale 1:43.75	Client Hayfield Homes Ltd	Method/ Plant Used Dynamic Sampling Rig	Logged By JT
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DYNAMIC PROBE LOG

Project Berry Hill Road, Adderbury.				PROBE No DP9
Job No BC592	Date 21-12-21	Ground Level (m)	Co-Ordinates () E 46,961.0 N 34,841.0	
Contractor The Brownfield Consultancy Ltd				Sheet 1 of 1

Depth (m)	Readings (blows/100mm)	Diagram (N100 Values)						Torque (Nm)	Remarks
		5	10	15	20	25	30		
1	0								
	0	2							
	1	1							
	2	2							
	2	2							
	2	2							
	2	3							
	2	1							
	2	1							
	2	3							
2	5	4							
	4	4							
	3	3							
	3	3							
	3	2							
	4	1							
	4	1							
	4	4							
	4	5							
	4	4							
3	3	4							
	3	3							
	2	2							
	2	1							
	4	2							
	4	4							
	4	6							
	5	5							
	5	5							
	5	3							
4	2	3							
	2	2							
	2	2							
	3	3							
	3	3							
	4	4							
	4	4							
	4	4							
	4	4							
	4	5							
5	3	4							
	3	3							
	3	3							
	4	4							
	4	4							
	4	4							
	4	4							
	4	4							
	4	4							
	4	5							
6	4	5							
	4	4							
	4	4							
	4	4							
	4	4							
	4	4							
	4	4							
	4	4							
	4	4							
	4	5							

BROWNFIELD DP LOG - ADDERBURY LOGS.GPJ GINT STD.AGS.3.1.GDT 31/1/22

Hammer Wt (kg)	63.5		GENERAL REMARKS
Hammer Drop (mm)	760		
Cone Dia (mm)	50.5		
Cone Type	Fixed		
Damper			

All dimensions in metres Scale 1:43.75	Client Hayfield Homes Ltd	Method/ Plant Used Dynamic Sampling Rig	Logged By JT
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DYNAMIC PROBE LOG

Project Berry Hill Road, Adderbury.				PROBE No DP10
Job No BC592	Date 21-12-21	Ground Level (m)	Co-Ordinates () E 46,978.0 N 34,885.0	
Contractor The Brownfield Consultancy Ltd				Sheet 1 of 1

Depth (m)	Readings (blows/100mm)	Diagram (N100 Values)						Torque (Nm)	Remarks
		5	10	15	20	25	30		
0	0								
1	2								
2	2								
3	4								
4	7								
5	3								
6	2								
7	2								
8	1								
9	2								
10	4								
11	3								
12	5								
13	5								
14	4								
15	3								
16	2								
17	1								
18	4								
19	3								
20	3								
21	4								
22	10								
23	11								
24	8								
25	8								
26	54							54	

BROWNFIELD DP LOG - ADDERBURY LOGS.GPJ GINT STD.AGS.3.1.GDT 31/1/22

Hammer Wt (kg)	63.5		GENERAL REMARKS
Hammer Drop (mm)	760		
Cone Dia (mm)	50.5		
Cone Type	Fixed		
Damper			

All dimensions in metres Scale 1:43.75	Client Hayfield Homes Ltd	Method/ Plant Used Dynamic Sampling Rig	Logged By JT
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APPENDIX C

Geotechnical Laboratory Results



TEST CERTIFICATE

DETERMINATION OF LIQUID AND PLASTIC LIMITS
Tested in Accordance with: BS 1377-2:1990: Clause 4.4 and 5

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



Environmental Science

4041

Client: The Brownfield Consultancy
Client Address: Woodstock, Memorial Road,
Fenny Compton, Warwickshire,
CV47 2XU
Contact: Jim Twaddle
Site Address: Berry Hill Road Adderbury

Client Reference: BCS92
Job Number: 21-30761
Date Sampled: 20/12/2021
Date Received: 22/12/2021
Date Tested: 12/01/2022
Sampled By: Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

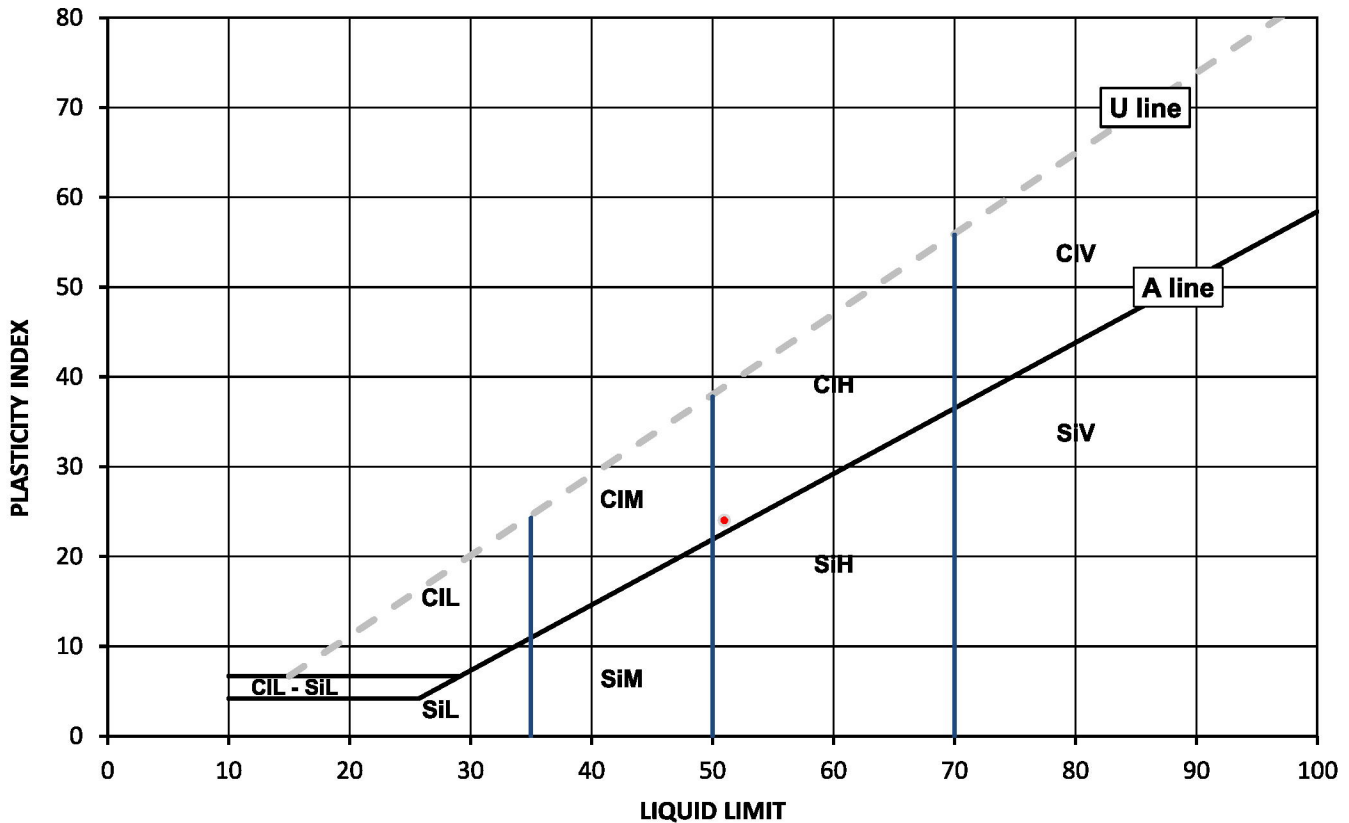
Test Results:

Laboratory Reference: 2126101
Hole No.: WS4
Sample Reference: Not Given
Sample Description: Yellowish brown slightly sandy CLAY

Depth Top [m]: 2.00
Depth Base [m]: Not Given
Sample Type: D

Sample Preparation: Tested in natural condition

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
24	51	27	24	100



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

Cl	Clay	Plasticity	Liquid Limit
Si	Silt	L	Low
		M	Medium
		H	High
		V	Very high
		O	Organic
			append to classification for organic material (eg CIHO)

Note: Water Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Signed:



Anna Dudzinska
Deputy Head of Geo Office Section
for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

DETERMINATION OF LIQUID AND PLASTIC LIMITS
Tested in Accordance with: BS 1377-2:1990: Clause 4.4 and 5

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



Environmental Science

4041

Client: The Brownfield Consultancy
Client Address: Woodstock, Memorial Road,
Fenny Compton, Warwickshire,
CV47 2XU
Contact: Jim Twaddle
Site Address: Berry Hill Road Adderbury

Client Reference: BCS92
Job Number: 21-30761
Date Sampled: 20/12/2021
Date Received: 22/12/2021
Date Tested: 12/01/2022
Sampled By: Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

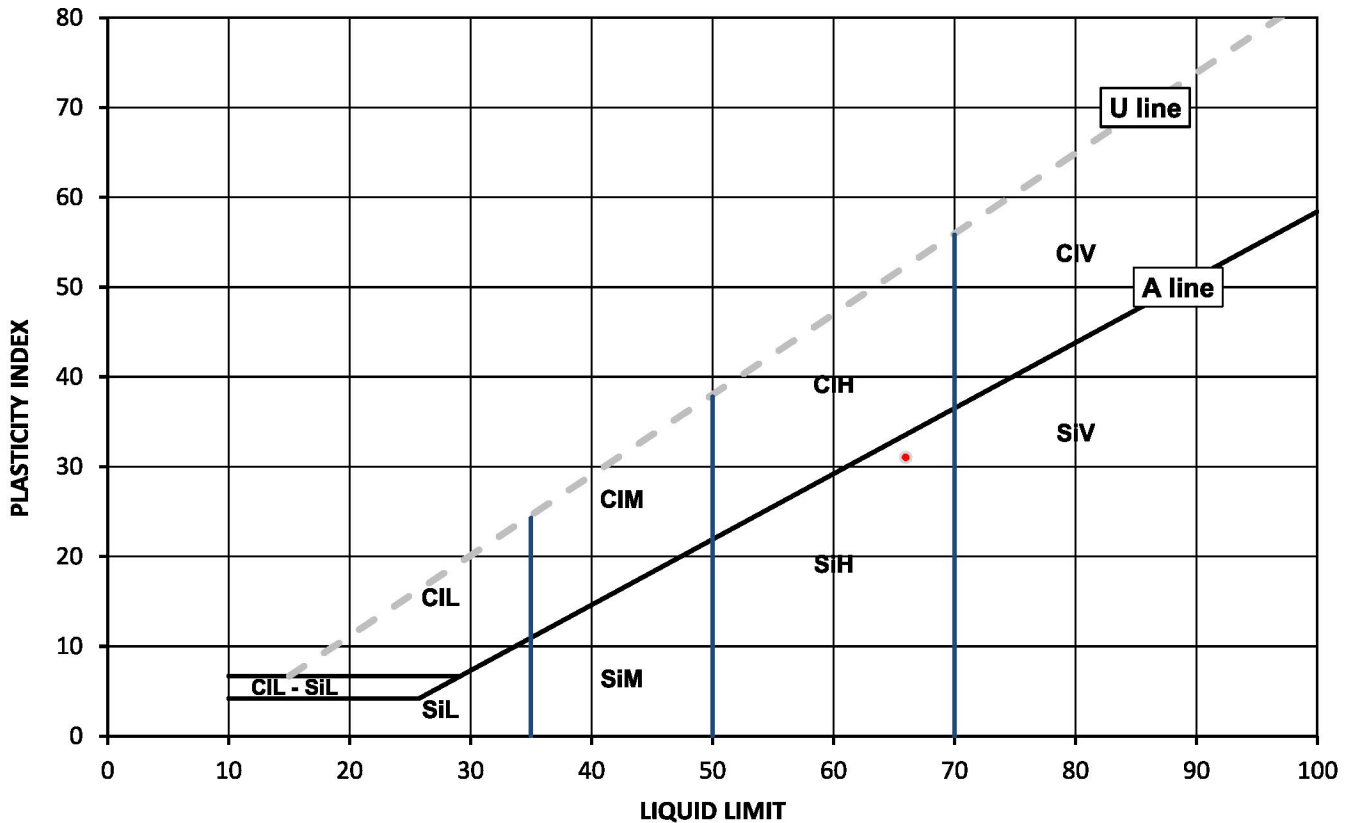
Test Results:

Laboratory Reference: 2126102
Hole No.: WS5
Sample Reference: Not Given
Sample Description: Yellowish brown slightly gravelly CLAY

