

Phase 2 Site Investigation

Atterbury Gardens - Reading



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Non-Technical Summary

What is Proposed?	It is understood that proposals involve the construction of four residential dwellings with private gardens, associated access road and an area of open soft landscaped verge.
What is the Problem?	The following potential sources of contamination have been identified: ▶ Contamination Issue 1 – Lead and asbestos contamination to areas to the southeast and north of the site associated with WS02 and WS04, respectively.
What is the Result?	As a result of the identified ground contamination issue: ▶ A moderate/ low risk has been identified to future site users in areas of proposed soft landscaping to the southeast and north of the site.
What are the Next Steps?	This report should be submitted to the local planning authority to support the associated planning application. To mitigate the above identified risks, the following elements will need to be carried out: ▶ Preparation of a Remediation Strategy

Report Record

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Report Revisions

Revision Ref	Date	Author	Details
A	14/08/25	Toby Hill	Updated proposed plans provided and amendments made to reflect this

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1.0 Introduction

- 1.1 This report presents the findings of a Phase 2 Site Investigation (Environmental) – an intrusive contamination assessment that has been prepared in line with best practice guidance and planning policy.

What is a Phase 2 Site Investigation?

- 1.2 Phase 2 Site Investigation is the second stage of a phased contaminated land assessment that is often required to discharge planning conditions or remove objections once planning permission has been granted. A Phase 2 is usually required following a Phase 1 Desk Study, where potential sources of contamination have been identified, and the risks from which require further understanding.
- 1.3 The purpose of a Phase 2 Site Investigation is to physically inspect the condition of the soil, groundwater etc that may have been impacted by the sources of contamination identified in the Phase 1 Desk Study. The Phase 2 Site Investigation is site specific with the methods of investigation chosen being dependent on a number of factors, such as access, operational constraints, geology, potential contaminant sources and the receptors to be targeted.
- 1.4 Recommendations may include the preparation of a Remediation Strategy to detail how any identified risks can be mitigated/remediated, or possibly further investigation. If no unacceptable risks are identified, then typically no further environmental assessment is required other than a Watching Brief during the construction phase. Find out more about Phase 2 Site Investigations [here](#).

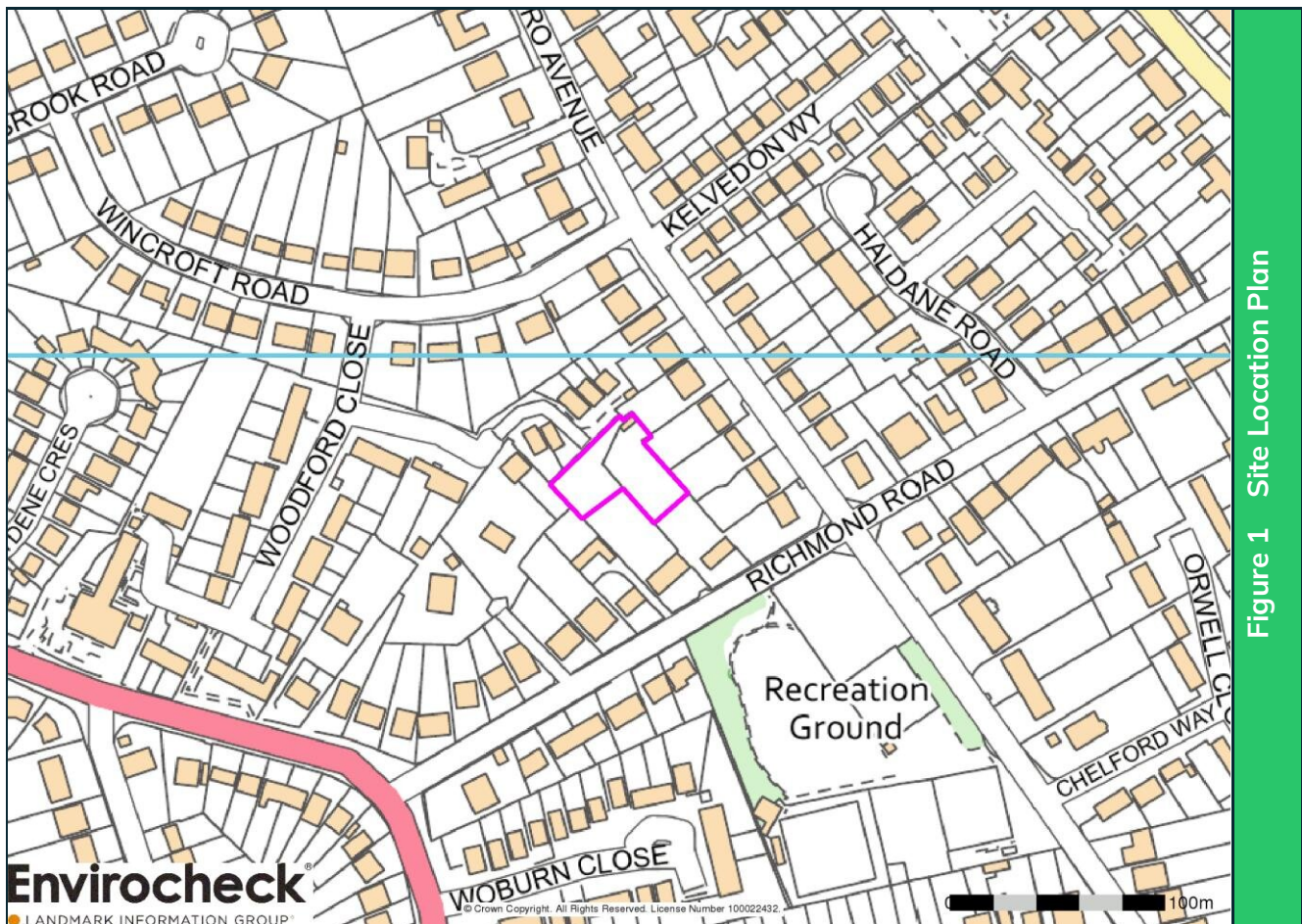
The Subject Site

Table 1 Site Details

Address	Land at Atterbury Gardens, in Reading, Berkshire, RG7 5SE
Eastings, Northings	470360, 175940
Area	0.17ha

- 1.5 The site, L-shaped in plan, currently comprises a vacant soft landscaped field to the rear of surrounding residential properties. The site was accessed via Atterbury Gardens from the

northwest and is located approximately 3km to the north of Reading Town Centre within a residential area. The site area is shown in Figure 1.



The Proposed Development

- 1.6 It is understood that the site is proposed to be redeveloped to provide a residential scheme, as illustrated in Figure 2.
- 1.7 The proposed development involves the construction of 4 detached houses with associated hard standing access, parking and private gardens. There are no basements, undercroft car parking or other underground structures anticipated with below ground features limited to foundations and buried services.



Figure 2 Proposed Development Plan

The Stakes & Objectives

- 1.8 As noted above, this Phase 2 Site Investigation forms the second stage of an iterative contaminated land assessment, to further investigate the potential sources of contamination and unacceptable risks identified during a Phase 1 Desk Study¹. Key findings and stakes relating to this investigation are summarised below.

Current and Former Site Uses: The site was undeveloped and formed part of a large agricultural field until the early-1910s. A gravel pit originally located off-site had extended onto the site by around 1913. The relatively shallow opencast works were described as a Gravel pit (central and north of the site) and a Chalk pit (southern periphery extending to the south-east and south-western areas of the site between the late-1930s and late-1950s). The southern section of the site

¹ Phase 1 Desk Study 3170 - 190503 - JM



was redeveloped and formed the rear garden of residential property No. 23 Richmond Road by the late-1950s.

Geology, Hydrogeology and Hydrology: BGS information showed the site to be underlain by bedrock geology comprising the Seaford Chalk Formation / Newhaven Chalk Formation (Undifferentiated) with overlying superficial deposits of the Boyn Hill Gravel Deposit. BGS Recorded Mineral Sites were noted on site and 10m south (which was noted to have extended onto the site). Given the mineral extraction understood to have taken place on site, and subsequent infilling, significant depths of Made Ground was anticipated.

A natural cavity was recorded 50m south of the site and related to three sinkholes and six solution pipes within the Chalk Group. The Boyn Hill Gravel Member is a Secondary A Aquifer and the Seaford / Newhaven Chalk Formation (Undifferentiated) is a Principal Aquifer. No surface water features were identified within 500m.

Potential Sources of Contamination: Deep Made Ground anticipated on site given the infilling of former quarry pits and the associated ground gases that may have been produced.

Initial Risk Ratings: A moderate risk was identified to future site occupants, site visitors, adjacent land users, perched groundwater, and shallow groundwater within the Superficial Aquifer from the anticipated Made Ground associated with the infilling of former opencast mining carried out on site.

A moderate risk was also identified to buildings and site occupants from ground gases generated by the quarry infill.

A low to moderate risk was identified with regards to ground and construction workers, bedrock geology, flora and buried services / structures from Made Ground and quarry infill.

- 1.9 It should be noted that the desk study was produced for a different proposed development layout to this Phase II site investigation report. However, the differences in layout are



marginal and as such not considered prohibitive to the assessment of risk associated with contamination on site.

- 1.10 Full reference should be made to the desk study to understand the preliminary conceptual model and basis of this investigation including the previous proposed site layout. The methodology adopted in this site investigation is based on the source-pathway-receptor model as set out in the Land contamination risk management guidance (LCRM, October 2020).
- 1.11 The main objective of this investigation is to reduce uncertainty and validate the findings of the Phase 1, associated with the preliminary conceptual site model and risk assessment. This investigation aims to determine the general presence or absence of contamination within the context of an Exploratory Investigation. It is noted that an Exploratory Investigation usually requires a lower density sample spacing than a Main Investigation, and that further works may be required in the future. Noting the likely acceptable levels of uncertainty, access restrictions, project constraints etc at this stage of the project, an Exploratory Investigation, as defined in BS 10175, has been adopted and is considered appropriate to assess the general suitability of the site for the proposed development.



Report Structure, Limitations & Changes

- 1.12 The investigation methodology is included in Chapter 2, with details on the ground conditions observed in Chapter 3. A summary of the generic risk assessments undertaken is presented in Chapter 4 and a wider discussion on the preliminary findings in the context of the CSM is provided in Chapter 5. Report conclusions and recommendations are set out in Chapter 6. Advisory items are detailed in Chapter 7.
- 1.13 This assessment has been undertaken in accordance with our Terms & Conditions. Full details on limitations and reliance are provided in those Terms. Third party information which has been reviewed and used to inform the assessments presented herein, including public records held by various regulatory authorities and environmental database data has been assumed to be true and accurate.
- 1.14 This assessment has been carried out to determine the potential risks posed to future end users, along with other key receptors, based on the current development. Should revisions



in the development proposals result in a change any assessment parameters detailed in this report, a re-assessment of the risk should be carried out.



2.0 Site Investigation Methodology

- 2.1 The intrusive site investigation works were undertaken on 18th January 2024 under the direct co-ordination of a suitably trained and qualified consultant employed by Lustre. The intrusive works were carried out with due regard to existing standards and good practice guidelines including *BS10175: 2011+ A2:2017*², *BS5930: 2015*³ and guidance produced by the AGS⁴.

Enabling Works

- 2.2 Prior to commencing with the intrusive works, each exploratory location was checked for any readily detectable shallow services using a Cable Avoidance Tool and Signal Generator.
- 2.3 Prior to advancing boreholes with the drilling equipment, hand dug starter pits were excavated to 1.2m bgl.

Site Investigation Rationale

- 2.4 Exploratory locations advanced in this investigation are summarised below comments on rationale, termination depth and monitoring installations.

Table 2 Exploratory Position Details

Hole ID	Base Depth (m bgl)	Objective	Monitoring Well
WS01	4	General Coverage	Yes
WS02	4	General Coverage	Yes
WS03	4	General Coverage	Yes
WS04	4	General Coverage	Yes

- 2.5 Exploratory holes were located to obtain the required information to meet the project objectives, whilst avoiding services, access and egress routes. Drawing 4904-001 shows the positions of all exploratory locations.



² British Standard – Code of Practice for Investigation of potentially contaminated sites. BS 10175: 2011 + A2:2017.

³ British Standard – Code of Practice for Site Investigation. BS 5930: 2015.

⁴ Association of Geotechnical & Geoenvironmental Specialists, AGS Guide to Environmental Sampling, 2010.



Windowless Sampler Boreholes

- 2.6 Four windowless sample boreholes were advanced on site to a depth of 4m bgl. The windowless sample boreholes advanced through the surface soils and into the underlying natural soils, using a conventional tracked WS drilling rig. Standard Penetration Tests (SPTs) and dynamic probing methods were carried out in all of the windowless sample boreholes with the corresponding uncorrected 'N' values included on the log, presented in Appendix B.

In-Situ Field Tests

- 2.7 Headspace testing was carried out to determine the volatile content of soils (vapours) using a photo-ionisation detector (PID) with 10.6eV lamp.



Monitoring Installations

- 2.8 As noted above, boreholes were installed to enable subsequent return monitoring. Details on the monitoring installations, including well response zones and the general purpose of the wells, are provided in the table below.
- 2.9 In summary, four monitoring wells were installed as part of the works, as summarised in the table below. The wells comprised plain 50mm pipe to a maximum depth of 1m bgl, with a slotted 50mm diameter pipe to a maximum depth of 4m bgl. The annulus surrounding the slotted pipe was filled with washed gravel, which was then plugged with a 0.5m bentonite seal surrounding the plain pipe. The monitoring wells were completed with a gas tap and a flush lockable cover and finished to match existing ground cover.

Table 3 Well Design Summary			
Hole ID	Response Zone	Gas Well	Groundwater Well
WS01	Cohesive Made Ground	Yes	Yes
WS02	Infill Material	Yes	Yes
WS03	Granular Made Ground	Yes	Yes
WS04	Chalk	Yes	Yes



Ground Gas Monitoring

- 2.10 Six rounds of ground gas monitoring were carried out as part of this investigation to gain an understanding of the ground gas regime at the site. A summary of the gas monitoring results is provided in the Environmental Assessment Appendix. The monitoring was undertaken over a range of atmospheric pressures between 966mb and 1010mb with half of the visits conducted during periods of low and/or falling atmospheric pressure.

Chemical Analysis (Environmental)

- 2.11 A total of seven soil samples were scheduled for chemical testing. Samples were analysed for a range of determinands, which considers the potential contaminants associated with the current/historical site uses, as follows:
- ▶ Metals and inorganics: arsenic, cadmium, chromium, copper, lead, mercury, nickel, selenium, zinc;
 - ▶ pH;
 - ▶ Total phenols (monohydric);
 - ▶ Speciated Polycyclic Aromatic Hydrocarbons (PAHs, total and speciated EPA 16);
 - ▶ Speciated Total Petroleum Hydrocarbons (TPH CWG);
 - ▶ BTEX;
 - ▶ Asbestos screen;
- 2.12 Generally, where PID results indicated the potential of presence volatile contaminants or visual / olfactory evidence of contamination was noted, appropriate testing was scheduled in preference of those samples.
- 2.13 Waste Acceptance Criteria (WAC) testing was undertaken on three samples from each of the Made Ground layers.



3.0 Ground Conditions

- 3.1 This chapter collates all the factual information from the site investigation, including field observations and in-situ testing, to present a summary of the ground conditions encountered during the intrusive works. Exploratory holes logs are presented in Appendix B.
- 3.2 A brief interpretation of any visual /olfactory contamination is provided at the end of the chapter, in the context of the potential sources of contamination. Field observations on the physical composition of the shallow soils is also considered in determining the suitability of the soils for retention in the proposed development (presence of sharps or deleterious materials).

Table 4 Summary Ground Model					
Strata	Min Depth (m bgl)	Max recorded Depth (m bgl)	Min Thickness (m)	Max Thickness (m)	Exploratory Holes
Made Ground	0	>4	1.9	>4	WS01, WS02, WS03, WS04
Seaford Chalk / Newhaven Chalk Formation (Undifferentiated)	1.9	>4	2.1	2.1	WS04

Spatial Distribution and Extent

- 3.3 Made Ground was recorded in all exploratory holes from surface and was encountered to a maximum depth of 4m bgl. Depth and thickness of the Made Ground was proven in only one position, WS04 at 1.90m bgl, where Chalk was encountered to a maximum recorded depth of 4m bgl.
- 3.4 The depth of Made Ground was subsequently determined by dynamic probing and comparing the changes in ground density as the probes advanced from the Made Ground into the more dense and undisturbed chalk. This indicated that Made Ground extends to a maximum depth of 10m bgl (WS03), suggesting a range of thickness from 1.9m (WS04) to 10m (WS03).
- 3.5 It should be noted that within WS02 from 2.6m to 4m bgl there was no soil recovery and as such the full thickness of the Fill Material was not proven at this exploratory location.



Anthropogenic Components & Evidence of Contamination

- 3.6 In terms of composition, man-made components within the Made Ground were absent from the majority of lenses with gravel comprising flint only. However, within WS02 between 0.90m bgl and 2.6m bgl man-made components within the gravel were noted including brick, concrete, wood, tile and glass. The composition of gravel and therefore the Made Ground at large within WS02 is considered to be characteristic of typical infill 'soil and stones' material used in the backfilling of former quarry pits. The remaining Made Ground comprising flint gravel is still regarded as infilled material, but it is anticipated that these soils could be re-worked natural soils comprising either arisings from the original quarry or imported to the site.
- 3.7 PID readings were taken on all samples however no VOCs were identified above the limit of detection. Based on the soil arisings logged during the investigation, fragments of asbestos containing material (ACM) were not recorded. Initial evidence of contamination was limited to the black colouring to soils within WS02 and the anthropogenic inclusions identified. The black colouring is indicative of ashy or high organic containing soils.
- 3.8 No visual or olfactory evidence of contamination was noted within the Seaford and New Haven Chalk.

Made Ground



Cohesive (Top) & Granular (Bottom) Made Ground within WS01



Fill Material Identified 0-2.6m bgl within WS02

3.9 Made Ground was recorded in all exploratory holes from surface (minimum depth encountered) and encountered to a maximum recorded hole depth of 4m bgl. The depth of the Made Ground was proved in WS04 only at 1.90m bgl and present as three layers, summarised below:

- ▶ **Cohesive Made Ground:** Sandy gravelly CLAY was identified in all exploratory holes from surface and encountered to a maximum base depth of 4m bgl. The thickness of the sandy gravelly clay encountered ranged from 0.9m to 3.1m, with seven discrete lenses.
- ▶ **Fill Material:** Sandy gravelly CLAY identified within WS02 between 0.9m bgl and proven until 2.6m bgl. This material was similar to the Cohesive Made Ground found above it and elsewhere but contained a number of anthropogenic inclusions such as brick, concrete, wood, glass and tile. This material type was not identified elsewhere on site.
- ▶ **Granular Made Ground:** Clayey sandy GRAVEL was identified in two exploratory holes (WS01, WS03) beneath the cohesive Made Ground with a top depth of 1.3m bgl and encountered to a maximum base depth of 4m bgl. The thickness of the clayey sandy gravel encountered ranged from 0.5m and 1m, with two discrete lenses noted.

3.10 These layers were encountered as listed above with the Granular Made Ground identifiable beneath or in between layers of the Cohesive Made Ground. Regarding WS02, the Cohesive Made Ground was identifiable above the Fill Material.

Seaford and New Haven Chalk Formation (Undifferentiated)



Chalk identified 2-3m bgl within WS04



A view of WS04 towards the Southwest



- 3.11 Seaford and New Haven Chalk Formation was recorded in a single exploratory hole (WS04) with a top depth of 1.9m bgl and encountered to a maximum base depth of 4m bgl. The recorded thickness of the Chalk was therefore 2.1m.
- 3.12 The Chalk was recovered as structureless comprising a white gravelly SILT.

Groundwater Summary – Return Monitoring

- 3.13 During the return monitoring, groundwater was not recorded during any of the visits.

Summary of Land Quality Field Observations

Table 5 Field Observations	
	Consideration Needed?
Evidence of Contamination	
Visual evidence of contamination has been identified during the site investigation in the form of black ashy soils noted from 0.9m within WS02. This soil horizon also contained anthropogenic inclusions such as wood, tile, glass, concrete and brick which are indicative of fill used to infill the former quarry pit.	
In-situ headspace testing and olfactory observations did not indicate the presence of any volatile-type contamination.	Yes
The selection of samples for chemical testing and determinants analysed for has been based on the above field observations in the context of the conceptual site model and proposed development layout. These results are discussed in Chapter 4.	
Gas Generation Potential	
Field observations during the investigation did not identify any significant amounts of potential gas-generating materials (such as, decayed organic matter, deleterious/putrescible wastes).	No
Physical Suitability	
No significant quantities of sharps, deleterious materials or wastes were not observed in the shallow soils, and as such would be considered physically suitable for retention within areas of proposed soft landscaping.	Yes
Drainage Potential (Shallow Soils)	
Given the expected low permeability of the clay-rich shallow soils, these soils may not sufficiently drain when converted to soft landscaping given the increase in surface water runoff from the proposed development. This may lead to waterlogging and risk mobilising potential contaminants present in the Made Ground.	Yes



4.0 Quantitative Risk Assessment

4.1 Factual information from the site investigation and subsequent analytical data has been subjected to several semi-quantitative risk assessments. The results of these assessments are presented in Appendix E and summarised in this Chapter. This stage of risk assessment considers all laboratory data against the respective risk criteria, regardless of factors such as location, depth and proposed layout/exposure pathways; Chapter 5 considers any identified risks in the context of the proposed site layout. The assessments undertaken include:

- ▶ Human health risk assessment (soils);
- ▶ Water pipeline suitability test;
- ▶ Phytotoxicity assessment;
- ▶ Soil Aggressivity (buried concrete);
- ▶ Groundwater quality risk assessment; and
- ▶ Preliminary ground gas assessment.

Human Health Risk Assessment (Soils)

- 4.2 The Environment Agency 'Model Procedures for the Management of Land Contamination, CLR 11' report provides a risk management methodology for identifying hazards and assessing risk associated with land affected by contamination. CLR 11 adopts a tiered approach to determining risk, with the first tier involving the evaluation of pollutant linkages using assessment criteria / screening levels for contamination – this is known as a Generic Quantitative Risk Assessment. We have adopted LQM/CIEH Suitable 4 Use Levels (S4ULs) where available. Lead has been assessed using the Category 4 Screening Level (C4SL).
- 4.3 S4ULs & C4SLs for a 'residential with homegrown produce' land use scenario have been adopted with a soil organic matter content parameter of 1% for both the Made Ground and natural soils, based on site-specific organic matter content data. The residential with homegrown produce land use scenario is consistent with the proposed development plans set out in Chapter 1. Chemical analysis data has been compared to these risk thresholds, as presented in the Environmental Assessment Appendix; this screening process forms the generic quantitative risk assessment (GQRA).





- 4.4 Samples generated from the natural Chalk soils identified within WS04 were not scheduled for any contamination testing given the scope of the investigation and the substantial depth this material was identified during the investigation. It is unlikely that at the depth the Chalk was identified that a pathway could exist between future site users and this material. However, these soils will likely be assessed during future phases of investigation as part of the enabling works for soil disposal to support the proposed development and as such potential hazards regarding other receptors could be addressed if identified.