Depth Top [m]: 0.80
Depth Base [m]: Not Given
Sample Type: D

Sample Preparation: Tested after >425um removed by hand

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
39	66	35	31	82



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

Cl	Clay	Plasticity	L	Low	Liquid Limit	below 35
Si	Silt		M	Medium		35 to 50
			H	High		50 to 70
			V	Very high		exceeding 70
			O	Organic		append to classification for organic material (eg CIHO)

Note: Water Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Signed:

Anna Dudzinska
Deputy Head of Geo Office Section
for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

DETERMINATION OF LIQUID AND PLASTIC LIMITS
Tested in Accordance with: BS 1377-2:1990: Clause 4.4 and 5

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



Environmental Science

4041

Client: The Brownfield Consultancy
Client Address: Woodstock, Memorial Road,
Fenny Compton, Warwickshire,
CV47 2XU
Contact: Jim Twaddle
Site Address: Berry Hill Road Adderbury

Client Reference: BCS92
Job Number: 21-30761
Date Sampled: 20/12/2021
Date Received: 22/12/2021
Date Tested: 12/01/2022
Sampled By: Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

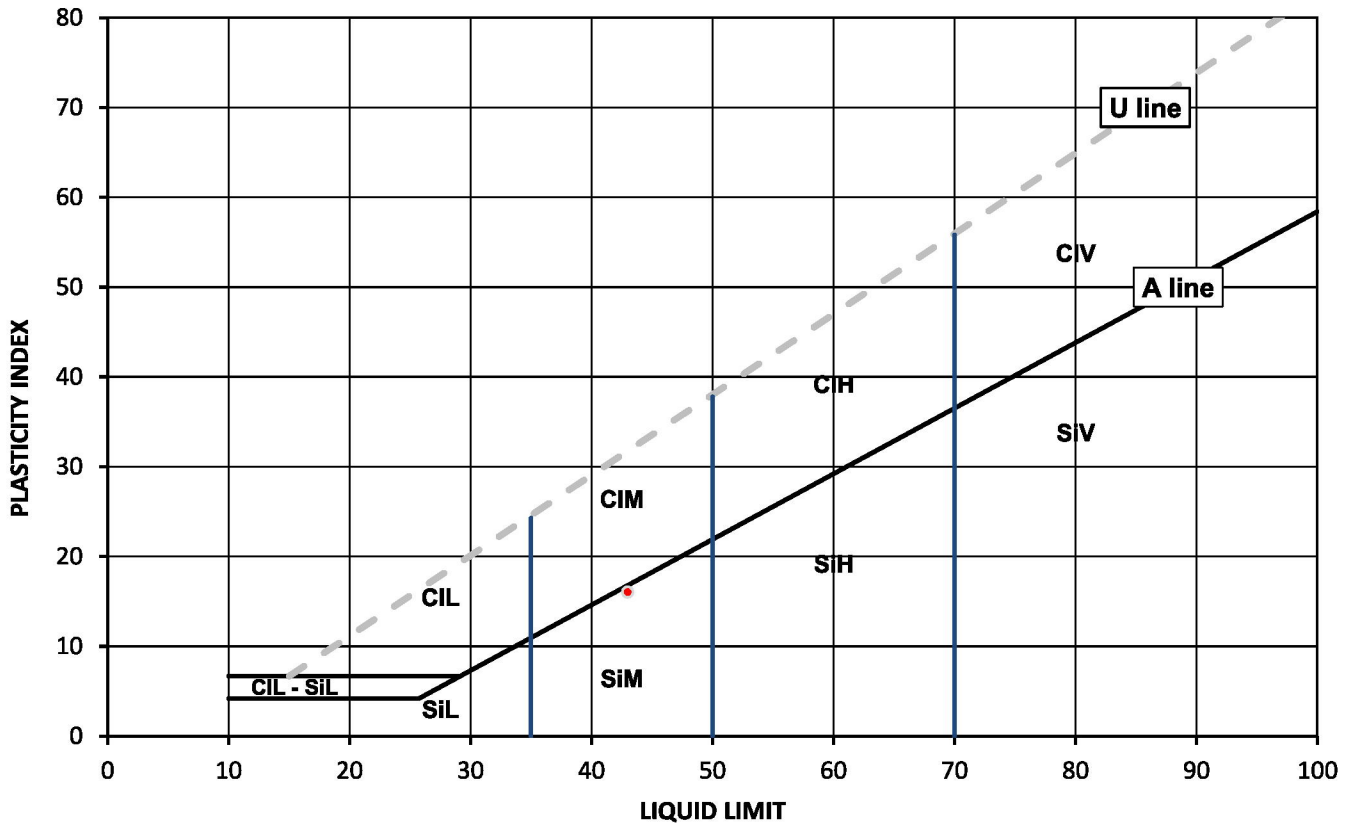
Test Results:

Laboratory Reference: 2126103
Hole No.: WS5
Sample Reference: Not Given
Sample Description: Yellowish brown sandy silty CLAY

Depth Top [m]: 2.40
Depth Base [m]: Not Given
Sample Type: D

Sample Preparation: Tested in natural condition

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
22	43	27	16	100



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

CI	Clay	Plasticity	Liquid Limit
Si	Silt	L	Low
		M	Medium
		H	High
		V	Very high
		O	Organic
			below 35
			35 to 50
			50 to 70
			exceeding 70
			append to classification for organic material (eg CIHO)

Note: Water Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Signed:



Anna Dudzinska
Deputy Head of Geo Office Section
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TEST CERTIFICATE

DETERMINATION OF LIQUID AND PLASTIC LIMITS
Tested in Accordance with: BS 1377-2:1990: Clause 4.4 and 5

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



Environmental Science

4041

Client: The Brownfield Consultancy
Client Address: Woodstock, Memorial Road,
Fenny Compton, Warwickshire,
CV47 2XU
Contact: Jim Twaddle
Site Address: Berry Hill Road Adderbury

Client Reference: BCS92
Job Number: 21-30761
Date Sampled: 20/12/2021
Date Received: 22/12/2021
Date Tested: 12/01/2022
Sampled By: Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

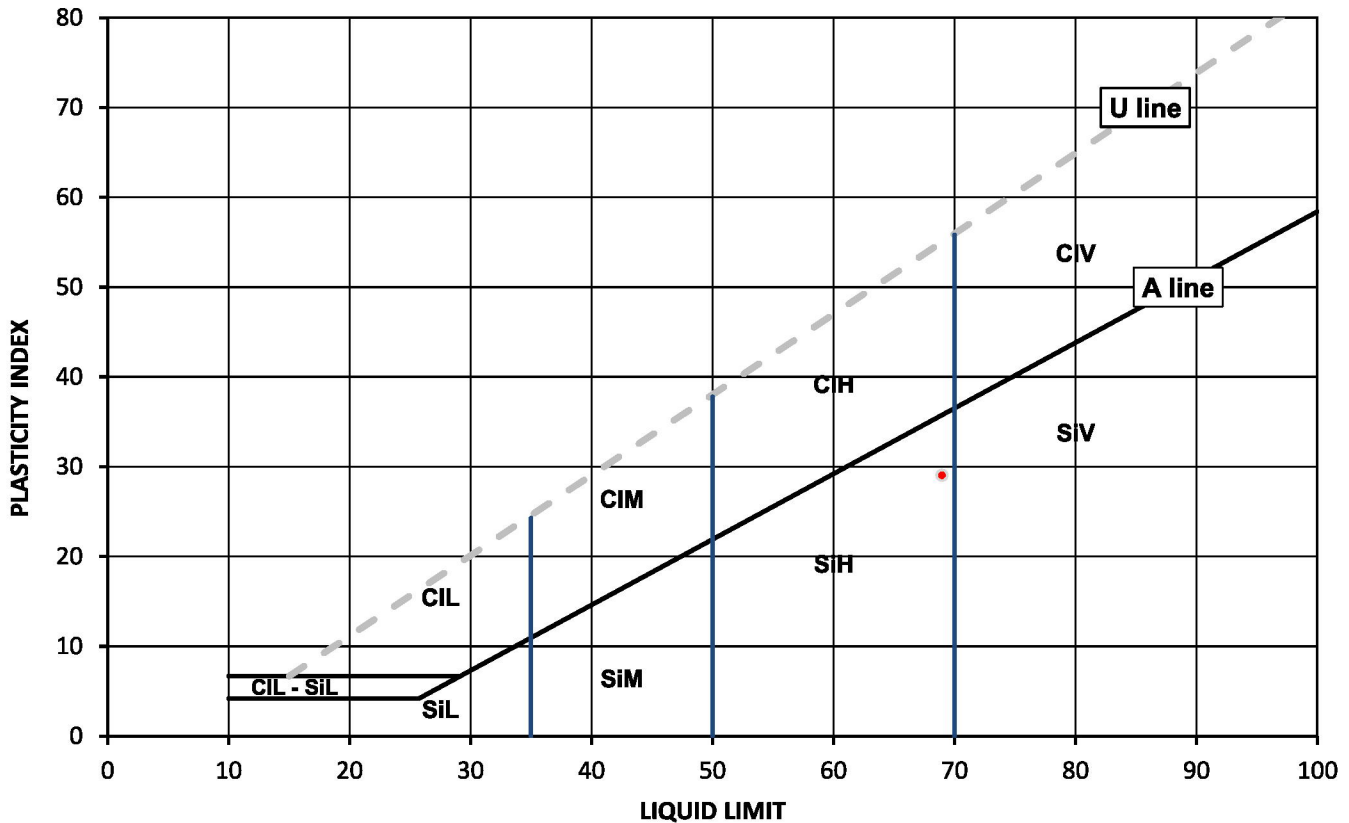
Test Results:

Laboratory Reference: 2127799
Hole No.: WS1
Sample Reference: Not Given
Sample Description: Orangish brown slightly gravelly silty CLAY

Depth Top [m]: 2.00
Depth Base [m]: Not Given
Sample Type: D

Sample Preparation: Tested after washing to remove >425um

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
38	69	40	29	79



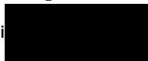
Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

Cl	Clay	Plasticity	L	Low	Liquid Limit	below 35
Si	Silt		M	Medium		35 to 50
			H	High		50 to 70
			V	Very high		exceeding 70
			O	Organic		append to classification for organic material (eg CIHO)

Note: Water Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Signed:



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TEST CERTIFICATE

DETERMINATION OF LIQUID AND PLASTIC LIMITS
Tested in Accordance with: BS 1377-2:1990: Clause 4.4 and 5

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



Environmental Science

4041

Client: The Brownfield Consultancy
Client Address: Woodstock, Memorial Road,
Fenny Compton, Warwickshire,
CV47 2XU
Contact: Jim Twaddle
Site Address: Berry Hill Road Adderbury

Client Reference: BCS92
Job Number: 21-30761
Date Sampled: 20/12/2021
Date Received: 22/12/2021
Date Tested: 12/01/2022
Sampled By: Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

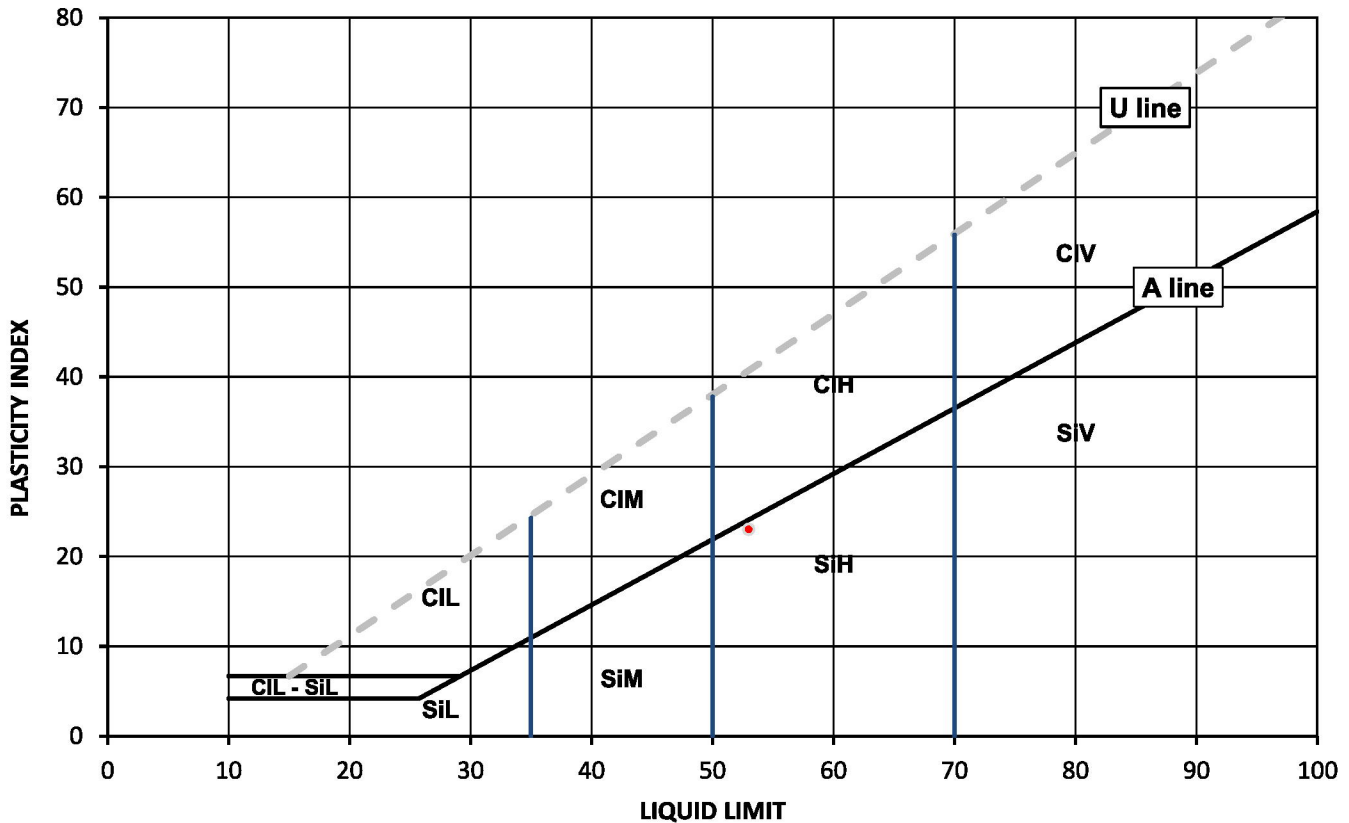
Test Results:

Laboratory Reference: 2127800
Hole No.: WS2
Sample Reference: Not Given
Sample Description: Orangish brown slightly sandy gravelly silty CLAY

Depth Top [m]: 0.70
Depth Base [m]: Not Given
Sample Type: D

Sample Preparation: Tested after washing to remove >425um

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
37	53	30	23	52



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

Cl	Clay	Plasticity	L	Low	Liquid Limit	below 35
Si	Silt		M	Medium		35 to 50
			H	High		50 to 70
			V	Very high		exceeding 70
			O	Organic		append to classification for organic material (eg CIHO)

Note: Water Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Signed:

Anna Dudzinska
Deputy Head of Geo Office Section
for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

DETERMINATION OF LIQUID AND PLASTIC LIMITS
Tested in Accordance with: BS 1377-2:1990: Clause 4.4 and 5

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



Environmental Science

4041

Client: The Brownfield Consultancy
Client Address: Woodstock, Memorial Road,
Fenny Compton, Warwickshire,
CV47 2XU
Contact: Jim Twaddle
Site Address: Berry Hill Road Adderbury

Client Reference: BCS92
Job Number: 21-30761
Date Sampled: 20/12/2021
Date Received: 22/12/2021
Date Tested: 12/01/2022
Sampled By: Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

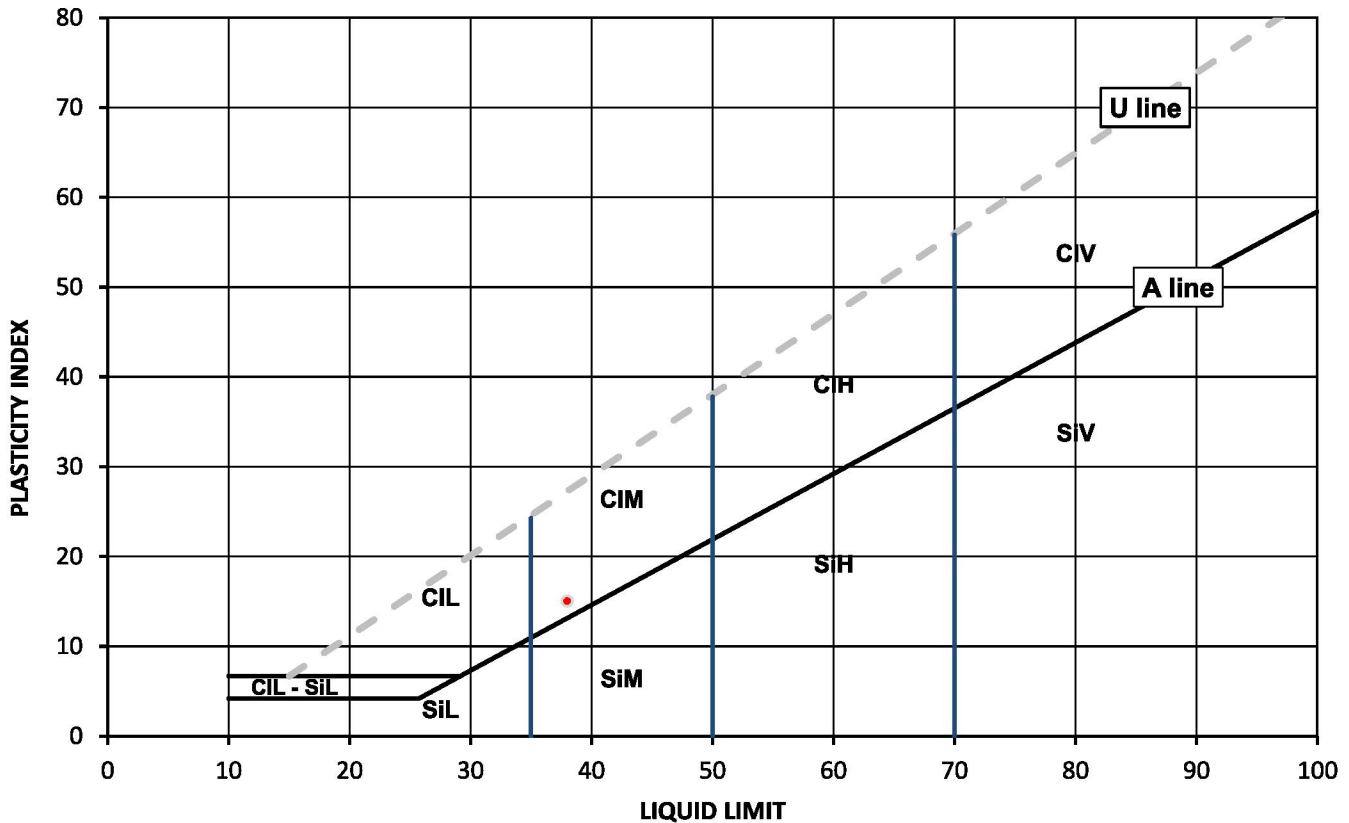
Test Results:

Laboratory Reference: 2127801
Hole No.: WS3
Sample Reference: Not Given
Sample Description: Brown slightly gravelly sandy CLAY

Depth Top [m]: 0.80
Depth Base [m]: Not Given
Sample Type: D

Sample Preparation: Tested after washing to remove >425um

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
24	38	23	15	72



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

	Plasticity	Liquid Limit
Cl Clay	L Low	below 35
Si Silt	M Medium	35 to 50
	H High	50 to 70
	V Very high	exceeding 70
	O Organic	append to classification for organic material (eg CIHO)

Note: Water Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Signed:

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Deputy Head of Geo Office Section
for and on behalf of i2 Analytical Ltd

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SUMMARY REPORT

SUMMARY OF CLASSIFICATION TEST RESULTS

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



Environmental Science

Tested in Accordance with:

4041
Client: The Brownfield Consultancy
Client Address: Woodstock, Memorial Road,
Fenny Compton, Warwickshire,
CV47 2XU
Contact: Jim Twaddle
Site Address: Berry Hill Road Adderbury

Water Content by BS 1377-2:1990: Clause 3.2; Atterberg by BS 1377-2: 1990:
Clause 4.3 (4 Point Test), Clause 4.4 (1 Point Test) and 5; PD by BS 1377-2:
1990: Clause 8.2

Client Reference: BCS92
Job Number: 21-30761
Date Sampled: 20/12 - 20/12/2021
Date Received: 22/12/2021
Date Tested: 12/01/2022
Sampled By: Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test results

Laboratory Reference	Hole No.	Sample				Description	Remarks	Water Content BS 1377-2 [W] %	Water Content BS EN ISO 17892-1 [W] %	Atterberg				Density			Total Porosity# %		
		Reference	Depth Top m	Depth Base m	Type					% Passing 425um	WL %	Wp %	Ip %	bulk Mg/m3	dry Mg/m3	PD Mg/m3			
2127799	WS1	Not Given	2.00	Not Given	D	Orangish brown slightly gravelly silty CLAY	Atterberg 1 Point	38		79	69	40	29						
2127800	WS2	Not Given	0.70	Not Given	D	Orangish brown slightly sandy gravelly silty CLAY	Atterberg 1 Point	37		52	53	30	23						
2127801	WS3	Not Given	0.80	Not Given	D	Brown slightly gravelly sandy CLAY	Atterberg 1 Point	24		72	38	23	15						
2126101	WS4	Not Given	2.00	Not Given	D	Yellowish brown slightly sandy CLAY	Atterberg 1 Point	24		100	51	27	24						
2126102	WS5	Not Given	0.80	Not Given	D	Yellowish brown slightly gravelly CLAY	Atterberg 1 Point	39		82	66	35	31						
2126103	WS5	Not Given	2.40	Not Given	D	Yellowish brown sandy silty CLAY	Atterberg 1 Point	22		100	43	27	16						

Note: # Non accredited; NP - Non plastic

Comments:

Signed:



Anna Dudzinska
Deputy Head of Geo Office Section
for and on behalf of i2 Analytical Ltd

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SUMMARY REPORT

DETERMINATION OF WATER CONTENT

Tested in Accordance with: BS 1377-2: 1990: Clause 3.2

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



Environmental Science

4041

Client: The Brownfield Consultancy
Client Address: Woodstock, Memorial Road,
Fenny Compton, Warwickshire,
CV47 2XU

Contact: Jim Twaddle
Site Address: Berry Hill Road Adderbury

Client Reference: BCS92
Job Number: 21-30761
Date Sampled: 20/12 - 20/12/2021
Date Received: 22/12/2021
Date Tested: 12/01/2022
Sampled By: Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test results

Laboratory Reference	Hole No.	Sample				Description	Remarks	WC %	Sample preparation / Oven temperature at the time of testing			
		Reference	Depth Top m	Depth Base m	Type							
2127799	WS1	Not Given	2.00	Not Given	D	Orangish brown slightly gravelly silty CLAY		38	Sample was quartered, oven dried at 109 °C			
2127800	WS2	Not Given	0.70	Not Given	D	Orangish brown slightly sandy gravelly silty CLAY		37	Sample was quartered, oven dried at 109 °C			
2127801	WS3	Not Given	0.80	Not Given	D	Brown slightly gravelly sandy CLAY		24	Sample was quartered, oven dried at 109 °C			
2126101	WS4	Not Given	2.00	Not Given	D	Yellowish brown slightly sandy CLAY		24	Sample was quartered, oven dried at 109 °C			
2126102	WS5	Not Given	0.80	Not Given	D	Yellowish brown slightly gravelly CLAY		39	Sample was quartered, oven dried at 109 °C			
2126103	WS5	Not Given	2.40	Not Given	D	Yellowish brown sandy silty CLAY		22	Sample was quartered, oven dried at 109 °C			

Comments:

Signed:



Anna Dudzinska
Deputy Head of Geo Office Section
for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

DETERMINATION OF PARTICLE SIZE DISTRIBUTION

Tested in Accordance with: BS 1377-2: 1990

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



Environmental Science

4041

Client: The Brownfield Consultancy
Client Address: Woodstock, Memorial Road,
Fenny Compton, Warwickshire,
CV47 2XU
Contact: Jim Twaddle
Site Address: Berry Hill Road Adderbury

Client Reference: BCS92
Job Number: 21-30761
Date Sampled: 20/12/2021
Date Received: 22/12/2021
Date Tested: 05/01/2022
Sampled By: Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference: 2126100