Human Health GQRA – Made Ground

- 4.5 Samples recovered from the Made Ground underwent chemical analysis for a range of general determinands, including asbestos, inorganics and metals, PAH, TPH.
- 4.6 Asbestos was analysed for in seven samples and was detected in a single sample, WS02 at 2.5m bgl. Notably asbestos was not detected in the sample generated at 1m within WS02 which suggests that the asbestos is confined to soils at depth within the area of WS02.
- 4.7 However, it is noted that if asbestos is identified in a single or a few sporadic locations, there is a reasonable likelihood that the presence of asbestos is not limited to these locations. **In these instances, the absence of asbestos in soils should only be considered valid for those discrete locations where asbestos has been tested for, and not detected by the laboratory.** As such this investigation is not a definitive assessment on the presence or amount of asbestos within the ground across the entire site.
- 4.8 A range of determinands were found to be either below the limit of detection or below their respective screening criteria: most metals and inorganics, all 16 PAH compounds, all 14 TPH fractions, BTEX, phenols.
- 4.9 Concentrations of Lead were found to be pose a potential risk to future site users as recorded concentrations of this determinand were above their respective risk criteria. Concentrations of lead were recorded between 290mg/kg in WS04 at 0.2m bgl and 600mg/kg at WS02 at 2.5m bgl.
- 4.10 Elevated lead concentrations (acceptable threshold for private gardens: 200mg/kg) were recorded at WS02 at 1m bgl at (390mg/kg), WS02 at 2.5m bgl at (600mg/kg) and WS04 at 0.2m bgl at (290mg/kg).



- 4.11 In summary, soils at WS02, WS04 recorded concentrations of contaminants above the recommended thresholds considered protective of human health. As such, these soils may present an unacceptable risk to future site users.

Water Pipeline Suitability Test

- 4.12 The development is likely to require the installation of new potable water pipes. UK Water Industry Research (UKWIR) guidance⁵ sets chemical concentration thresholds that are used to specify a pipe design that is considered safe. Water pipes will likely be placed at a minimum depth of 750mm as normally required by UK water authorities and therefore this will be in the Made Ground.
- 4.13 Although water pipeline suitability thresholds were exceeded in a single location within the private garden areas (associated with soils at WS01), it is noted that the single exceedance was associated with a deeper sample at 1.4m bgl. The sample recorded a concentration of 11mg/kg for C11 to C20 which exceeds the UKRWIR guidance value of 10mg/kg for C11 to C20 for PE pipes. Considering the depth of potable water pipe placement of 0.7m bgl, this sample is not considered reflective of soils at the pipe placement depth. All other samples collected from the Made Ground recorded concentrations of C10 to C20 below the laboratory's limit of detection. As such, considering the development layout and the depth of the single exceedance, the risk to potable water pipes is considered to be **low**. It may be prudent to confirm this with the relevant water authority prior to purchase and installation of potable water pipes.

Phytotoxicity Assessment

- 4.14 The recorded concentrations of copper, nickel and zinc have been compared against the BS3882: 2015⁶ thresholds for phytotoxic contaminants in soils to determine if a potential risk to healthy plant growth exists.

⁵ UK Water Industry Research (UKWIR). Guidance for the Selection of Water Supply Pipes to be used in Brownfield Sites. Ref. 10/WM/03/21. 2010

⁶ British Standard BS 3882:2015 (Specification for topsoil and requirements for use)



4.15 As shown in the Environmental Assessment Appendix, from the Made Ground, a sample generated from WS02 at 2.5m recorded determinands above risk criteria considered protective of healthy plant growth:

- ▶ Copper was recorded above criteria (200mg/kg) at 470mg/kg.
- ▶ Zinc was recorded above criteria (300mg/kg) at 540mg/kg.

4.16 However, given the depth of the sample tested, it is unlikely that the soils at this depth will be utilised as a growing medium. If soils identified at 2.5m bgl from WS02 were indicative of shallow soils on site, it is anticipated that the typical dressing of the site with topsoil for landscaping purposes would mitigate any residual risk of phytotoxicity and facilitate a habitable growing medium.

Soil Aggressivity (Buried Concrete)

4.17 The analytical data for soil pH and water-soluble sulphate is summarised in the Environmental Assessment Appendix, along with the corresponding BRE classification⁷. The 'brownfield' scenario was applied to the results from the Made Ground and the 'natural' scenario to results from the natural ground.

From the Made Ground, seven samples were tested; no samples were analysed from natural soils. The characteristic values for the Made Ground for pH and water soluble sulphate were determined as 7.8 and 0.0901g/l respectively, giving a Design Sulphate (DS) classification of DS1 and an associated Aggressive Chemical Environment for Concrete (ACEC) classification of AC-1s.

Groundwater Quality Risk Assessment

4.18 Soil contamination has the potential to leach into underlying shallow groundwater. On-site groundwater quality can also be adversely impacted by off-site groundwater contamination migrating down hydraulic gradient onto site.

⁷BRE Guidance Special Digest 1. Concrete in Aggressive Ground. 3rd Edition, 2005.



- 4.19 Groundwater was not recorded in the site investigation or on subsequent monitoring visits and is therefore not considered a viable receptor.



Preliminary Ground Gas Assessment

- 4.20 Six rounds of ground gas monitoring were carried out as part of this investigation to gain an understanding of the ground gas regime at the site. A summary of the gas monitoring results is provided in the Environmental Assessment Appendix. The monitoring was undertaken over a range of atmospheric pressures between 966mb and 1010mb with half of the visits conducted during periods of low and/or falling atmospheric pressure.
- 4.21 Carbon dioxide was detected at a maximum concentration of 4.2% v/v (WS02). Methane was not detected during any of the monitoring visits. As the guidance requires special consideration of any concentration of carbon dioxide above 5% v/v and methane above 1% v/v, none of the wells were noted to exceed the 5% and 1% thresholds and as such meet the criteria for Characteristic Situation 1 (CS1).
- 4.22 Concentrations of Oxygen were recorded depleted down to 14.6% (WS02). Maximum in-situ headspace (PID) readings peaked at 0.9ppm (WS02). Positive flow was not recorded in any wells on any of the monitoring visits.
- 4.23 Gas Screening Values (GSVs) for carbon dioxide and methane were calculated using the maximum recorded values (as discussed above), and the peak flow reading. In accordance with BS8485 2018 + A1 2019, where positive flow/positive concentrations of ground gases are not recorded, the limit of detection should be used in the GSV calculations (i.e. 0.1% v/v or 0.1l/hr respectively). The GSV for carbon dioxide was calculated as 0.0042l/hr and the GSV for methane was calculated as 0l/hr. Based on the calculated GSVs, the site has been classified as CS1.



Summary of Quantitative Risk Assessments

Table 6 Assessment Summary	
	Possible Issue Identified?
Human Health Risk Assessment (soils)	Yes
Water Pipeline Suitability Test	No
Phytotoxicity Assessment	Yes
Soil Aggressivity (buried concrete)	No
Groundwater Quality Assessment	No
Preliminary Ground Gas Assessment	No



5.0 Phase 2 Conceptual Model & Risk Assessment

Introduction

- 5.1 A preliminary conceptual site model was included within the previous Desk Study report¹, which identified potential sources of contamination attributable to the historical and current site uses. This Phase 2 Site Investigation was subsequently designed to further assess the identified potential sources of contamination whilst also gathering information on the environmental setting and receptors (e.g. ground conditions, groundwater etc).
- 5.2 This chapter considers the results from the quantitative risk assessments in the context of the wider conceptual site model, particularly the proposed development layout, field observations and ground conditions recorded during the investigation, and any other relevant information such as groundwater flow etc, anticipated enabling work etc. Considering the quantitative risk assessment results alongside these factors provides an updated qualitative risk rating and represents a secondary more site-specific tier of assessment.
- 5.3 Where potential issues have been identified following the quantitative risk assessment in Chapter 4, these have been considered in this next phase of assessment, supplemented with the field observations set out in Chapter 3. Quantitative assessments which did not identify any issues have not been considered further.

Acceptably Low Risks – Final Development Context

- 5.4 The Phase I Desk Study produced for this site identified a moderate risk to buildings and site occupants from ground gases generated by on-site Made Ground and the quarry infill. However, the ground gas monitoring conducted as part of this assessment has generated data which suggests the site can be classified as CS1. Therefore, ground gases are no longer considered to present an unacceptable risk to the proposed development.



Identified Risks of Concern – Final Development Context

- 5.5 Any issue(s) identified following the second phase of assessment have been grouped into relevant Contamination Issues. A Contamination Issue can either have a common source, contaminant or receptor, and either one or more risk ratings as a result. The following table(s) summarise the identified contamination issues.

CONTAMINATION ISSUE 1		
Area of Site		
Areas to the southeast and north of the site associated with WS02 and WS04, respectively.		
Contaminants of Concern		Receptor Category at Risk
Lead and Asbestos		Human Health
Source Details (occurrence and distribution)		
Concentrations of Lead were recorded above the accepted guidance value within soils at WS02 (at 0.2m bgl & 2.5m bgl) and WS04 (at 0.2m bgl) to the southeast and north of the site, respectively. These concentrations relate to the Made Ground identified at these depths within these locations associated with the infilling of former quarry pits on site.		
Asbestos was also detected at 2.5m bgl within WS02 and likely also relates to the fill material identified on site. It is noted that given the nature of how asbestos contamination of soils occur, asbestos contamination may not be limited to the locations and depths identified. However, given the absence of asbestos within the sample at 1.0m bgl within WS02 the asbestos is considered to be contained between at least 1.0m bgl and a minimum of 2.5m bgl.		
Context of Proposed Development and Layout		
The majority of the site will be laid to hardstanding with an access road and buildings. Soft landscaping is proposed as private gardens and open soft verges. Where soft landscaping is present, pathways will be active, and the resultant risk will require mitigation. Elsewhere, hardstanding will prevent direct contact with the soils and contamination (including asbestos).		
WS02 and WS04 are both located within proposed areas of soft landscaping with WS02 located on the boundary of the private gardens of two of the four proposed residential dwellings. WS04 is associated with an area of proposed open soft landscaped verge.		
Risk Summary		
Acknowledging the proposed building and hardstanding configuration as well as the lack of exceedances at the other exploratory hole locations, resultant risks to end users are only present in these specific areas of proposed soft landscaping.		
Given the location of these exceedances, the Lead and Asbestos identified within WS02 are considered to pose a risk primarily to future site users. The exceedance of Lead identified within WS04 is considered to also pose a risk to future site users but to a lesser extent given this area of soft landscaping is unlikely to be utilized as amenity space and exist more for decoration of the development.		
Receptor	Risk Rating	Notes



Future Residential Site Users

Moderate/ low

Risk only in areas of proposed
soft landscaping

Risks to construction workers from the presence of asbestos and lead in soils will need to be considered in a construction method statement.

Impact to Development

Risk ratings could be readily mitigated as part of the development though the implementation of basic remediation which focuses on source removal / breaking the exposure pathway (see Chapter 6). Alternatively, risks could be mitigated through a change in the site layout through the removal of soft landscaped areas.



6.0 Conclusions & Next Steps

- 6.1 A Phase 2 Site Investigation has been undertaken to support the proposed redevelopment of a site located off Atterbury Gardens in Reading, Berkshire. The objective of the works was to provide information on the contaminative status of the site whilst obtaining information on the shallow ground conditions.

Ground Condition Summary

- 6.2 The site investigation identified that the ground conditions at the site comprised Made Ground, encountered in all exploratory holes, overlying Chalk, encountered in WS04 only at 1.90m bgl. Only the Made Ground within WS02 between 0.90m and 2.6m bgl contained anthropogenic inclusions of gravel brick, concrete, wood, tile, and glass.
- 6.3 No significant evidence of putrescible materials was identified by the investigation such as household waste or significant quantities of organic material.
- 3.14 Evidence of contamination was identified initially from the black colouring to soils within WS02 and later through the chemical testing. Chemical evidence included the identification of asbestos and lead within the Made Ground.

Contamination Risk

- 6.4 This investigation has shown that the contaminative status of the site should not be prohibitive to the proposed redevelopment of the site.
- 6.5 As illustrated in Chapter 4, some of the contamination risks attributable to viable pollutant linkages were considered to be low and very low. However, elevated risks (moderate/low) have been found, and these will need remedial action to reduce the risks to identified receptors. In summary, the following risks require either further assessment or management to ensure that the site is safe and compliant. All risks can be effectively mitigated using routine remedial measures.
- ▶ **CONTAMINATION ISSUE 1** - Elevated concentrations of Lead and Asbestos recorded above the assessment criteria for residential with homegrown produce end use in the back gardens of the easterly properties (WS02) and the proposed



soft landscaping to the north (WS04). **Moderate/ low** risk to future site users in areas of proposed soft landscaping. **POTENTIAL REMEDIAL MEASURE - Clean Cover System (CCS):** A clean cover system (CCS) would mitigate the risks from shallow soil contamination to end users in areas of proposed soft landscaping; a CCS is not required below proposed building footprints or roads etc. Where required, the CCS will not only provide clean, safe soils for flora but also prevent exposure to any residual contamination at depth to end users.