Hole No.: WS1

Sample Reference: Not Given

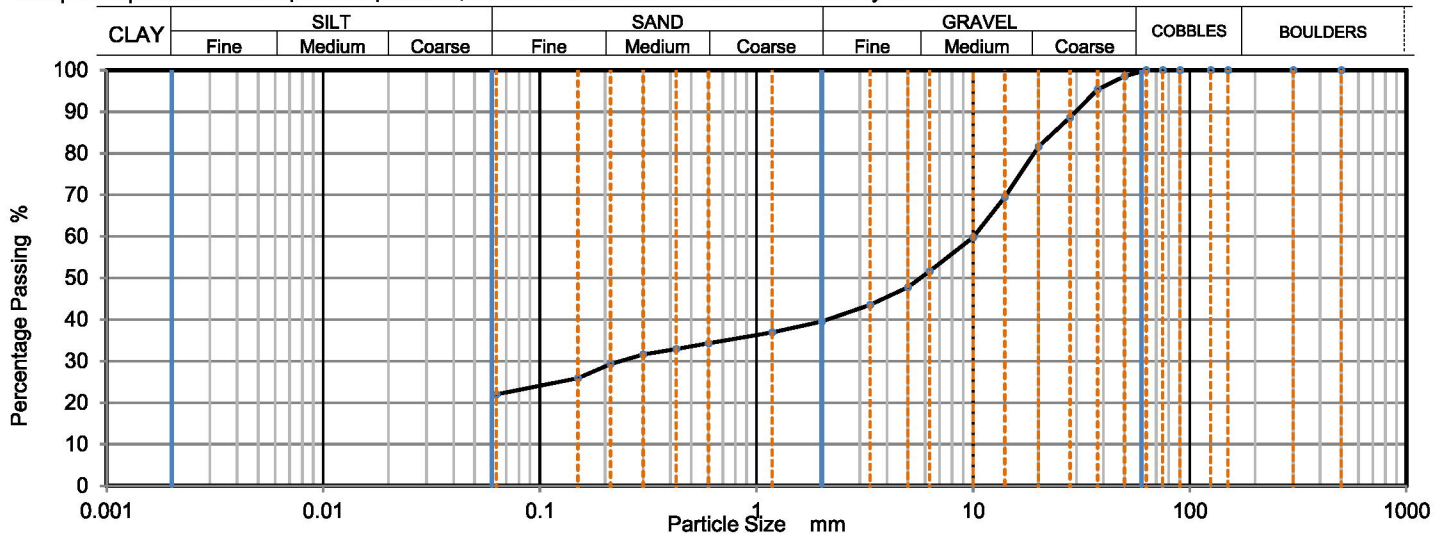
Sample Description: Brown sandy clayey GRAVEL

Sample Preparation: Sample was quartered, oven dried at 106.0 °C and broken down by hand.

Depth Top [m]: 1.00

Depth Base [m]: Not Given

Sample Type: B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100		
300	100		
150	100		
125	100		
90	100		
75	100		
63	100		
50	99		
37.5	95		
28	89		
20	82		
14	70		
10	60		
6.3	52		
5	48		
3.35	44		
2	40		
1.18	37		
0.6	34		
0.425	33		
0.3	32		
0.212	29		
0.15	26		
0.063	23		

Sample Proportions	% dry mass
Very coarse	0
Gravel	60
Sand	17
Fines <0.063mm	23

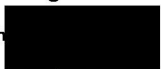
Grading Analysis	
D100	mm
D60	mm
D30	mm
D10	mm
Uniformity Coefficient	> 160
Curvature Coefficient	

Uniformity Coefficient calculated in accordance with BS EN ISO 14688-2:2018

Note: Tested in Accordance with BS1377:Part 2:1990, clause 9.2

Remarks:

Signed:



Anna Dudzinska
Deputy Head of Geo Office Section
for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

DETERMINATION OF PARTICLE SIZE DISTRIBUTION

Tested in Accordance with: BS 1377-2: 1990

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



Environmental Science

4041

Client: The Brownfield Consultancy
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Fenny Compton, Warwickshire,
CV47 2XU
Contact: Jim Twaddle
Site Address: Berry Hill Road Adderbury

Client Reference: BCS92
Job Number: 21-30761
Date Sampled: 20/12/2021
Date Received: 22/12/2021
Date Tested: 05/01/2022
Sampled By: Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference: 2126104

Hole No.: WS5

Sample Reference: Not Given

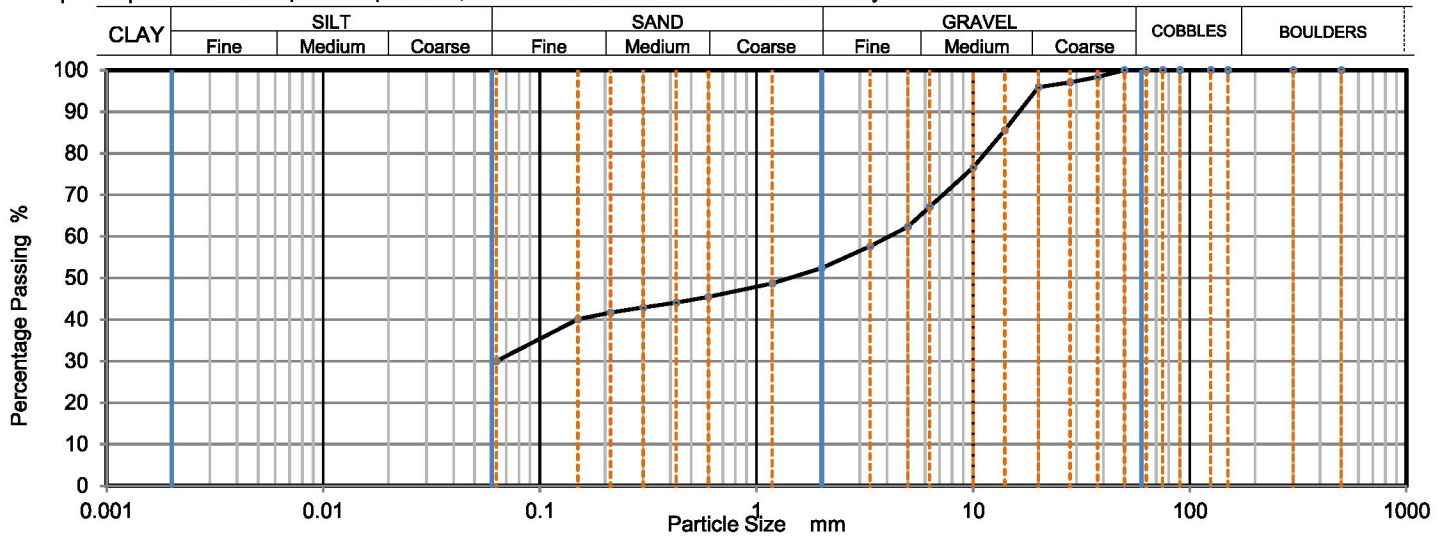
Sample Description: Yellowish brown sandy very clayey GRAVEL

Sample Preparation: Sample was quartered, oven dried at 106.5 °C and broken down by hand.

Depth Top [m]: 1.00

Depth Base [m]: Not Given

Sample Type: B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100		
300	100		
150	100		
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	98		
28	97		
20	96		
14	86		
10	77		
6.3	67		
5	62		
3.35	58		
2	52		
1.18	49		
0.6	46		
0.425	44		
0.3	43		
0.212	42		
0.15	40		
0.063	30		

Sample Proportions	% dry mass
Very coarse	0
Gravel	48
Sand	22
Fines <0.063mm	30

Grading Analysis		
D100	mm	50
D60	mm	4.1
D30	mm	
D10	mm	
Uniformity Coefficient		> 65
Curvature Coefficient		

Uniformity Coefficient calculated in accordance with BS EN ISO 14688-2:2018

Note: Tested in Accordance with BS1377:Part 2:1990, clause 9.2

Remarks:

Signed:



Anna Dudzinska
Deputy Head of Geo Office Section
for and on behalf of i2 Analytical Ltd

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APPENDIX D

Chemical Laboratory Analysis



Jim Twaddle
The Brownfield Consultancy
Woodstock
Memorial Road
Fenny Compton
Warwickshire
CV47 2XU

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: jim.twaddle@brownfieldconsultancy.co.uk

Analytical Report Number : 21-30802

Project / Site name:	Berry Hill Road, Adderbury	Samples received on:	22/12/2021
Your job number:	BC592	Samples instructed on/ Analysis started on:	22/12/2021
Your order number:		Analysis completed by:	07/01/2022
Report Issue Number:	1	Report issued on:	07/01/2022
Samples Analysed:	23 soil samples		

Signed: 

Joanna Wawrzeczko
Technical Reviewer (Reporting Team)
For & on behalf of i2 Analytical Ltd.

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

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

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

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

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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: 21-30802
 Project / Site name: Berry Hill Road, Adderbury

Lab Sample Number	2126355			2126356			2126357			2126358			2126359		
Sample Reference	WS1			WS1			WS1			WS1			WS1		
Sample Number	None Supplied			None Supplied			None Supplied			None Supplied			None Supplied		
Depth (m)	0.15			0.90			1.00			3.00			4.00		
Date Sampled	20/12/2021			20/12/2021			20/12/2021			20/12/2021			20/12/2021		
Time Taken	None Supplied			None Supplied			None Supplied			None Supplied			None Supplied		
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status												
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	
Moisture Content	%	0.01	NONE	16	20	20	22	18							
Total mass of sample received	kg	0.001	NONE	0.60	0.50	0.60	0.60	0.60							

Asbestos in Soil	Type	N/A	ISO 17025	-	-	-	-	-
Asbestos Analyst ID	N/A	N/A	N/A					

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	-	-	7.5	7.2	6.5
Total Sulphate as SO4	%	0.005	MCERTS	-	-	0.005	0.011	0.011
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	-	-	0.010	0.033	0.032
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	-	-	10.4	33.1	31.6
Total Sulphur	%	0.005	MCERTS	-	-	0.008	0.012	0.012

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	-	< 0.05	-	-	-
Acenaphthylene	mg/kg	0.05	MCERTS	-	< 0.05	-	-	-
Acenaphthene	mg/kg	0.05	MCERTS	-	< 0.05	-	-	-
Fluorene	mg/kg	0.05	MCERTS	-	< 0.05	-	-	-
Phenanthrene	mg/kg	0.05	MCERTS	-	< 0.05	-	-	-
Anthracene	mg/kg	0.05	MCERTS	-	< 0.05	-	-	-
Fluoranthene	mg/kg	0.05	MCERTS	-	< 0.05	-	-	-
Pyrene	mg/kg	0.05	MCERTS	-	< 0.05	-	-	-
Benzo(a)anthracene	mg/kg	0.05	MCERTS	-	< 0.05	-	-	-
Chrysene	mg/kg	0.05	MCERTS	-	< 0.05	-	-	-
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	-	< 0.05	-	-	-
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	-	< 0.05	-	-	-
Benzo(a)pyrene	mg/kg	0.05	MCERTS	-	< 0.05	-	-	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	-	< 0.05	-	-	-
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	-	< 0.05	-	-	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	< 0.05	-	-	-

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	-	< 0.80	-	-	-
-----------------------------	-------	-----	--------	---	--------	---	---	---

Analytical Report Number: 21-30802
 Project / Site name: Berry Hill Road, Adderbury

Lab Sample Number	2126355				2126356				2126357				2126358				2126359			
Sample Reference	WS1																			
Sample Number	None Supplied																			
Depth (m)	0.15				0.90				1.00				3.00				4.00			
Date Sampled	20/12/2021				20/12/2021				20/12/2021				20/12/2021				20/12/2021			
Time Taken	None Supplied																			
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status																	

Heavy Metals / Metalloids

Element	Units	Limit of detection	Accreditation Status	2126355	2126356	2126357	2126358	2126359
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	100	-	-	-	-
Barium (aqua regia extractable)	mg/kg	1	MCERTS	92	-	-	-	-
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	4.1	-	-	-	-
Boron (water soluble)	mg/kg	0.2	MCERTS	0.8	-	-	-	-
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	-	-	-	-
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	210	-	-	-	-
Copper (aqua regia extractable)	mg/kg	1	MCERTS	29	-	-	-	-
Lead (aqua regia extractable)	mg/kg	1	MCERTS	60	-	-	-	-
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	-	-	-	-
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	78	-	-	-	-
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	-	-	-	-
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	270	-	-	-	-
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	180	-	-	-	-

Petroleum Hydrocarbons

Parameter	Units	Limit of detection	Accreditation Status	2126355	2126356	2126357	2126358	2126359
TPH5 (C6 - C10) <small>HS_ID_TOTAL</small>	mg/kg	0.1	MCERTS	-	< 0.1	-	-	-
TPH5 (C10 - C20) <small>EH_CU_ID_TOTAL</small>	mg/kg	10	MCERTS	-	< 10	-	-	-
TPH5 (C20 - C30) <small>EH_CU_ID_TOTAL</small>	mg/kg	10	NONE	-	< 10	-	-	-
TPH5 (C30 - C40) <small>EH_CU_ID_TOTAL</small>	mg/kg	10	NONE	-	< 10	-	-	-
TPH5 (C6 - C40) <small>EH_CU+HS_ID_TOTAL</small>	mg/kg	10	NONE	-	< 10	-	-	-