Planning Considerations & Next Steps

- 6.6 It is understood that this report will be submitted to the local planning authority to support the application. On award of planning permission, it is expected that the requirement for a Remediation Strategy and subsequent verification will be conditioned by the Environmental Health Officer.
- 6.7 The next phase in the contaminated land process is the preparation of a Remediation Strategy which will require approval by the council before remedial works commence. The Remediation Strategy would formulate in detail the proposed remedial works based on final formation levels, building construction method, site layout etc. In addition, the strategy would confirm the necessary testing and validation requirements for validating the satisfactory completion of these works. During the remedial works, verification would be needed to demonstrate that the remedial works have been completed and typically involves site inspections and testing. Records of any off-site disposal of excavated soils, with the conveyance and waste transfer notes would also be collected.



Non-specialist Environmental Watching Brief

- 6.8 It is prudent to ensure a watching brief is carried out by a suitable person on-site throughout the works who is experienced and capable of identifying signs of potential contamination, including, but not limited to, staining, unfamiliar odours and visual evidence of potentially contaminated/ hazardous materials such as asbestos.
- 6.9 If any suspected ground contamination such as unusual odours, visually impacted soils/water, suspected asbestos or any potentially hazardous waste not recorded during this investigation is encountered during the works, further sampling and testing should be



carried out under supervision by Lustre. This will allow the determination of the appropriate management and mitigation measures to address any potential risks as part of the development of the site.

Unforeseen Ground Contamination

- 6.10 A reasonable amount of skill and care, as expected, has been used to deliver this investigation in accordance with the agreed scope of work and meet the required objectives. However, the potential for unforeseen contamination to be present, or encountered during future groundworks, maintenance works and/or site clearance/redevelopment works cannot be entirely eliminated. This will be particularly important when working within the vicinity of areas that were not investigated, or the method of investigation employed was limited due to safety (i.e. live underground services), access, financial, public relations, third party intervention and/or risk etc. which influenced the scope of the investigation. A site investigation can only provide a snapshot of the ground conditions encountered at the time covering a relatively small proportion of the site, with samples only representing discrete parcels of ground. Care and diligence are advised even if a site investigation records a low or very low risk of contamination. Lustre cannot be held responsible for unforeseen contamination that may be present or encountered in the future.

Statutory Designation

- 6.11 It is our opinion, based on the findings of this Phase 2 Site Investigation, that the site would not be designated as statutory contaminated land by the Local Authority in accordance with the published Statutory Guidance. It is advisable however that any recommendations to reduce the risk ratings noted in the previous chapter are implemented fully, to ensure the site becomes safe and compliant.



7.0 Construction Phase Advisory Matters

- 7.1 Aside from land contamination issues that require consideration under the planning regime, the findings of this investigation impact other aspects of the construction phase. These items often require action to ensure that you continue to have a safe and compliant site and include matters such as waste soil classification, managing contamination during construction, drainage conditions, impacts of piling etc.

Waste Classification of Soils

- 7.2 The development will require soils to be removed from site as part of the groundworks and construction process. Guidance set out in the Waste Framework Directive and the Environment Agency's Technical Guidance WM3 Hazardous Waste, provides information and controls on how sites should manage and dispose of waste soils. Waste producers have a duty of care under the waste regulations which initially requires them to classify the waste they produce before it is collected, disposed of or recovered, to identify any controls that apply to the waste movement, to complete relevant documents and records, to identify suitably authorised waste management options and to prevent harm to people and the environment.
- 7.3 This section provides information on the preliminary waste classification of soils, which may require removal from site. It is important to note that the regulations require waste producers to classify any waste soils; however, the soils assessed as part of this investigation may not be representative of the soils being removed from site during redevelopment and therefore consideration should be given by the waste producer if further testing of waste soils is needed prior to disposal, to ensure the actual waste soils leaving the site is classified appropriately.

USEFUL INFORMATION ON WASTE, CODES AND DISPOSAL

When do Soils Become a Waste?	Any man-made soils (such as Made Ground) or contaminated soils become a waste when excavated from the ground and must be disposed of off-site, unless suitable permits are granted to allow re-use. Uncontaminated natural soils which are excavated and have a certainty for re-use on site as part of redevelopment works are not considered a waste.
What are Mixed Soil Wastes?	Mixed wastes are soils which contain materials that could be classified differently. Mixed waste should be assessed separately and undergo a form of pre-treatment and/or segregation prior to disposal. Mixed wastes could



USEFUL INFORMATION ON WASTE, CODES AND DISPOSAL

	include soils contaminated with ACM – in this case both the ACM fragments and soils would require separate assessment and disposal. Mixing of hazardous wastes and soils with different hazardous substances (hydrocarbons, asbestos etc) is prohibited under the Waste Framework Directive.
Do I Need to Segregate My Wastes?	Measures should be implemented on site to segregate waste streams with natural material stockpiled separately from any Made Ground. Any oversized and waste materials (such as construction waste, ACMs, plastics, metals etc), will require segregation from the soil (where practicable), and separate and appropriate disposal.
What are the Available Waste Classifications?	Waste soils must fall into one of two categories: Hazardous or Non-Hazardous. Each classification results in the following European Waste Codes (EWC codes): Hazardous soils: 17-05-03 (soil and stones containing hazardous substances) Non-Hazardous soils: 17-05-04 (soil and stones) The term 'inert' is not strictly a classification of waste. These codes relate to Chapter 17 in the List of Waste, as construction and demolition wastes (including excavated soil from contaminated sites). The case for hazardous waste is unrelated to soils that may have been identified as "hazardous" from a human health risk assessment.
What Makes a Waste Hazardous?	Concentrations of contaminants which exceed established hazardous properties (HP) and/or statements. This can include the presence of asbestos >0.1%, high concentrations of certain metals, significant hydrocarbon contamination etc. The Hazardous properties thresholds for waste classification are different to screening values for assessing risks to human health. A waste soil could be classified as hazardous based on the accumulative effect of contaminant concentrations, but not pose a risk to human health based individual contaminant concentrations.
What are the Landfill Options?	Waste soils can be disposed of at hazardous landfills, non-hazardous landfills and inert landfills. Some sites, which are not landfills such as recovery and restoration sites, often have similar but more stringent criteria for receiving inert soils. It is the responsibility of the waste producer to ensure that the chosen waste recovery or disposal site is able to accept the waste soils and that the EWC codes for waste soils from construction and demolition are included on the receiving sites Environmental Permit.
Soils Suitable for Disposal at an Inert Landfill	'Inert' is not a waste classification, but a category of waste recipient which can only accept waste that acts in an inert way when deposited. Soils suitable for disposal at an inert landfill must not undergo any significant physical, chemical or biological transformations (dissolve, burn, physically or chemically react, biodegrade etc) in a way likely to cause environmental pollution or harm to human health. Practically it must be non-hazardous, not contain organic materials, plastics, metals, contamination etc, and meet the criteria for 'inert' disposal through Waste Acceptance Criteria (WAC) testing. Given the variability of Made Ground and potential for this soil type to contain a significant amount of non-inert materials which cannot be readily segregated, Made Ground won't often be considered suitable for disposal at an inert landfill. However, if the soils contain an incidental amount of non-inert materials (following segregation), are relatively homogenous, non-



USEFUL INFORMATION ON WASTE, CODES AND DISPOSAL

	hazardous and meet the inert WAC criteria then this material can be disposed of at an inert landfill. However, it is noted that certain wastes may be disposed of as inert without testing. Council Decision 20003/33/EC Annex, 2.1.1 lists those wastes that meet the definition of inert waste in Article 2(e) of the Landfill Directive. In the case of suspicion of contamination testing should be applied.
When do I Need a WAC Test?	WAC testing is only needed when soils are found to be hazardous or could be disposed of at an inert landfill. WAC testing is not required if the soils are non-hazardous and plan to be disposed of as a non-hazardous landfill. A WAC test does not classify the waste!

Preliminary Waste Assessment of Soils

- 7.4 Detailed information on the process adopted in this preliminary waste assessment is set out in Appendix A. The table below summaries the findings of the preliminary waste assessment based on the results of the chemical testing discussed earlier in this report.

Table 7 Preliminary Waste Assessment of Soils

Soil Type	Area / Type	Waste Classification	Waste Code	Disposal Route / WAC Result	Comments
Cohesive Made Ground	Site Wide / Cohesive	Non-hazardous	17 05 04	Potentially Inert	Could be considered for disposal to an inert receiving facility still as Non-Hazardous waste with the corresponding Waste Code.
Granular Made Ground	Site Wide / Granular	Non-hazardous	17 05 04	Potentially Inert	
Fill Material	WS02 / Southeast corner	Non-hazardous	17 05 04	Potentially Inert	

- 7.5 Copies of all HazWasteOnline results are provided in Appendix E. WAC test certificates are provided in Appendix C.

Asbestos in Soils and Waste Classification

- 7.6 If asbestos contaminated soils are present on site, specific measures need to be put in place to safely manage these arisings. Any visible ACM fragments (>50mm) in soils will result in that material being classified as hazardous waste. If the visible fragments are removed and the free fibre content is below 0.1%, the soils would become non-hazardous waste (17-05-04, assuming no other hazardous properties have been identified in that material).



Waste Related Recommendations

- 7.7 As noted above, it is advisable that the waste producer considers the classification of soils above in the context of the exploratory locations advanced in this investigation and the actual locations and depths of soils requiring disposal (once this information is known).
- 7.8 If any tanks, drums, scrap metal or other wastes are present on site, these will require separate assessment and disposal to remove these materials. Records should be kept of the removal of these waste items.
- 7.9 In addition, the following site-specific recommendations are made regarding waste classification. It is noted that these recommendations only apply if soils in these locations require excavation and off-site disposal; if soils in these locations remain in-situ, these points do not require actioning):
- ▶ Quantification is recommended on all samples found to contain asbestos (if not already undertaken).
 - ▶ Visible fragments of ACM will require removal from the soils by hand picking, undertaken under a suitable safe system of work. ACM should be stored in an asbestos skip and disposed of appropriately.
 - ▶ Any oversized, non-inert and non-soil materials within the Made Ground (such as construction waste, metals, plastic and wood) should be segregated from the Made Ground for separate and appropriate disposal or recovery.
 - ▶ Delineation through sampling and laboratory testing of the identified hazardous soils listed above to determine their extent (*Insert locations*) – to inform appropriate waste management practices.
 - ▶ Further testing of soils in-situ to fully characterise the Made Ground across the site and inform waste disposal. This is required due to the identification of the material having variable classifications across the site including both hazardous and non-hazardous properties. Due to the sporadic distribution of the hazardous materials and lack of suitable visual or olfactory identifying characteristics, the current dataset is insufficient to appropriately classify the material in between the immediate vicinity of the exploratory locations.



- ▶ WAC testing may be required by the waste recipient if the disposal route is likely to be an inert landfill or a hazardous landfill.

General Responsibilities (Waste)

- 7.10 The Client and contractors involved in the excavation, segregation and off-site disposal are responsible for the correct management and pre-treatment of waste spoil generated by all earthworks. These parties have a duty of care which requires suitable management and disposal of wastes in accordance with the regulations. Given that Lustre does not have any significant involvement during the earthworks phase, full responsibility for waste management rests with the principal contractor/waste producer.
- 7.11 The waste producer must retain a copy of *all* waste consignment notes, waste hauler documentation and waste recipient documentation and licenses.

Preferential Pathways (Foundations)

- 7.12 Deep foundations could result in the creation of preferential pathways and movement of potentially contaminated soils to depth. Depending on the site circumstances, these processes can result in a deterioration of groundwater quality. Further investigation may be required to clarify this risk if deeper foundations are chosen.

Increased Infiltration

- 7.13 Through the creation of soft landscaping or the placement of soakaways to manage surface water drainage, developments can increase the volume and location of infiltration. This can in turn lead to the mobilisation of contamination within soils (if present) and can result in a deterioration of groundwater quality. The development proposals will reduce the amount of infiltration and formalise drainage. This will have a positive impact on the rates of any leaching and/or mobilisation of contaminants in the subsurface. The minimum depth of discharge from any soakaways must be below the base of any Made Ground; surface water should not be discharged from soakaways within the Made Ground.

Permeability of Soils

- 7.14 The soil infiltration rate at the location of any soakaways should be determined through infiltration testing.



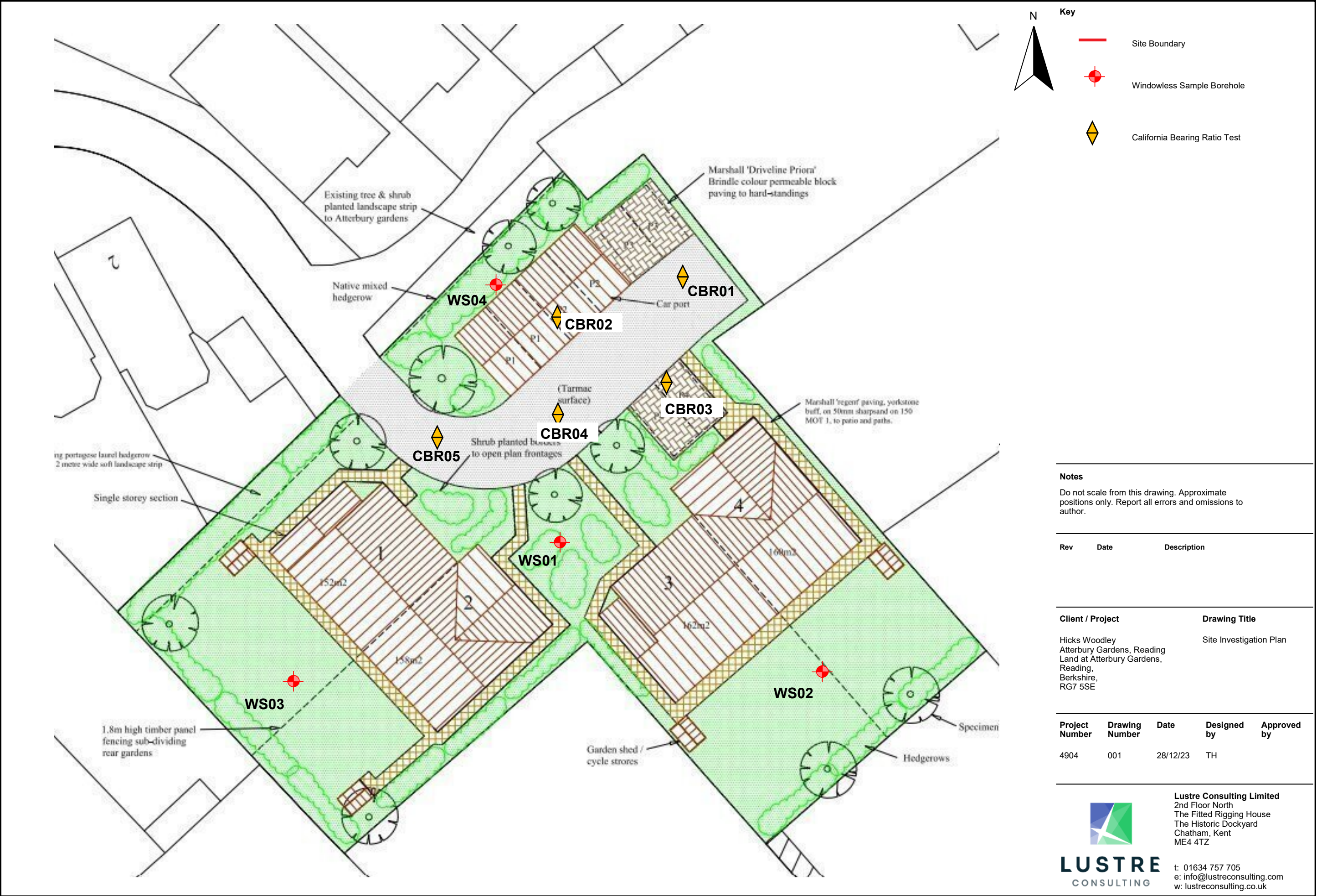
Asbestos in Soils

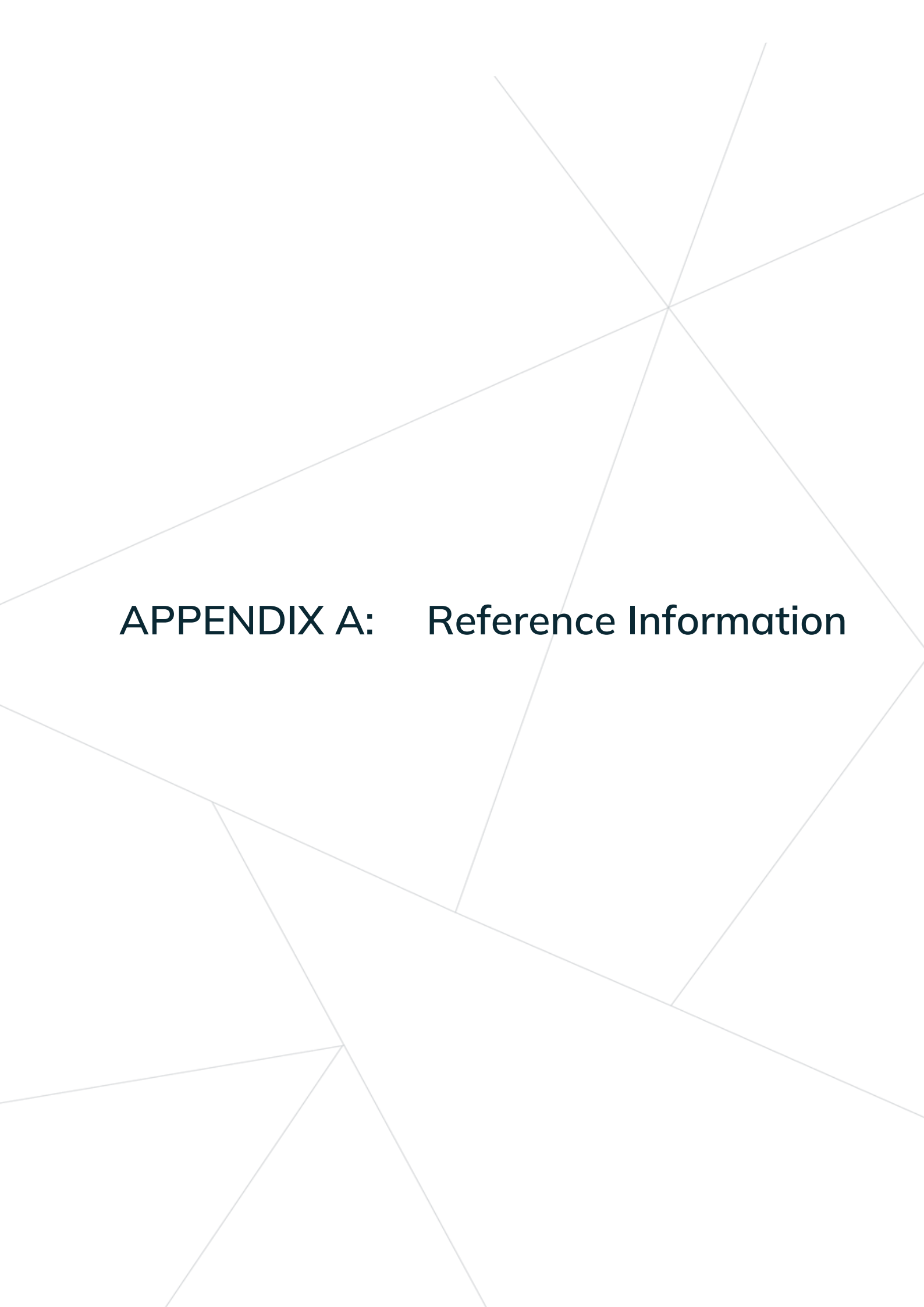
- 7.15 This report does not specifically consider the risk from asbestos in soils to construction workers. It is generally recommended that if asbestos has been recorded in soils on site, the groundworks contractor should prepare a detailed method statement for the excavation, handling and storage of asbestos contaminated soil (ACS), in addition to implementing an asbestos watching brief. As a minimum, the groundworks contractor should hold the appropriate level of asbestos awareness training and be competent in managing ACS. The risk from asbestos to groundworkers should be clearly understood and communicated to those working with soils on site.

Imported Soils and Recycled Crush

- 7.16 Any soils or crushed concrete imported to site during the development which will be retained on site should be checked to ensure they do not contain contaminants which may pose a risk to future site users. Evidence of due diligence in this regard is often requested by regulators to demonstrate that imported materials do not contain contaminants such as asbestos

Drawings





APPENDIX A: Reference Information

PHASE 2 REFERENCE INFORMATION

APPROACH TO INVESTIGATIONS & CONTAMINATED LAND DEFINITIONS

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Environmental site investigations are prepared in keeping with best practice and current planning guidance, where practicable and in accordance with the approved scope of work. The National Planning Policy Framework (NPPF)⁸ advises regulatory consultees to ensure that adequate site investigation information is provided at the initial planning stage, whilst the Land contamination risk management guidance (LCRM, October 2020) requires a phased, risk based approach when dealing with land affected by contamination in the UK.

References to the term “contaminated land” in our reports relate to the statutory definition of contaminated land under the recently published Contaminated Land Statutory Guidance unless otherwise stated (also known as Category 1 and 2 under Part 2A). That definition is: “any land which appears to the Local Authority in whose area it is situated to be in such a condition, by reason of substances on in or under the land that –

- a) Significant harm is being caused or there is a significant possibility of such harm being caused; or
- b) Significant pollution of water environment is being caused or there is significant possibility of such pollution being caused”.

Other terms such as “land affected by contamination” or “land contamination” refer to the much broader categories of land where contaminants are present but usually not at a significant level of risk to be classified as contaminated land under the definition Part 2A (also known as Category 3 or Category 4 under Part 2A).

The National Planning Policy Framework (NPPF) states that “land should be suitable for its new use and as a minimum, after carrying out remediation (if required), the land should not be capable of being determined as contaminated land under Part 2A of the Environmental Protection Act 1990”.

NOTES ON LOGGING & SAMPLING

[RETURN](#)

For all exploratory holes excavated, soil arisings are recovered and logged to BS5930: 2015⁹. Where possible, observations on groundwater ingress and excavation stability are made. Soil arisings are then typically inspected for visual and olfactory evidence of contamination with samples recovered at varying depths for analysis depending on the scope of works. Disturbed and undisturbed samples (where applicable) are taken in accordance with guidance and deposited in suitable containers, prepared and dispatched to a UKAS (United Kingdom Accreditation Service) accredited laboratory.

If appropriate to the nature of the works, soil samples from the Made Ground or potentially contaminated soils are also deposited in sealable plastic bags to allow on-site headspace analysis. Samples are then left for at least 20 minutes before analysis and a photo-ionisation detector (PID) with 10.6eV lamp used to measure the concentration of volatile organic compounds (VOC) within the headspace. Soil samples are gently agitated during analysis to encourage the release of any volatiles.

[RETURN](#)

⁸ Department for Communities and Local Government, National Planning Policy Framework, 2019.

⁹ British Standard – Code of Practice for Site Investigation. BS 5939: 2015.