U/S = Unsuitable Sample I/S = Insufficient Sample

Analytical Report Number: 21-30802
Project / Site name: Berry Hill Road, Adderbury

Lab Sample Number				2126360	2126361	2126362	2126363	2126364
Sample Reference				WS2	WS2	WS2	WS2	WS3
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.10	1.00	2.00	1.50	0.90
Date Sampled				20/12/2021	20/12/2021	20/12/2021	20/12/2021	20/12/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	16	22	24	26	15
Total mass of sample received	kg	0.001	NONE	0.60	1.5	0.60	0.50	0.50

Asbestos in Soil	Type	N/A	ISO 17025	-	-	-	-	-
Asbestos Analyst ID	N/A	N/A	N/A					

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	-	-	7.6	-	-
Total Sulphate as SO4	%	0.005	MCERTS	-	-	0.012	-	-
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	-	-	0.043	-	-
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	-	-	43.1	-	-
Total Sulphur	%	0.005	MCERTS	-	-	0.010	-	-

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	-	< 0.05	-	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	-	< 0.05	-	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	-	< 0.05	-	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	-	< 0.05	-	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	-	< 0.05	-	< 0.05	< 0.05
Anthracene	mg/kg	0.05	MCERTS	-	< 0.05	-	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	-	< 0.05	-	< 0.05	< 0.05
Pyrene	mg/kg	0.05	MCERTS	-	< 0.05	-	< 0.05	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	-	< 0.05	-	< 0.05	< 0.05
Chrysene	mg/kg	0.05	MCERTS	-	< 0.05	-	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	-	< 0.05	-	< 0.05	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	-	< 0.05	-	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	-	< 0.05	-	< 0.05	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	-	< 0.05	-	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	-	< 0.05	-	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	< 0.05	-	< 0.05	< 0.05

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	-	< 0.80	-	< 0.80	< 0.80
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Analytical Report Number: 21-30802
 Project / Site name: Berry Hill Road, Adderbury

Lab Sample Number				2126360	2126361	2126362	2126363	2126364
Sample Reference				WS2	WS2	WS2	WS2	WS3
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.10	1.00	2.00	1.50	0.90
Date Sampled				20/12/2021	20/12/2021	20/12/2021	20/12/2021	20/12/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
				Heavy Metals / Metalloids				
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	110	220	-	280	81
Barium (aqua regia extractable)	mg/kg	1	MCERTS	88	95	-	91	74
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	4.5	12	-	10	2.8
Boron (water soluble)	mg/kg	0.2	MCERTS	0.4	1.2	-	0.3	0.3
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	220	630	-	530	140
Copper (aqua regia extractable)	mg/kg	1	MCERTS	23	8.5	-	17	11
Lead (aqua regia extractable)	mg/kg	1	MCERTS	61	23	-	28	17
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	-	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	77	170	-	170	49
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	-	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	300	770	-	770	190
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	180	150	-	240	100

Petroleum Hydrocarbons

TPH5 (C6 - C10) <small>HS_ID_TOTAL</small>	mg/kg	0.1	MCERTS	-	< 0.1	-	< 0.1	-
TPH5 (C10 - C20) <small>EH_CU_ID_TOTAL</small>	mg/kg	10	MCERTS	-	< 10	-	< 10	-
TPH5 (C20 - C30) <small>EH_CU_ID_TOTAL</small>	mg/kg	10	NONE	-	< 10	-	< 10	-
TPH5 (C30 - C40) <small>EH_CU_ID_TOTAL</small>	mg/kg	10	NONE	-	< 10	-	< 10	-
TPH5 (C6 - C40) <small>EH_CU+HS_ID_TOTAL</small>	mg/kg	10	NONE	-	< 10	-	< 10	-

U/S = Unsuitable Sample I/S = Insufficient Sample

Analytical Report Number: 21-30802
Project / Site name: Berry Hill Road, Adderbury

Lab Sample Number				2126365	2126366	2126367	2126368	2126369
Sample Reference				WS4	WS4	WS4	WS5	WS5
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.10	1.80	0.50	0.40	0.10
Date Sampled				20/12/2021	20/12/2021	20/12/2021	20/12/2021	20/12/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	14	17	21	22	15
Total mass of sample received	kg	0.001	NONE	0.50	0.50	0.50	0.50	0.60

Asbestos in Soil	Type	N/A	ISO 17025	-	-	-	-	-
Asbestos Analyst ID	N/A	N/A	N/A					

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	-	7.5	-	6.8	-
Total Sulphate as SO ₄	%	0.005	MCERTS	-	0.008	-	0.065	-
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	-	0.018	-	0.010	-
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	-	17.5	-	10.2	-
Total Sulphur	%	0.005	MCERTS	-	0.005	-	0.048	-

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	-	-	< 0.05	< 0.05	-
Acenaphthylene	mg/kg	0.05	MCERTS	-	-	< 0.05	< 0.05	-
Acenaphthene	mg/kg	0.05	MCERTS	-	-	< 0.05	< 0.05	-
Fluorene	mg/kg	0.05	MCERTS	-	-	< 0.05	< 0.05	-
Phenanthrene	mg/kg	0.05	MCERTS	-	-	< 0.05	< 0.05	-
Anthracene	mg/kg	0.05	MCERTS	-	-	< 0.05	< 0.05	-
Fluoranthene	mg/kg	0.05	MCERTS	-	-	< 0.05	< 0.05	-
Pyrene	mg/kg	0.05	MCERTS	-	-	< 0.05	< 0.05	-
Benzo(a)anthracene	mg/kg	0.05	MCERTS	-	-	< 0.05	< 0.05	-
Chrysene	mg/kg	0.05	MCERTS	-	-	< 0.05	< 0.05	-
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	-	-	< 0.05	< 0.05	-
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	-	-	< 0.05	< 0.05	-
Benzo(a)pyrene	mg/kg	0.05	MCERTS	-	-	< 0.05	< 0.05	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	-	-	< 0.05	< 0.05	-
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	-	-	< 0.05	< 0.05	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	-	< 0.05	< 0.05	-

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	-	-	< 0.80	< 0.80	-

Analytical Report Number: 21-30802
 Project / Site name: Berry Hill Road, Adderbury

Lab Sample Number				2126365	2126366	2126367	2126368	2126369
Sample Reference				WS4	WS4	WS4	WS5	WS5
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.10	1.80	0.50	0.40	0.10
Date Sampled				20/12/2021	20/12/2021	20/12/2021	20/12/2021	20/12/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	150	94	220	140	180
Barium (aqua regia extractable)	mg/kg	1	MCERTS	100	32	50	76	78
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	6.1	7.5	11	5.1	6.8
Boron (water soluble)	mg/kg	0.2	MCERTS	1.0	0.3	1.6	0.9	1.4
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	310	550	580	270	350
Copper (aqua regia extractable)	mg/kg	1	MCERTS	25	15	6.7	25	20
Lead (aqua regia extractable)	mg/kg	1	MCERTS	75	38	21	60	63
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	100	160	130	88	110
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	400	910	760	350	450
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	200	340	93	190	190

Petroleum Hydrocarbons

TPH5 (C6 - C10) <small>HS_ID_TOTAL</small>	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH5 (C10 - C20) <small>EH_CU_ID_TOTAL</small>	mg/kg	10	MCERTS	-	-	-	-	-
TPH5 (C20 - C30) <small>EH_CU_ID_TOTAL</small>	mg/kg	10	NONE	-	-	-	-	-
TPH5 (C30 - C40) <small>EH_CU_ID_TOTAL</small>	mg/kg	10	NONE	-	-	-	-	-
TPH5 (C6 - C40) <small>EH_CU+HS_ID_TOTAL</small>	mg/kg	10	NONE	-	-	-	-	-

U/S = Unsuitable Sample I/S = Insufficient Sample

Analytical Report Number: 21-30802
 Project / Site name: Berry Hill Road, Adderbury

Lab Sample Number	2126370			2126371		2126372		2126373		2126374	
Sample Reference	HP1			HP2		HP3		HP4		HP4	
Sample Number	None Supplied			None Supplied		None Supplied		None Supplied		None Supplied	
Depth (m)	0.10			0.05		0.05		0.05		0.15	
Date Sampled	20/12/2021			20/12/2021		20/12/2021		20/12/2021		20/12/2021	
Time Taken	None Supplied			None Supplied		None Supplied		None Supplied		None Supplied	
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status								
Stone Content	%	0.1	NONE	-	-	-	< 0.1	-	-	-	-
Moisture Content	%	0.01	NONE	-	-	-	14	-	-	-	-
Total mass of sample received	kg	0.001	NONE	-	-	-	0.50	-	-	-	-

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

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	-	-	-	-	-
Total Sulphate as SO4	%	0.005	MCERTS	-	-	-	-	-
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	-	-	-	-	-
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	-	-	-	-	-
Total Sulphur	%	0.005	MCERTS	-	-	-	-	-

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	-	-	-	-	-
Acenaphthylene	mg/kg	0.05	MCERTS	-	-	-	-	-
Acenaphthene	mg/kg	0.05	MCERTS	-	-	-	-	-
Fluorene	mg/kg	0.05	MCERTS	-	-	-	-	-
Phenanthrene	mg/kg	0.05	MCERTS	-	-	-	-	-
Anthracene	mg/kg	0.05	MCERTS	-	-	-	-	-
Fluoranthene	mg/kg	0.05	MCERTS	-	-	-	-	-
Pyrene	mg/kg	0.05	MCERTS	-	-	-	-	-
Benzo(a)anthracene	mg/kg	0.05	MCERTS	-	-	-	-	-
Chrysene	mg/kg	0.05	MCERTS	-	-	-	-	-
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	-	-	-	-	-
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	-	-	-	-	-
Benzo(a)pyrene	mg/kg	0.05	MCERTS	-	-	-	-	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	-	-	-	-	-
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	-	-	-	-	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	-	-	-	-

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	-	-	-	-	-
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Analytical Report Number: 21-30802
 Project / Site name: Berry Hill Road, Adderbury

Lab Sample Number				2126370	2126371	2126372	2126373	2126374
Sample Reference				HP1	HP2	HP3	HP4	HP4
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.10	0.05	0.05	0.05	0.15
Date Sampled				20/12/2021	20/12/2021	20/12/2021	20/12/2021	20/12/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	8.6	-
Barium (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	3.2	-
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	-	-	-	0.11	-
Boron (water soluble)	mg/kg	0.2	MCERTS	-	-	-	< 0.2	-
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	-	-	-	< 0.2	-
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	4.1	-
Copper (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	6.0	-
Lead (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	1.8	-
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	-	-	-	< 0.3	-
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	2.1	-
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	< 1.0	-
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	10	-
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	5.2	-

Petroleum Hydrocarbons

Parameter	Units	Limit of detection	Accreditation Status					
TPH5 (C6 - C10) <small>HS_ID_TOTAL</small>	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH5 (C10 - C20) <small>EH_CU_ID_TOTAL</small>	mg/kg	10	MCERTS	-	-	-	-	-
TPH5 (C20 - C30) <small>EH_CU_ID_TOTAL</small>	mg/kg	10	NONE	-	-	-	-	-
TPH5 (C30 - C40) <small>EH_CU_ID_TOTAL</small>	mg/kg	10	NONE	-	-	-	-	-
TPH5 (C6 - C40) <small>EH_CU+HS_ID_TOTAL</small>	mg/kg	10	NONE	-	-	-	-	-

U/S = Unsuitable Sample I/S = Insufficient Sample

Analytical Report Number: 21-30802
 Project / Site name: Berry Hill Road, Adderbury

Lab Sample Number				2126375	2126376	2126377
Sample Reference				HP5	HP6	HP6
Sample Number				None Supplied	None Supplied	None Supplied
Depth (m)				0.70	0.05	0.15
Date Sampled				20/12/2021	20/12/2021	20/12/2021
Time Taken				None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status			
Stone Content	%	0.1	NONE	< 0.1	< 0.1	-
Moisture Content	%	0.01	NONE	14	6.4	-
Total mass of sample received	kg	0.001	NONE	0.60	0.60	-

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

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	-	-	-
Total Sulphate as SO4	%	0.005	MCERTS	-	-	-
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	-	-	-
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	-	-	-
Total Sulphur	%	0.005	MCERTS	-	-	-

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	-	-	-
Acenaphthylene	mg/kg	0.05	MCERTS	-	-	-
Acenaphthene	mg/kg	0.05	MCERTS	-	-	-
Fluorene	mg/kg	0.05	MCERTS	-	-	-
Phenanthrene	mg/kg	0.05	MCERTS	-	-	-
Anthracene	mg/kg	0.05	MCERTS	-	-	-
Fluoranthene	mg/kg	0.05	MCERTS	-	-	-
Pyrene	mg/kg	0.05	MCERTS	-	-	-
Benzo(a)anthracene	mg/kg	0.05	MCERTS	-	-	-
Chrysene	mg/kg	0.05	MCERTS	-	-	-
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	-	-	-
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	-	-	-
Benzo(a)pyrene	mg/kg	0.05	MCERTS	-	-	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	-	-	-
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	-	-	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	-	-

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	-	-	-
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Analytical Report Number: 21-30802
 Project / Site name: Berry Hill Road, Adderbury

Lab Sample Number				2126375	2126376	2126377
Sample Reference				HP5	HP6	HP6
Sample Number				None Supplied	None Supplied	None Supplied
Depth (m)				0.70	0.05	0.15
Date Sampled				20/12/2021	20/12/2021	20/12/2021
Time Taken				None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status			
Heavy Metals / Metalloids						
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	140	20	-
Barium (aqua regia extractable)	mg/kg	1	MCERTS	100	220	-
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	5.4	1.3	-
Boron (water soluble)	mg/kg	0.2	MCERTS	0.7	0.5	-
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	-
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	290	110	-
Copper (aqua regia extractable)	mg/kg	1	MCERTS	21	25	-
Lead (aqua regia extractable)	mg/kg	1	MCERTS	40	22	-
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	-
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	100	24	-
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	-
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	360	120	-
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	210	89	-

Petroleum Hydrocarbons

TPH5 (C6 - C10) <small>HS_ID_TOTAL</small>	mg/kg	0.1	MCERTS	-	-	-
TPH5 (C10 - C20) <small>EH_CU_ID_TOTAL</small>	mg/kg	10	MCERTS	-	-	-
TPH5 (C20 - C30) <small>EH_CU_ID_TOTAL</small>	mg/kg	10	NONE	-	-	-
TPH5 (C30 - C40) <small>EH_CU_ID_TOTAL</small>	mg/kg	10	NONE	-	-	-
TPH5 (C6 - C40) <small>EH_CU+HS_ID_TOTAL</small>	mg/kg	10	NONE	-	-	-

U/S = Unsuitable Sample I/S = Insufficient Sample

Analytical Report Number : 21-30802

Project / Site name: Berry Hill Road, Adderbury

* 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 *
2126355	WS1	None Supplied	0.15	Brown loam and clay with gravel and vegetation.
2126356	WS1	None Supplied	0.9	Brown clay and sand with gravel.
2126357	WS1	None Supplied	1	Brown clay and sand with gravel.
2126358	WS1	None Supplied	3	Brown clay and sand with gravel and vegetation.
2126359	WS1	None Supplied	4	Brown clay and sand with gravel.
2126360	WS2	None Supplied	0.1	Brown loam and clay with gravel and vegetation.
2126361	WS2	None Supplied	1	Brown loam and clay with gravel and vegetation.
2126362	WS2	None Supplied	2	Brown clay and loam with gravel.
2126363	WS2	None Supplied	1.5	Brown clay and sand with gravel.
2126364	WS3	None Supplied	0.9	Brown clay and sand with gravel.
2126365	WS4	None Supplied	0.1	Brown loam and clay with gravel.
2126366	WS4	None Supplied	1.8	Light brown clay and loam.
2126367	WS4	None Supplied	0.5	Brown clay and sand with gravel.
2126368	WS5	None Supplied	0.4	Brown loam and clay with gravel and vegetation.
2126369	WS5	None Supplied	0.1	Brown loam and clay with vegetation.
2126373	HP4	None Supplied	0.05	Light brown sand.
2126375	HP5	None Supplied	0.7	Brown loam and clay with vegetation.
2126376	HP6	None Supplied	0.05	Brown loam and clay with gravel.

Analytical Report Number : 21-30802

Project / Site name: Berry Hill Road, Adderbury

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperin staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
TPHS (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method with silica gel split/clean up.	L076-PL	D	MCERTS
Total Sulphate in soil as %	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
Total Sulphur in soil as %	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
Sulphate, water soluble, in soil	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.

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

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

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.

Analytical Report Number : 21-30802

Project / Site name: Berry Hill Road, Adderbury

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
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Information in Support of Analytical Results

List of HWOL Acronyms and Operators

Acronym	Descriptions
HS	Headspace Analysis
MS	Mass spectrometry
FID	Flame Ionisation Detector
GC	Gas Chromatography
EH	Extractable Hydrocarbons (i.e. everything extracted by the solvent(s))
CU	Clean-up - e.g. by Florisil®, silica gel
1D	GC - Single coil/column gas chromatography
2D	GC-GC - Double coil/column gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics
AR	Aromatics
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - understore to separate acronyms (exception for +)
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total



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Analytical Report Number : 22-31584

Project / Site name:	Berry Hill Road, Adderbury	Samples received on:	22/12/2021
Your job number:	BC592	Samples instructed on/ Analysis started on:	07/01/2022
Your order number:		Analysis completed by:	21/01/2022
Report Issue Number:	1	Report issued on:	21/01/2022
Samples Analysed:	2 soil samples		

Signed 

Karolina Marek
PL Head of Reporting Team
For & on behalf of i2 Analytical Ltd.

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

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

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

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

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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: 22-31584

Project / Site name: Berry Hill Road, Adderbury

Lab Sample Number				2130402	2130403
Sample Reference				WS1	WS4
Sample Number				None Supplied	None Supplied
Depth (m)				0.15	0.50
Date Sampled				20/12/2021	20/12/2021
Time Taken				None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status		
Stone Content	%	0.1	NONE	35	26
Moisture Content	%	0.01	NONE	17	22
Total mass of sample received	kg	0.001	NONE	0.60	0.50

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	100	210
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PBET Results (Bioaccessible Fraction)

Arsenic (Stomach)	%	0.5	NONE	13.1	4.6
Arsenic (Intestine 1)	%	0.5	NONE	15.9	6.3
Arsenic (Intestine 2)	%	0.5	NONE	16.1	7.1

Bioaccessible Fraction %	Maximum % BAF	16.1 % (I2)	7.1 % (I2)
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U/S = Unsuitable Sample I/S = Insufficient Sample



Analytical Report Number : 22-31584

Project / Site name: Berry Hill Road, Adderbury

* 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 *
2130402	WS1	None Supplied	0.15	Brown loam and clay with gravel and vegetation.
2130403	WS4	None Supplied	0.5	Brown clay and sand with gravel.

Analytical Report Number : 22-31584

Project / Site name: Berry Hill Road, Adderbury

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	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.	L019-UK/PL	D	NONE
PBET	In House Method	In house method based on Ruby et.al.		D	NONE

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.

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

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

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.



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Analytical Report Number : 21-30960

Project / Site name:	Berry Hill Road, Adderbury	Samples received on:	22/12/2021
Your job number:		Samples instructed on/ Analysis started on:	22/12/2021
Your order number:	BC592	Analysis completed by:	05/01/2022
Report Issue Number:	1	Report issued on:	05/01/2022
Samples Analysed:	10:1 WAC sample		

Signature

Izabela Wójcik
Technical Reviewer (Reporting Team)
For & on behalf of i2 Analytical Ltd.

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

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

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

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

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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.

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Waste Acceptance Criteria Analytical Results						
Report No:	21-30960					
				Client: BROWNFIELD		
Location	Berry Hill Road, Adderbury					
Lab Reference (Sample Number)	2127185 / 2127186			Landfill Waste Acceptance Criteria		
Sampling Date	20/12/2021			Limits		
Sample ID	WS2			Inert Waste Landfill	Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill	Hazardous Waste Landfill
Depth (m)	1.00					
Solid Waste Analysis						
TOC (%)**	0.2			3%	5%	6%
Loss on Ignition (%) **	10.2			--	--	10%
BTEX (µg/kg) **	< 10			6000	--	--
Sum of PCBs (mg/kg) **	< 0.007			1	--	--
Mineral Oil (mg/kg) <small>EH, ID, CU, AL</small>	< 10			500	--	--
Total PAH (WAC-17) (mg/kg)	< 0.85			100	--	--
pH (units)**	7.0			--	>6	--
Acid Neutralisation Capacity (mmol / kg)	0.00			--	To be evaluated	To be evaluated
Eluate Analysis						
	10:1		10:1	Limit values for compliance leaching test		
(BS EN 12457 - 2 preparation utilising end over end leaching procedure)	mg/l		mg/kg	using BS EN 12457-2 at L/S 10 l/kg (mg/kg)		
Arsenic *	0.0065		0.0485	0.5	2	25
Barium *	0.0016		0.0121	20	100	300
Cadmium *	< 0.0001		< 0.0008	0.04	1	5
Chromium *	0.0022		0.017	0.5	10	70
Copper *	0.0029		0.022	2	50	100
Mercury *	< 0.0005		< 0.0050	0.01	0.2	2
Molybdenum *	< 0.0004		< 0.0040	0.5	10	30
Nickel *	0.0039		0.029	0.4	10	40
Lead *	0.0022		0.017	0.5	10	50
Antimony *	< 0.0017		< 0.017	0.06	0.7	5
Selenium *	< 0.0040		< 0.040	0.1	0.5	7
Zinc *	0.012		0.092	4	50	200
Chloride *	0.23		1.7	800	15000	25000
Fluoride	0.35		2.6	10	150	500
Sulphate *	2.7		20	1000	20000	50000
TDS*	37		270	4000	60000	100000
Phenol Index (Monohydric Phenols) *	< 0.010		< 0.10	1	-	-
DOC	4.08		30.6	500	800	1000
Leach Test Information						
Stone Content (%)	< 0.1					
Sample Mass (kg)	1.5					
Dry Matter (%)	78					
Moisture (%)	22					
Results are expressed on a dry weight basis, after correction for moisture content where applicable. * = UKAS accredited (liquid eluate analysis only)						
Stated limits are for guidance only and i2 cannot be held responsible for any discrepancies with current legislation ** = MCERTS accredited						

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes as defined by the Waste (England and Wales) Regulations 2011 (as amended) and EA Guidance WM3. This analysis is only applicable for landfill acceptance criteria (The Environmental Permitting (England and Wales) Regulations) and does not give any indication as to whether a waste may be hazardous or non-hazardous.



Analytical Report Number : 21-30960
Project / Site name: Berry Hill Road, Adderbury

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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 *
2127185	WS2	None Supplied	1	Brown loam and clay with gravel and vegetation.

Analytical Report Number : 21-30960
Project / Site name: Berry Hill Road, Adderbury

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
BS EN 12457-2 (10:1) Leachate Prep	10:1 (as received, moisture adjusted) end over end extraction with water for 24 hours. Eluate filtered prior to analysis.	In-house method based on BSEN12457-2.	L043-PL	W	NONE
Acid neutralisation capacity of soil	Determination of acid neutralisation capacity by addition of acid or alkali followed by electronic probe.	In-house method based on Guidance an Sampling and Testing of Wastes to Meet Landfill Waste Acceptance"	L046-PL	W	NONE
Loss on ignition of soil @ 450oC	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace.	In house method.	L047-PL	D	MCERTS
Mineral Oil (Soil) C10 - C40	Determination of mineral oil fraction extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L076-PL	D	NONE
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Speciated WAC-17 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270. MCERTS accredited except Coronene.	L064-PL	D	NONE
PCB's By GC-MS in soil	Determination of PCB by extraction with acetone and hexane followed by GC-MS.	In-house method based on USEPA 8082	L027-PL	D	MCERTS
pH at 20oC in soil	Determination of pH in soil by addition of water followed by electrometric measurement.	In house method.	L005-PL	W	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L009-PL	D	MCERTS
BTEX in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Total BTEX in soil (Poland)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073-PL	W	MCERTS
Metals in leachate by ICP-OES	Determination of metals in leachate by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil"	L039-PL	W	ISO 17025
Chloride 10:1 WAC	Determination of Chloride colorimetrically by discrete analyser.	In house based on MEWAM Method ISBN 0117516260.	L082-PL	W	ISO 17025
Fluoride 10:1 WAC	Determination of fluoride in leachate by 1:1ratio with a buffer solution followed by Ion Selective Electrode.	In-house method based on Use of Total Ionic Strength Adjustment Buffer for Electrode Determination"	L033B-PL	W	ISO 17025
Sulphate 10:1 WAC	Determination of sulphate in leachate by ICP-OES	In-house method based on MEWAM 1986 Methods for the Determination of Metals in Soil"	L039-PL	W	ISO 17025
Total dissolved solids 10:1 WAC	Determination of total dissolved solids in water by EC probe using a factor of 0.6.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L004-PL	W	ISO 17025

Analytical Report Number : 21-30960
Project / Site name: Berry Hill Road, Adderbury

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Monohydric phenols 10:1 WAC	Determination of phenols in leachate by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080-PL	W	ISO 17025
Dissolved organic carbon 10:1 WAC	Determination of dissolved inorganic carbon in leachate by TOC/DOC NDIR Analyser.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037-PL	W	NONE

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.