QUANTITATIVE RISK ASSESSMENTS

Human Health GQRA

To determine whether contamination presents an unacceptable level of risk to human health, concentrations of potential contaminants are screened against risk threshold values. Historically, these values had been in the form of Generic Assessment Criteria (GAC) and Soil Guideline Values (SGVs), published by regulatory and advisory bodies. However, in response to revised Part 2A Statutory Guidance, Defra published Category 4 Screening Levels (C4SLs) for six determinands to provide a simple test for deciding when land is 'suitable for use' and demonstrably not 'contaminated land'. The supporting documentation from Defra¹⁰ acknowledges that where C4SLs exist, these values represent a greater risk threshold (i.e. low risk) rather than the previous SGVs/GACs (i.e. no risk). Acknowledging that the C4SLs were primarily intended for use under Part 2A Statutory Guidance, LQM in collaboration with the Chartered Institute of Environmental Health (CIEH), subsequently published a third set of generic assessment criteria known as LQM/CIEH Suitable 4 Use Levels (S4ULs)¹¹. The S4ULs are based on the 'minimal or tolerable level of risk' as defined in previous Environment Agency guidance (namely SR2¹²) which underpinned all previous SGVs/GACs. The National Planning Policy Framework (NPPF)¹³ requires that planning decisions undertaken by the Local Planning Authority should decide if a site is suitable for its new use and not just whether the site is determinable under Part 2A. Whilst Defra states that the C4SLs could be applied under the planning regime, it is acknowledged that these screening levels were primarily published to support the Part 2A Statutory Guidance. Taking this into account, the S4ULs are often used in the first instance. Where an exceedance above these levels is identified, comparison against C4SLs will generally be undertaken, with consideration given to the applicability of a less conservative threshold.

Water Pipeline Suitability Test

Often, at the time of site investigation, the route of any proposed potable water pipes are not known, or are largely inaccessible if an existing development is present. As such, potable water pipe assessments are based on the shallow soils across the site as a whole. In accordance with UKWIR guidance, we consider determinands for assessment based on the historical use of the site. Available analytical data is then compared against the UKWIR thresholds. The assessment of ethers, nitrobenzene, ketones, aldehydes and amines are often not considered applicable. The assessment of mineral oil is undertaken using the results from any speciated TPH test data, which provides a breakdown of the hydrocarbon fractions.

Groundwater GQRA

When assessing the risks to groundwater, the screening criteria adopted includes the UK Drinking Water Standards (DWS) as specified in Water Quality Regulations 2000¹⁴, Environmental Quality Standards (EQS) for freshwater¹⁵ and World Health Organisation (WHO) standards for drinking water quality¹⁶. The hierarchy that these are adopted is based on the conceptual site model and the most sensitive receptors in the context of the site and the local use of any groundwater. In the absence of UK published guidance values for total petroleum hydrocarbons, the WHO guideline values (provided in Petroleum Products

¹⁰ SP1010: Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination – Policy Companion Document, March 2014

¹¹ The LQM/CIEH S4ULs for Human Health Risk Assessment, 2015. Copyright Land Quality Management Limited reproduced with permission; Publication Number S4UL3455. All rights reserved

¹² Environment Agency, Human Health Toxicological Assessment of Contaminants in Soil (SR2), January 2009

¹³ Department for Communities and Local Government, National Planning Policy Framework, 2019

¹⁴ The Water Supply (Water Quality) Regulations 2000

¹⁵ Environmental Quality Standards, The Water Supply (Water Quality) Regulations 2002

¹⁶ World Health Organisation (WHO) Guidelines for Drinking Water Quality, 1984

in Drinking Water guidance) are adopted¹⁷. The use of the lowest screening criteria for an individual TPH fraction has been adopted as set out in the guidance, which provides a conservative assessment for TPH.

Ground Gas Risk Assessments

Ground gases such as methane and carbon dioxide can be generated naturally from the ground, particularly where decaying organic matter is present. These gases can also be generated by buried degradable waste or other organic compounds in Made Ground / infilled ground. Carbon dioxide and methane can migrate through the soil over significant distances and enter buildings via the subfloor void or other entry points. The hazard associated with methane is explosion, whilst for carbon dioxide the hazard is asphyxiation, particularly in confined spaces. BS 8485:2015¹⁸ sets out a series of gas screening values to enable the assessment of risk, depending on the type and sensitivity of the proposed buildings on site.

CONCEPTUAL MODEL & QUALITATIVE RISK ASSESSMENTS

RETURN

The objective of a conceptual model is to firstly identify potential contaminant sources, pathways and receptors relating to the site and surrounding area based on the findings of this investigation. This information is then collated, and a qualitative risk assessment carried out in line with good practice and current guidance^{19,20} to assess any viable source-pathway-receptor pollution linkages. The potential for a pollution event to occur is then evaluated using a risk classification tool²¹. The level of risk is assigned by considering the likelihood that a pollution event might occur with the consequence its occurrence. The consequence is essentially a measurement of the severity of a hazard or source (e.g. contaminated soil) and sensitivity of the receptor (e.g. aquifer type or end user).

REMEDIATION AND VALIDATION

RETURN

Following the identification of unacceptable risks to receptors in a site investigation, either more investigation is required to better understand the risk, or often remediation is required. Remediation aims to lower the risk to an acceptable level by either removing the source or breaking / reducing the pathway. The methodology for carrying out any remediation is documented in a Remediation Strategy, and typically forms the third stage in the iterative risk-based approach. The strategy requires regulatory approval before commencing the actual remedial work. Remediation requires careful management and planning, with inspections and testing by the consultant to verify that the remediation has been undertaken in accordance with Remediation Strategy. Information collected over the course of the remedial work is then compiled into a Verification Report in line with the Environment Agency's Evidence, Verification of Remediation of Land Contamination²².

NOTES ON WASTE CLASSIFICATION (SOILS)

RETURN

Guidance set out in the Waste Framework Directive and the Environment Agency's Technical Guidance WM3 Hazardous Waste , provides information and controls on how sites should manage and control waste soils. The first stage of the waste assessment, as set out in Technical Guidance WM3 Hazardous Waste, requires the chemical composition of the soils to be

¹⁷ Petroleum Products in Drinking-water, WHO (WHO/SDE/WSH/05.08/123)

¹⁸ BS 8485:2015+A1:2019 Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings.

¹⁹ Guidance for the Safe Development of Housing on Land Affected by Contamination R&D66, NHBC, 2008.

²⁰ Construction Industry Research and Information Association (CIRIA). Contaminated Land Risk Assessment. A Guide to Good Practice. CIRIA C552 2001.

²¹ Department of the Environment, Transport and the Regions, Environment Agency and Institute of Environmental Health. Guidelines for Environmental Risk Assessment and Management. HMSO July 2000.

²² Environment Agency, Evidence, Verification of Remediation of Land Contamination, SC030114/R1, 2010

determined by analytical testing, in order to determine if the soils should be classified as hazardous or not hazardous. The second stage requires a Waste Acceptance Criteria (WAC) test to determine the case of inert or non-hazardous waste disposal routes for the soil. Landfills have set criteria for wastes which they can legally accept, and the WAC test therefore provides information on which type of landfill can accept the waste.

Only contaminated soils which are excavated will require classification and assessment for waste disposal as under the Waste Framework Directive, as these soils cannot be re-used on site. In-situ, unexcavated contaminated soils do not require classification. Also uncontaminated soils and other naturally occurring material excavated in the course of construction activities, when it is certain that the material will be used for the purposes of construction in its natural state, on the site from which it was excavated, also do not require classification.

Waste Classification Methodology

The first stage of this assessment is to assign a waste code to the soils requiring classification. This is obtained from the 20 Chapters of The List of Waste (England) Regulations 2005 and includes the consideration of both mirror entries and absolute entries. For mirror entries the soils requiring disposal will be assessed within the HazWasteOnline tool to determine if hazardous properties are present and therefore if the mirror hazardous or mirror non-hazardous code is applicable to the waste classification.

The results of the laboratory analysis are screened in a propriety hazardous waste assessment tool (HazWasteOnline) to determine if the soils would be considered hazardous from a waste disposal perspective. Concentrations of each contaminant are screened to determine if they exceed any of the sixteen hazardous properties (HP) and/or statements as set out the Environment Agency's Technical Guidance WM3 (Guidance on the classification and assessment of waste, 1st edition 2015).

The initial waste assessment on HazWasteOnline identifies those contaminants which exceed any of the sixteen hazardous properties / statements. This is based on the presence of individual anions or cations identified during the chemical analysis of the soils. However, this analysis does not always identify which specific components are present. Where possible, further information has been obtained on which precise substances are likely to be present within the soils, based on the known historical and current site uses and operations. This information can be used to rule out the presence of 'worst case' substances within the HazWasteOnline tool. Further information on the specific assumptions made during the waste assessment are provided in the Assumptions Section below and in the HazWasteOnline output sheet included as an attachment to this letter report.

Following the application of project specific assumptions, a detailed waste assessment has been generated. As part of the detailed waste assessment, consideration has also been given to whether the soils should be considered as a single population or as sub populations based on field observations or the presence of specific contaminants.

Waste Assessment Assumptions

Based on our current understanding of historical and current site operations, the following assumptions have been applied within the HazWasteOnline tool, unless explicitly stated in Chapter 7:

- HP3 Flammable has been discounted as a viable Hazardous Property as the soils considered within this assessment are a solid waste without a free draining liquid phase. This is likely due to advice from the laboratory indicates that testing for flammability was not appropriate due to the low level of TPH. The waste does not display this hazardous property.

- Metallic compounds are not considered to be present in their chromate form as the laboratory analysis has demonstrated that insufficient concentrations of hexavalent chromium are present to enable the formation of chromates within the soils.
- Based on the data available it is considered likely that any metallic compounds present within the soils underlying the site are most likely present in their oxide form, rather than as chlorides, sulphates, sulphides, carbonates or phosphates.

APPENDIX B: Exploratory Hole Logs



LUSTRE
CONSULTING

Borehole Log

Borehole No.

WS01

Sheet 1 of 1

Project Name: Atterbury Gardens, Reading

Project No.
4904

Co-ords: -

Hole Type
WS

Location: Reading

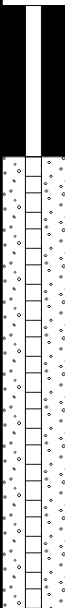
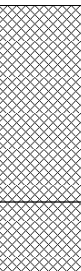
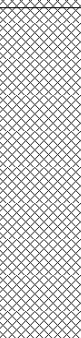
Level:

Scale
1:50

Client: Hicks-Woodley

Dates: 18/01/2024 -

Logged By
Toby Hill

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.30 - 0.40	ES	N=19 (4,6/8,5,4,2)	1.30			Soft brown slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is medium to coarse subangular to subrounded of flint. (MADE GROUND)	1
		0.70 - 0.80	ES						
		1.00 - 1.10	D						
		1.20							
		1.40 - 1.50	ES	N=2 (1,0/1,0,1,0)	1.80			Medium dense brown very clayey sandy fine to coarse angular to subangular GRAVEL of flint. Sand is fine to coarse. (MADE GROUND)	2
		2.00							
		2.00 - 2.10	D					Soft brown slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is medium to coarse subangular to subrounded of flint. (MADE GROUND)	
								<u>Poor soil recovery (<30%)</u>	
		3.00		N=1 (1,0/0,1,0,0)					3
		3.00 - 3.10	D						
		4.00		N=4 (1,1/1,1,1,1)	4.00				4
		4.00 - 4.10	D					End of borehole at 4.00 m	
									5
									6
									7
									8
									9
									10

Remarks

Hand pitting carried out.





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Borehole Log

Borehole No.

WS02

Sheet 1 of 1

Project Name: Atterbury Gardens, Reading

Project No.
4904

Co-ords: -

Hole Type
WS

Location: Reading

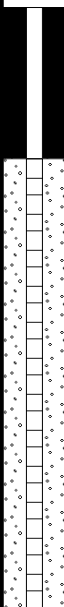
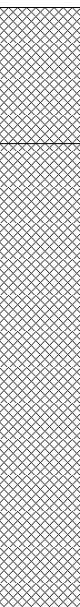
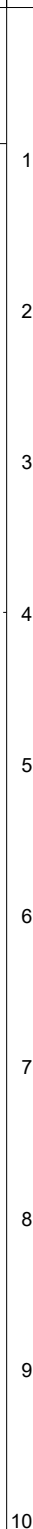
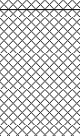
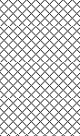
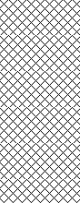
Level:

Scale
1:50

Client: Hicks-Woodley

Dates: 18/01/2024 -

Logged By
Toby Hill

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description		
		Depth (m)	Type	Results						
		0.50 - 0.60	ES	N=4 (1,1/1,0,1,2)	0.90		Soft brown slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is medium to coarse subangular to subrounded of flint. (MADE GROUND)			
		0.80 - 0.90	D							
		1.00 - 1.10	ES							
		1.20					Soft to firm black mottled brown slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is fine to coarse angular to subrounded of brick, concrete, wood, tile, glass, flint. (MADE GROUND)			
		2.00								
		2.50 - 2.60	ES	N=7 (2,2/1,2,2,2)	 <i>No soil recovery</i>					
		3.00								
		4.00		N=14 (2,3/3,4,2,5)	4.00					
End of borehole at 4.00 m										

Remarks
Hand pitting carried out.





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Borehole Log

Borehole No.

WS03

Sheet 1 of 1

Project Name: Atterbury Gardens, Reading

Project No.
4904

Co-ords: -

Hole Type
WS

Location: Reading

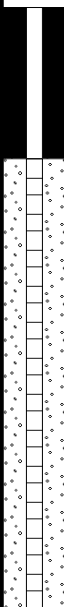
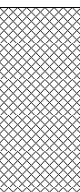
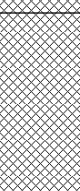
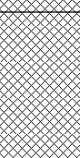
Level:

Scale
1:50

Client: Hicks-Woodley

Dates: 18/01/2024 -

Logged By
Toby Hill

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description		
		Depth (m)	Type	Results						
		0.50 - 0.60	ES					Soft brown slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is medium to coarse subangular to subrounded of flint. (MADE GROUND)	1	
		1.00 - 1.10 1.20	D	N=2 (1,0/1,0,1,0)	1.30					
		1.60 - 1.70	ES					Soft brown slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is medium to coarse subangular to subrounded of flint. (MADE GROUND)	2	
		2.00 2.00 - 2.10	D	N=5 (1,1/1,1,1,2)						
		<u>Poor soil recovery (<30%)</u>								
		3.00 3.00 - 3.10	D	N=23 (4,4/5,6,6,6)	3.00			Loose to Medium Dense brown very clayey sandy fine to coarse angular to subangular GRAVEL of flint. Sand is fine to coarse. (MADE GROUND)	3	
		4.00 4.00 - 4.10	D	N=6 (3,1/1,1,2,2)	4.00				4	
End of borehole at 4.00 m									4	
									5	
									6	
									7	
									8	
									9	
									10	

Remarks

Hand pitting carried out.





Borehole Log

Borehole No.

WS04

Sheet 1 of 1

Project Name: Atterbury Gardens, Reading

Project No.
4904

Co-ords: -

Hole Type
WS

Location: Reading

Level:

Scale
1:50

Client: Hicks-Woodley

Dates: 18/01/2024 -

Logged By
Toby Hill

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.20 - 0.30	ES	N=8 (3,3/2,2,2,2)	1.90			Soft brown slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is medium to coarse subangular to subrounded of flint. (MADE GROUND)	1
		0.70 - 0.80	ES						
		1.00 - 1.10	D						
		1.20							
		1.50 - 1.60	ES	N=12 (2,2/3,3,3,3)				Recovered as structureless CHALK composed of white gravelly SILT. Gravel is weak, low density, white angular to subangular chalk. (SEAFORD CHALK FORMATION AND NEWHAVEN CHALK FORMATION)	2
		2.00							
		2.00 - 2.15	D						
		2.50 - 2.60	ES	N=8 (2,2/3,1,2,2)					3
		3.00							
		3.00 - 3.15	D	N=7 (4,2/2,1,2,2)	4.00				4
		4.00							
		4.00 - 4.15	D					End of borehole at 4.00 m	4
									5
									6
									7
									8
									9
									10

Remarks
Hand pitting carried out.





Probe Log

Borehole No.

WS01

Sheet 1 of 2

Project Name: Atterbury Gardens, Reading

Project No.
4904

Co-ords: -

Hole Type
WS

Location: Reading

Level:

Scale
1:30

Client: Hicks Woodley

Dates: 18/01/2024 -

Logged By
Toby Hill

Depth (m)	Blows/100mm					Torque (Nm)
	10	20	30	40		
1						
2						
3						
4						
5						
6						

Remarks
Hand pitting carried out.

Fall Height 750

Cone Base Diameter

Hammer Wt 64

Final Depth 7.00

Probe Type DPSH-B

Log Scale 1:30





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Probe Log

Borehole No.

WS01

Sheet 2 of 2

Project Name: Atterbury Gardens, Reading

Project No.
4904

Co-ords: -

Hole Type
WS

Location: Reading

Level:

Scale
1:30

Client: Hicks Woodley

Dates: 18/01/2024 -

Logged By
Toby Hill

Depth (m)	Blows/100mm				Torque (Nm)
	10	20	30	40	
6	1 2 1 1 1 1 1				0 0 0 0 0 0 0
7	3 3 5 4				0 0 0 0 0
8					
9					
10					
11					
12					

Remarks
Hand pitting carried out.

Fall Height 750

Cone Base Diameter

Hammer Wt 64

Final Depth 7.00

Probe Type DPSH-B

Log Scale 1:30





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Probe Log

Borehole No.

WS02

Sheet 1 of 2

Project Name: Atterbury Gardens, Reading

Project No.
4904

Co-ords: -

Hole Type
WS

Location: Reading

Level:

Scale
1:30

Client: Hicks Woodley

Dates: 18/01/2024 -

Logged By
Toby Hill

Depth (m)	Blows/100mm					Torque (Nm)
	10	20	30	40		
1						
2						
3						
4	0 1 1 3 1					10 10 10 10 10 10 10 10 10 10
5	0 1 1 1 1 1 1 1 1 1 1 1 1 1 1					0 0 0 0 0 10 0 0 0 0 0 0 0 0
6	1					10

Remarks
Hand pitting carried out.

Fall Height 750

Cone Base Diameter

Hammer Wt 64

Final Depth 4.00

Probe Type DPSH-B

Log Scale 1:30





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Probe Log

Borehole No.

WS02

Sheet 2 of 2

Project Name: Atterbury Gardens, Reading

Project No.
4904

Co-ords: -

Hole Type
WS

Location: Reading

Level:

Scale
1:30

Client: Hicks Woodley

Dates: 18/01/2024 -

Logged By
Toby Hill

Depth (m)	Blows/100mm				Torque (Nm)
	10	20	30	40	
7	1				10
	1				10
	1				10
	1				10
	1				10
	1				10
	1				10
	1				10
	2				10
	1				10
8	2				30
	2				30
	1				30
	2				30
	2				30
	2				30
	1				30
	3				30
	4				30
	5				30
9	4				30
	5				30
	4				30
	7				30
	7				30
	9				30
	7				30
	7				30
	6				30
	6				30
10	6				30
	8				30
	9				30
	8				30
	9				30
	11				30
	10				30
	10				30
	11				30
	7				30
11	8				30
12					

Remarks
Hand pitting carried out.

Fall Height 750

Cone Base Diameter

Hammer Wt 64

Final Depth 4.00

Probe Type DPSH-B

Log Scale 1:30





Probe Log

Borehole No.

WS03

Sheet 1 of 2

Project Name: Atterbury Gardens, Reading

Project No.
4904

Co-ords: -

Hole Type
WS

Location: Reading

Level:

Scale
1:30

Client: Hicks Woodley

Dates: 18/01/2024 -

Logged By
Toby Hill

Depth (m)	Blows/100mm				Torque (Nm)
	10	20	30	40	
1					
2					
3					
4					
5					
6					

Remarks
Hand pitting carried out.

Fall Height 750

Cone Base Diameter

Hammer Wt 64

Final Depth 4.00

Probe Type DPSH-B

Log Scale 1:30





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Probe Log

Borehole No.

WS03

Sheet 2 of 2

Project Name: Atterbury Gardens, Reading

Project No.
4904

Co-ords: -

Hole Type
WS

Location: Reading

Level:

Scale
1:30

Client: Hicks Woodley

Dates: 18/01/2024 -

Logged By
Toby Hill

Depth (m)	Blows/100mm				Torque (Nm)
	10	20	30	40	
0					0
0.1					0
0.2					0
0.3					0
0.4					0
0.5					0
0.6					0
0.7					0
0.8					0
0.9					0
1.0					0
1.1					0
1.2					0
1.3					0
1.4					0
1.5					0
1.6					0
1.7					0
1.8					0
1.9					0
2.0					0
2.1					0
2.2					0
2.3					0
2.4					0
2.5					0
2.6					0
2.7					0
2.8					0
2.9					0
3.0					0
3.1					0
3.2					0
3.3					0
3.4					0
3.5					0
3.6					0
3.7					0
3.8					0
3.9					0
4.0					0
4.1					0
4.2					0
4.3					0
4.4					0
4.5					0
4.6					0
4.7					0
4.8					0
4.9					0
5.0					0
5.1					0
5.2					0
5.3					0
5.4					0
5.5					0
5.6					0
5.7					0
5.8					0
5.9					0
6.0					0
6.1					0
6.2					0
6.3					0
6.4					0
6.5					0
6.6					0
6.7					0
6.8					0
6.9					0
7.0					0
7.1					0
7.2					0
7.3					0
7.4					0
7.5					0
7.6					0
7.7					0
7.8					0
7.9					0
8.0					0
8.1					0
8.2					0
8.3					0
8.4					0
8.5					0
8.6					0
8.7					0
8.8					0
8.9					0
9.0					0
9.1					0
9.2					0
9.3					0
9.4					0
9.5					0
9.6					0
9.7					0
9.8					0
9.9					0
10.0					0
10.1					0
10.2					0
10.3					0
10.4					0
10.5					0
10.6					0
10.7					0
10.8					0
10.9					0
11.0					0
11.1					0
11.2					0
11.3					0
11.4					0
11.5					0
11.6					0
11.7					0
11.8					0
11.9					0
12.0					0

Remarks

Hand pitting carried out.

Fall Height 750

Hammer Wt 64

Probe Type DPSH-B

Cone Base Diameter

Final Depth 4.00

Log Scale 1:30





Probe Log

Borehole No.

WS04

Sheet 1 of 2

Project Name: Atterbury Gardens, Reading

Project No.
4904

Co-ords: -

Hole Type
WS

Location: Reading

Level:

Scale
1:30

Client: Hicks Woodley

Dates: 18/01/2024 -

Logged By
Toby Hill

Depth (m)	Blows/100mm					Torque (Nm)
	10	20	30	40		
1						
2						
3						
4	0 0 0 0 0 0 0 0 3 5 4 3 5 6 6 10 6 6 10 11 8 7					10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 0
5						
6						

Remarks
Hand pitting carried out.

Fall Height 750

Cone Base Diameter

Hammer Wt 64

Final Depth 4.00

Probe Type DPSH-B

Log Scale 1:30





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Probe Log

Borehole No.