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

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

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.

Information in Support of Analytical Results

List of HWOL Acronyms and Operators

Acronym	Descriptions
HS	Headspace Analysis
MS	Mass spectrometry
FID	Flame Ionisation Detector
GC	Gas Chromatography
EH	Extractable Hydrocarbons (i.e. everything extracted by the solvent(s))
CU	Clean-up - e.g. by Florisil®, silica gel
1D	GC - Single coil/column gas chromatography
2D	GC-GC - Double coil/column gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics
AR	Aromatics
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - understore to separate acronyms (exception for +)
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total

APPENDIX E

Soakaway Results

The Brownfield Consultancy	SOIL INFILTRATION TEST
Woodstock Memorial Road Fenny Compton CV47 2XU Tel: 07852881086	Project: Berry Hill Road, Adderbury
	Project No: BC592

Test Location: SA1

Test No: 1

Date: 21.12.21

Water level during test

Time mins	Depth m bgl
0	0.870
2	1.020
3	1.100
5	1.200
8	1.330
10	1.400

Trial pit dimensions

depth (m)	1.50
length (m)	2.30
width (m)	0.47

$$f = \frac{V_p}{\alpha_p \times t_p}$$

f = soil infiltration rate

V_p = volume of water from 75% to 25% effective depth

α_p = Internal surface area at 50% effective depth

t_p = time for the water level to fall from 75% to 25% effective depth

time at 75% effective depth (mins)

2

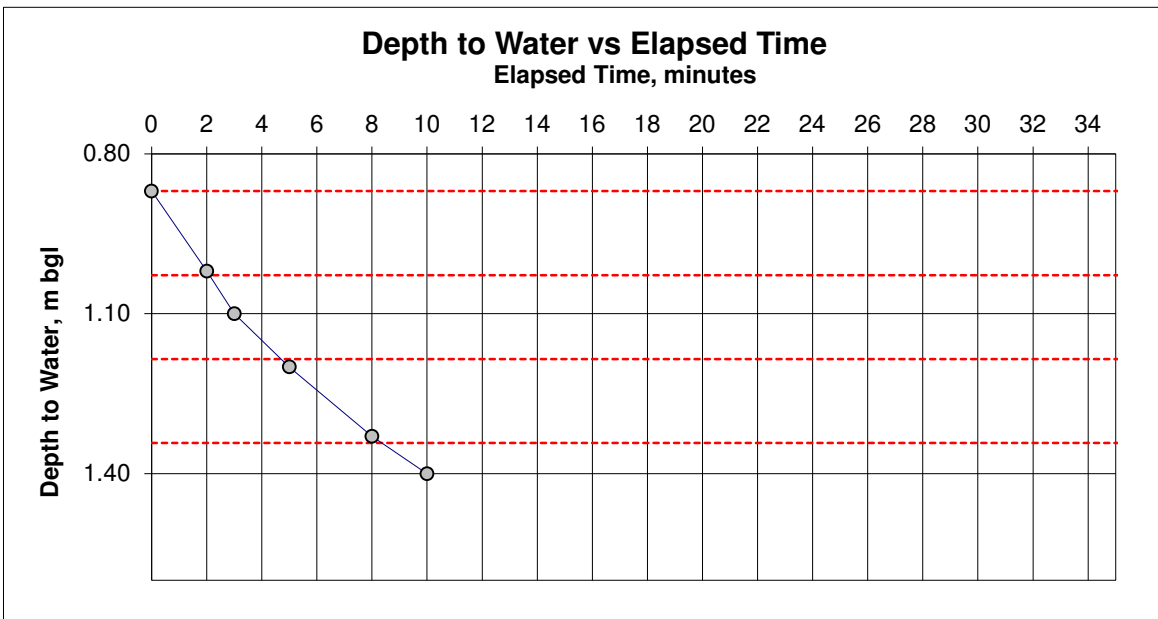
time at 25% effective depth (mins)

8

(from graph)

Calculated Soil Infiltration Rate =

2.8E-04 m/sec



**Woodstock
 Memorial Road
 Fenny Compton
 CV47 2XU
 Tel: 07852881086**

Project: Berry Hill Road, Adderbury
Project No: BC592

Test Location: SA1 Test No: 2 Date: 21.12.21

Water level during test

Time mins	Depth m bgl
0	0.680
4	0.930
7	1.070
10	1.200
14	1.310
17	1.400

Trial pit dimensions

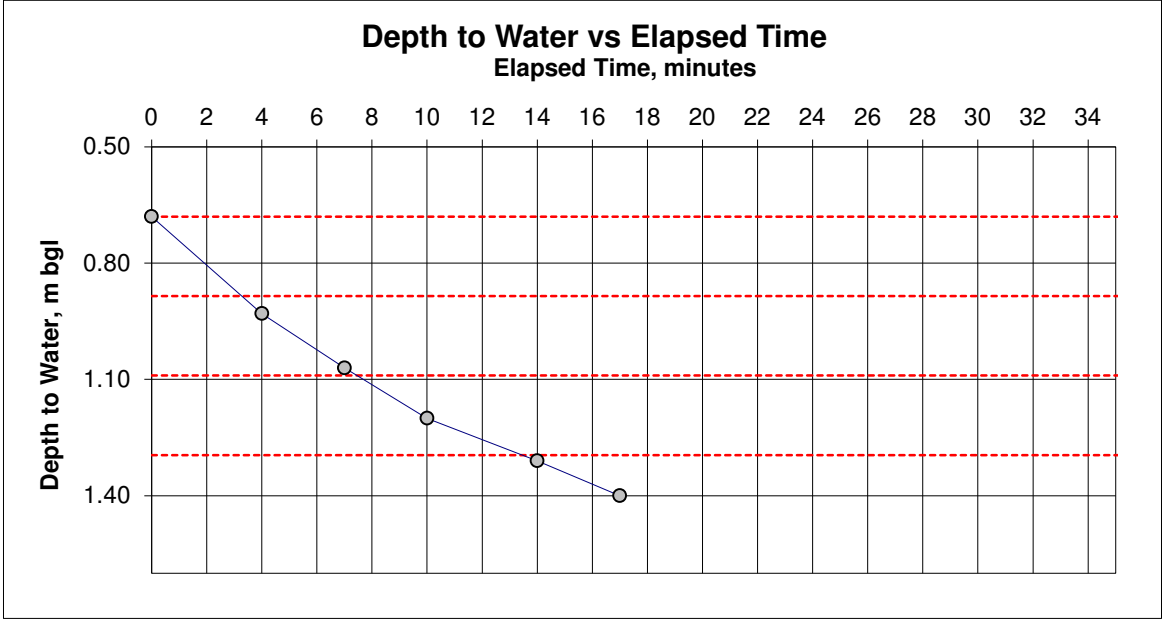
depth (m)	1.50
length (m)	2.30
width (m)	0.47

$$f = \frac{V_p}{\alpha_p \times t_p}$$

f = soil infiltration rate
V_p = volume of water from 75% to 25% effective depth
α_p = Internal surface area at 50% effective depth
t_p = time for the water level to fall from 75% to 25% effective depth

time at 75% effective depth (mins)	3.5
time at 25% effective depth (mins)	14
(from graph)	

Calculated Soil Infiltration Rate = 1.8E-04 m/sec



The Brownfield Consultancy	SOIL INFILTRATION TEST
Woodstock Memorial Road Fenny Compton CV47 2XU Tel: 07852881086	Project: Berry Hill Road, Adderbury
	Project No: BC592

Test Location: SA1

Test No: 3

Date: 21.12.21

Water level during test

Time mins	Depth m bgl
0	0.460
3	0.660
5	0.750
10	0.980
14	1.100
20	1.270
23	1.380

Trial pit dimensions

depth (m)	1.50
length (m)	2.30
width (m)	0.47

$$f = \frac{V_p}{\alpha_p \times t_p}$$

f = soil infiltration rate

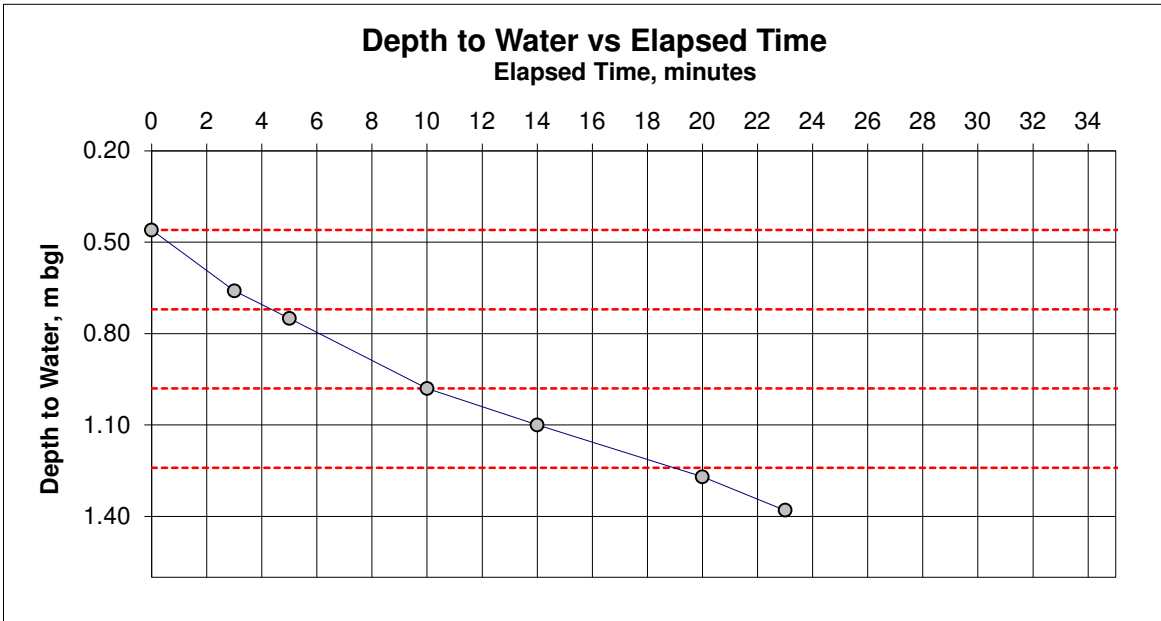
V_p = volume of water from 75% to 25% effective depth

α_p = Internal surface area at 50% effective depth

t_p = time for the water level to fall from 75% to 25% effective depth

time at 75% effective depth (mins) 4.5
time at 25% effective depth (mins) 19
(from graph)

Calculated Soil Infiltration Rate = 1.4E-04 m/sec



The Brownfield Consultancy	SOIL INFILTRATION TEST
Woodstock Memorial Road Fenny Compton CV47 2XU Tel: 07852881086	Project: Berry Hill Road, Adderbury
	Project No: BC592

Test Location: SA2

Test No: 1

Date: 21.12.21

Water level during test

Time mins	Depth m bgl
0	0.420
17	0.500
72	0.640
85	0.660
105	0.680
122	0.700
142	0.740
158	0.760
180	0.790
227	0.840
277	0.890
294	0.900

Trial pit dimensions

depth (m)	1.50
length (m)	1.80
width (m)	0.45

$$f = \frac{V_p}{\alpha_p \times t_p}$$

f = soil infiltration rate

V_p = volume of water from 75% to 25% effective depth

α_p = Internal surface area at 50% effective depth

t_p = time for the water level to fall from 75% to 25% effective depth

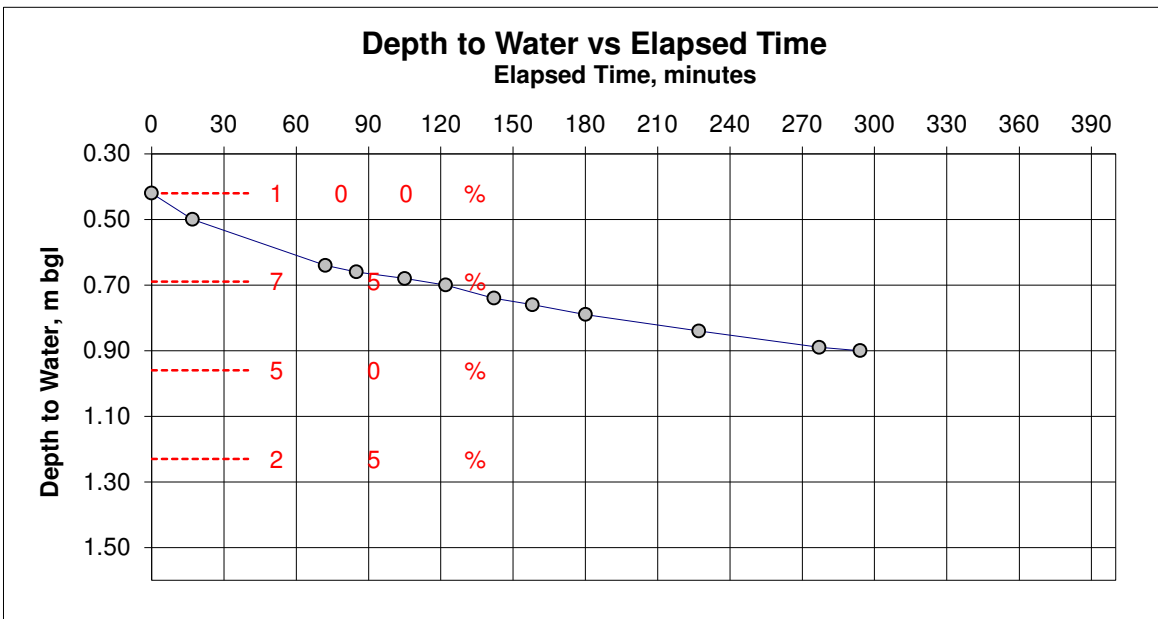
time at 75% effective depth (mins)

time at 25% effective depth (mins)

(from graph)

Calculated Soil Infiltration Rate =

- m/sec



APPENDIX F

Gas Monitoring Results

GAS MONITORING DATA

The Brownfield Consultancy

Site: **Berry Hill Road, Adderbury**

Operator: **J Twaddle**

Project: **BC592**

Date: **02.01.2022**

Weather: **Warm, overcast**

Monitoring Location	Standpipe diameter (mm)	Standpipe Depth (m bgl)	Water Level (m bgl)	Atmos. Pressure (mb)	Initial Flow Rate (litres/hr)	Temp (°C)	Reading Duration (s)	CH ₄ (% v/v)	CO ₂ (% v/v)	O ₂ (% v/v)	Notes
WS1	50	4.01	Dry	997	<0.1		30	<0.1	2.1	19.0	
							60	<0.1	2.1	18.6	
							120	<0.1	2.1	18.6	
							180	<0.1	2.1	18.6	
							240	<0.1	2.1	18.6	
							300	<0.1	2.1	18.6	
WS2	50	3.96	Dry	997	<0.1		30	<0.1	1.9	18.9	
							60	<0.1	2.0	18.5	
							120	<0.1	2.0	18.4	
							180	<0.1	2.0	18.4	
							240	<0.1	2.0	18.4	
							300	<0.1	2.0	18.4	
WS3	50	4.04	Dry	997	<0.1		30	<0.1	0.7	19.4	
							60	<0.1	0.7	19.4	
							120	<0.1	0.7	19.4	
							180	<0.1	0.7	19.4	
							240	<0.1	0.7	19.4	
							300	<0.1	0.7	19.4	

APPENDIX G

Photographs

Photographs



Looking westerly from the Riding Arena on the eastern boundary.



Looking northerly towards the Stables.

Photographs of the Site



Bund immediately south of the arena.



Machine excavation into the bund.

Photographs of the Site



Looking northwesterly from on top of the Bund.



Stable Block looking Northerly. Backfilled HP3 in the foreground.

Photographs of the Site



Looking southwesterly from the Stable Block.



HP1 Location immediately west of the main Stable building.

Photographs of the Site



HP2 location, North of the Stable Block.



HP3 location, looking southerly.

APPENDIX H

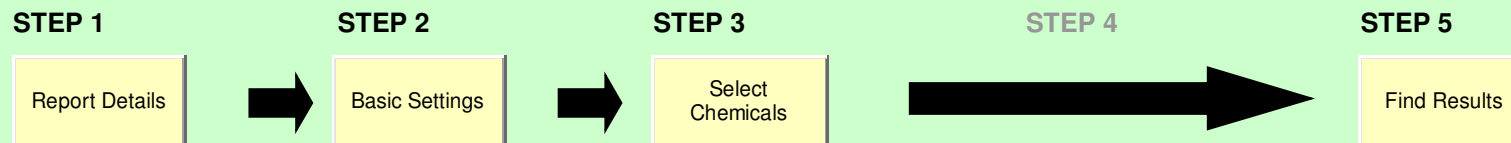
CLEA 1.07 Worksheets

Interactive CLEA software guide

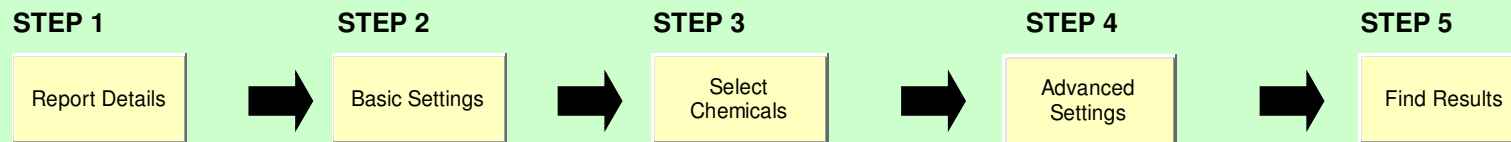
CLEA Software Version 1.071 © Environment Agency 2015

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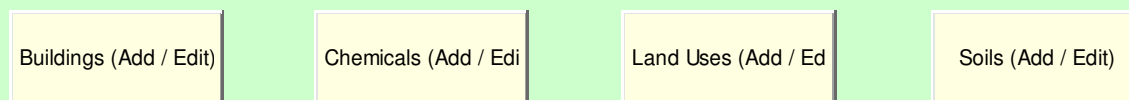
Generic assessment criteria (basic)



Site-specific assessment criteria (advanced)



Database management



*This workbook is supplied without any password protection and may have been modified from the original download by third parties.

STEP 1: REPORT DETAILS

Clear All Details

Back to Guide

User

J Twaddle

Company

The Brownfield Consultancy

Contact number

Report title

Adderbury

Job Number

BC592

Notes

STEP 2: BASIC SETTINGS

Apply Settings to Model

Back to Guide

SELECT LAND USE Residential with produce

RATIO MODE

LAND USE OPTIONS

RECEPTOR Female (res)

BUILDING Medium/large terraced house

SOIL TYPE Sandy loam

START AC 1

END AC 6

pH 7

SOM (%) 6

EXPOSURE PATHWAYS

ORAL ROUTES

- direct soil and dust ingestion
- consumption of homegrown produce
- soil attached to homegrown produce

DERMAL ROUTES

- indoor
- outdoor

INHALATION ROUTES

- indoor dust
- outdoor dust
- indoor vapour
- outdoor vapour

STEP 5: RESULTS

Find AC

Print Reports

Back to Guide

Number	Chemical	Ratio of ADE to relevant Health Criteria Value			Soil Assessment Criteria		
		oral HCV (dimensionless)	inhal HCV (dimensionless)	Combined (dimensionless)	oral HCV mg kg ⁻¹	inhal HCV mg kg ⁻¹	Combined mg kg ⁻¹
1	Arsenic	1.00	0.00	NR	1.59E+02	NR	NR
2							
3							
4							
5							
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APPENDIX I

Limitations

NOTES ON LIMITATIONS

This report has been prepared by the Brownfield Consultancy with all reasonable skill, care and diligence. This report is confidential and has been prepared solely for the benefit of the client as stated at the front of the report in relation to a specific development or scheme; and those parties with whom a warranty agreement has been executed, or with whom an assignment has been agreed.

Should any third party wish to use or rely upon the contents of the report, written approval must be sought from The Brownfield Consultancy; a charge may be levied against such approval. We accept no responsibility or liability for the consequences of this document being used for any purpose or project other than for which it was commissioned, and: this document to any third party with whom an agreement has not been executed.

Any comments given are based on the understanding that the proposed development will be as detailed. The Brownfield Consultancy warrants the accuracy of this report up to and including the published date. Additional information, improved practice or changes in legislation may necessitate this report having to be reviewed in whole or in part after that date.

This report is only valid when used in its entirety. Any information or advice included in the report should not be relied upon until considered in the context of the whole report. Whilst this report and the opinion made herein are correct to the best of our belief we cannot guarantee the accuracy or completeness of any information provided by third parties.

The opinions and recommendations expressed in this report are based on statute, guidance, and appropriate practice current at the date of its preparation. The Brownfield Consultancy does not accept any liability whatsoever for the consequences of any future legislative changes or the release of subsequent guidance documentation, etc. Such changes may render some of the opinions and advice in this report inappropriate or incorrect and we will be pleased to advise if any report requires revision due to changing circumstances. Following delivery of a report we have no obligation to advise the Client or any other party of such changes or their repercussions.

Phase 1 Reports

The work undertaken to provide the basis of a Phase I report comprised a study of available documented information from a variety of sources, together with (where appropriate) a brief walk over inspection of the site. The opinions given in this report have been dictated by the finite data on which they are based and are relevant only to the purpose for which the report was commissioned. The information reviewed should not be considered exhaustive and has been accepted in good faith as providing true and representative data pertaining to site conditions. It should be noted that any risks identified in this report are perceived risks based on the information reviewed; actual risks can only be assessed following a physical investigation of the site.

Historical maps and aerial photographs provide a “snap shot” in time about conditions or activities at the site and cannot be relied upon as indicators of any events or activities that may have taken place at other times. Any borehole data from the British Geological Survey sources are included on the following basis: “The British Geological Survey accept no responsibility for omissions or misinterpretation of the data from their Data Bank as this may be old or obtained from non-BGS sources and may not represent current interpretation”.

Phase II Intrusive Investigations

The investigation of the site has been carried out to provide sufficient information concerning the type and degree of contamination, and ground and groundwater conditions to allow a reasonable risk assessment to be made. The conclusions and recommendations made in this site appraisal report and the opinions expressed are based on the information reviewed and/or the ground conditions encountered in exploratory holes and the results of any field or laboratory testing undertaken. There may be ground conditions at the site that have not been disclosed by the information reviewed or by the investigative work undertaken. Such undisclosed conditions cannot be taken into account in any analysis and reporting.

Some of the conclusions in this site appraisal report may be based on third party data. No guarantee can be given for the accuracy or completeness of any of the third party data used.

The evaluation and conclusions do not preclude the existence of contamination, which could not reasonably have been revealed by the current work. Given the discrete nature of sampling, no investigation technique is capable of identifying all conditions present in all areas. The number of sampling points and the methods of sampling and testing do not preclude the existence of localised "hotspots" of contamination or different ground conditions where concentrations may be significantly higher than those actually encountered. Hence this report should be used for information purposes only and should not be construed as a comprehensive characterisation of all site conditions.

It should be noted that groundwater levels, groundwater chemistry, surface water levels, surface water chemistry, soil gas concentrations and soil gas flow rates can vary due to seasonal, climatic, tidal and man-made effects.

Exploratory hole locations provided in the report are generally established by tape measurement from existing features or boundaries. Hole locations are not accurately surveyed and ground levels at these locations are not obtained unless specifically requested.

The interpretation carried out in this report is based on scientific and engineering appraisal carried out by suitably experienced and qualified technical consultants based on the scope of our engagement. We have not taken into account the perceptions of, for example, banks, insurers, other funders, lay people, etc., unless the report has been prepared specifically for that purpose. Advice from other specialists may be required such as the legal, planning and architecture professions, whether specifically recommended in our report or not.

The objectives of the investigation have been linked to establishing the risks associated with potential human targets, building materials, the environment (including adjacent land), and to surface and ground water. The amount of exploratory work and chemical testing undertaken has necessarily been restricted by the short timescale available, and the locations of exploratory holes have been restricted to areas unoccupied by the building(s) on the site and by buried services.

New information, improved practices and legislation may necessitate an alteration to the report in whole, or in part, after its submission. Therefore with any change in circumstances or after the expiry of one year from the date of the report, the report should be referred to the Brownfield Consultancy Limited for re-assessment and, if necessary, re-appraisal.