WS04

Sheet 2 of 2

Project Name: Atterbury Gardens, Reading

Project No.
4904

Co-ords: -

Hole Type
WS

Location: Reading

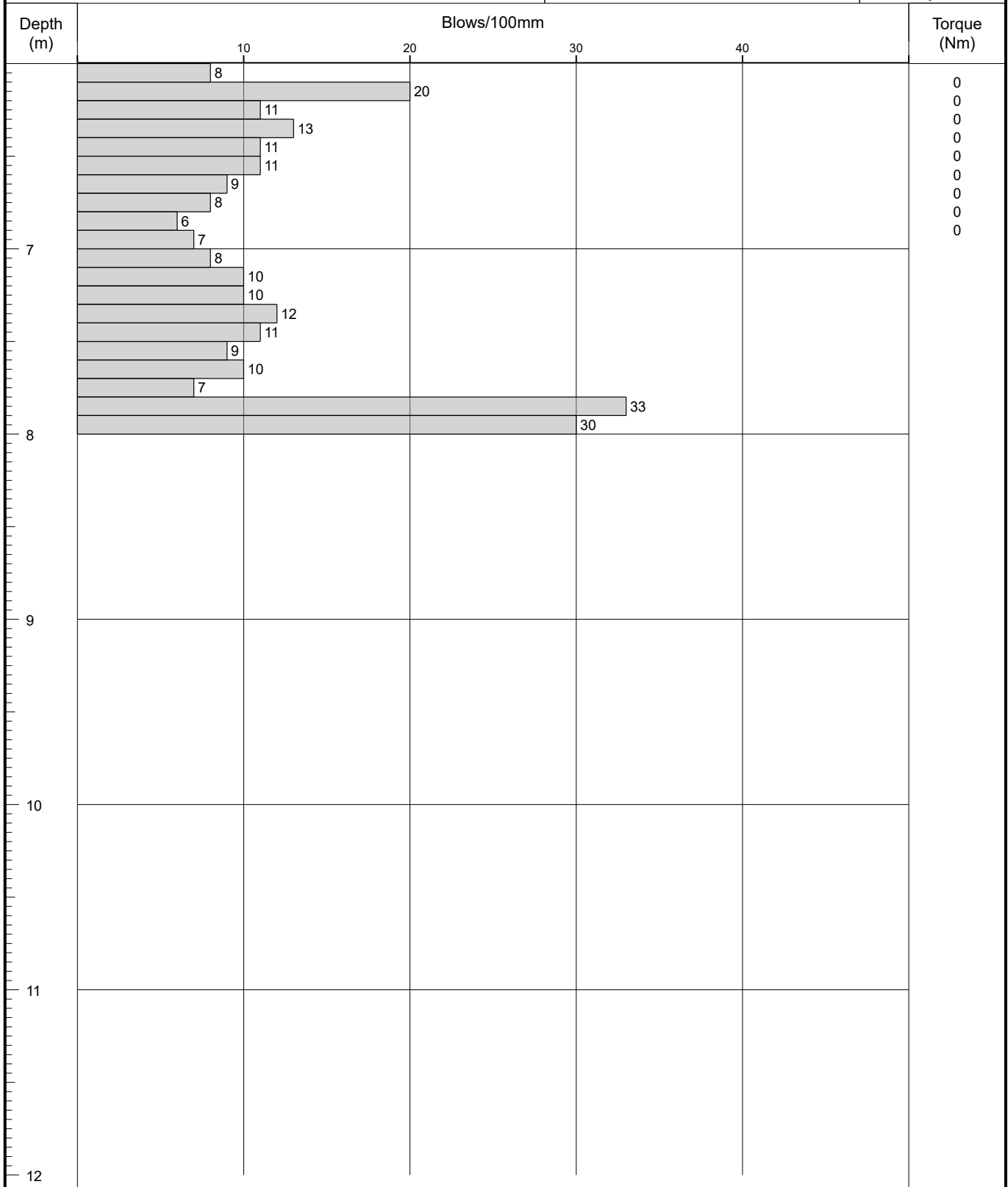
Level:

Scale
1:30

Client: Hicks Woodley

Dates: 18/01/2024 -

Logged By
Toby Hill



Remarks
Hand pitting carried out.

Fall Height 750

Cone Base Diameter

Hammer Wt 64

Final Depth 4.00

Probe Type DPSH-B

Log Scale 1:30





APPENDIX C: Laboratory Test Certificates

**Toby Hill**

Lustre Consulting Ltd
Suite 1
Second Floor North
The Fitted Rigging House
The Historic Dockyard
Chatham, Kent
ME4 4TZ

t: 01634 757 705

e: info@lustreconsulting.com

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

t: 01923 225404

f: 01923 237404

e: reception@i2analytical.com

Analytical Report Number : 24-79500

Replaces Analytical Report Number: 24-79500, issue no. 2

Additional analysis undertaken.

Asbestos Quantification added as per clients request

Project / Site name:	Atterbury Gardens Reading	Samples received on:	19/01/2024
Your job number:	4904	Samples instructed on/ Analysis started on:	24/01/2024
Your order number:	4904	Analysis completed by:	14/02/2024
Report Issue Number:	3	Report issued on:	15/02/2024
Samples Analysed:	7 soil samples		


Signed:

Adam Fenwick
Technical Reviewer
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

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

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: 24-79500
Project / Site name: Atterbury Gardens Reading
Your Order No: 4904

Lab Sample Number				2935233	2935234	2935235	2935236	2935237
Sample Reference				WS01	WS01	WS02	WS02	WS03
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.30	1.40	1.00	2.50	0.50
Date Sampled				18/01/2024	18/01/2024	18/01/2024	18/01/2024	18/01/2024
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	52	< 0.1	32
Moisture Content	%	0.01	NONE	10	8.9	10	12	6.8
Total mass of sample received	kg	0.001	NONE	1.3	1.6	1.7	1.1	1.2

Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	-	-	Chrysotile	-
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Detected	Not-detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-	-	-	< 0.001	-
Asbestos Quantification Total	%	0.001	ISO 17025	-	-	-	< 0.001	-
Asbestos Analyst ID	N/A	N/A	N/A	WEM	WEM	WEM	WEM	WEM

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	7.8	8	9.3	8.4	8.2
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	1	< 1.0
Water Soluble Sulphate as SO ₄ 16hr extraction (2:1)	mg/kg	2.5	MCERTS	12	19	180	77	24
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.0061	0.0093	0.0901	0.0387	0.012
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	6.1	9.3	90.1	38.7	12
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	1.3	0.6	1.1	1.9	0.6

Total Phenols

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

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	0.16	0.08	0.11	0.05
Acenaphthylene	mg/kg	0.05	MCERTS	0.07	0.11	< 0.05	0.12	0.09
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	0.06	< 0.05	0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	0.49	0.67	0.32	0.73	0.51
Anthracene	mg/kg	0.05	MCERTS	0.12	0.17	0.07	0.21	0.12
Fluoranthene	mg/kg	0.05	MCERTS	1.7	1.7	0.74	2.1	1.4
Pyrene	mg/kg	0.05	MCERTS	1.7	1.4	0.67	1.8	1.2
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.99	0.96	0.39	1	0.76
Chrysene	mg/kg	0.05	MCERTS	1.1	1.1	0.38	1.2	0.83
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	1.4	1.4	0.6	1.5	1.1
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	0.63	0.65	0.18	0.67	0.46
Benzo(a)pyrene	mg/kg	0.05	MCERTS	1.3	1.2	0.47	1.3	0.99
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.74	0.76	0.29	0.82	0.6
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	0.15	0.17	< 0.05	0.14	0.13
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.85	0.78	0.33	0.91	0.67

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	11.3	11.3	4.52	12.7	8.9
-----------------------------	-------	-----	-----------	------	------	------	------	-----

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	14	16	21	27	18
Boron (water soluble)	mg/kg	0.2	MCERTS	< 0.2	0.5	0.4	2.3	< 0.2
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	5.7	4.6	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	120	180	150	61	120
Copper (aqua regia extractable)	mg/kg	1	MCERTS	22	16	130	470	15
Lead (aqua regia extractable)	mg/kg	1	MCERTS	66	38	390	600	170

Analytical Report Number: 24-79500
Project / Site name: Atterbury Gardens Reading
Your Order No: 4904

Lab Sample Number				2935233	2935234	2935235	2935236	2935237
Sample Reference				WS01	WS01	WS02	WS02	WS03
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.30	1.40	1.00	2.50	0.50
Date Sampled				18/01/2024	18/01/2024	18/01/2024	18/01/2024	18/01/2024
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	0.3	6.8	6.7	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	19	20	29	38	22
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	110	59	230	540	61

Monoaromatics & Oxygenates

Benzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Toluene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Ethylbenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
p & m-xylene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
o-xylene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6 _{HS_1D_AL}	mg/kg	0.02	NONE	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020
TPH-CWG - Aliphatic >EC6 - EC8 _{HS_1D_AL}	mg/kg	0.02	NONE	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020
TPH-CWG - Aliphatic >EC8 - EC10 _{HS_1D_AL}	mg/kg	0.05	NONE	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
TPH-CWG - Aliphatic >EC10 - EC12 _{EH_CU_1D_AL}	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16 _{EH_CU_1D_AL}	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21 _{EH_CU_1D_AL}	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35 _{EH_CU_1D_AL}	mg/kg	8	MCERTS	< 8.0	< 8.0	34	< 8.0	< 8.0
TPH-CWG - Aliphatic (EC5 - EC35) _{EH_CU+HS_1D_AL}	mg/kg	10	NONE	< 10	< 10	38	< 10	< 10

TPH-CWG - Aromatic >EC5 - EC7 _{HS_1D_AR}	mg/kg	0.01	NONE	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
TPH-CWG - Aromatic >EC7 - EC8 _{HS_1D_AR}	mg/kg	0.01	NONE	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
TPH-CWG - Aromatic >EC8 - EC10 _{HS_1D_AR}	mg/kg	0.05	NONE	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
TPH-CWG - Aromatic >EC10 - EC12 _{EH_CU_1D_AR}	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16 _{EH_CU_1D_AR}	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aromatic >EC16 - EC21 _{EH_CU_1D_AR}	mg/kg	10	MCERTS	< 10	11	< 10	< 10	< 10
TPH-CWG - Aromatic >EC21 - EC35 _{EH_CU_1D_AR}	mg/kg	10	MCERTS	17	14	< 10	13	< 10
TPH-CWG - Aromatic (EC5 - EC35) _{EH_CU+HS_1D_AR}	mg/kg	10	NONE	24	25	< 10	22	13

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

Analytical Report Number: 24-79500
Project / Site name: Atterbury Gardens Reading
Your Order No: 4904

Lab Sample Number				2935238	2935239
Sample Reference				WS04	WS04
Sample Number				None Supplied	None Supplied
Depth (m)				0.20	0.70
Date Sampled				18/01/2024	18/01/2024
Time Taken				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	13	13
Total mass of sample received	kg	0.001	NONE	1	1.1

Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	-
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-	-
Asbestos Quantification Total	%	0.001	ISO 17025	-	-
Asbestos Analyst ID	N/A	N/A	N/A	WEM	WEM

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8.1	8.3
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0
Water Soluble Sulphate as SO ₄ 16hr extraction (2:1)	mg/kg	2.5	MCERTS	31	88
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.0154	0.0442
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	15.4	44.2
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	2.6	1

Total Phenols

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

Naphthalene	mg/kg	0.05	MCERTS	0.11	0.05
Acenaphthylene	mg/kg	0.05	MCERTS	0.08	0.06
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	0.41	0.28
Anthracene	mg/kg	0.05	MCERTS	0.09	0.06
Fluoranthene	mg/kg	0.05	MCERTS	1.2	0.96
Pyrene	mg/kg	0.05	MCERTS	1.1	0.86
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.61	0.53
Chrysene	mg/kg	0.05	MCERTS	0.73	0.57
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	0.9	0.75
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	0.39	0.23
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.82	0.68
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.48	0.42
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	0.09	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.56	0.42

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	7.53	5.87
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Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	21	17
Boron (water soluble)	mg/kg	0.2	MCERTS	0.4	0.7
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	26	90
Copper (aqua regia extractable)	mg/kg	1	MCERTS	27	17
Lead (aqua regia extractable)	mg/kg	1	MCERTS	290	130

Analytical Report Number: 24-79500
Project / Site name: Atterbury Gardens Reading
Your Order No: 4904

Lab Sample Number				2935238	2935239
Sample Reference				WS04	WS04
Sample Number				None Supplied	None Supplied
Depth (m)				0.20	0.70
Date Sampled				18/01/2024	18/01/2024
Time Taken				None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status		
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	23	20
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	200	110

Monoaromatics & Oxygenates

Benzene	µg/kg	5	MCERTS	< 5.0	< 5.0
Toluene	µg/kg	5	MCERTS	< 5.0	< 5.0
Ethylbenzene	µg/kg	5	MCERTS	< 5.0	< 5.0
p & m-xylene	µg/kg	5	MCERTS	< 5.0	< 5.0
o-xylene	µg/kg	5	MCERTS	< 5.0	< 5.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	NONE	< 5.0	< 5.0

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6 _{HS_1D_AL}	mg/kg	0.02	NONE	< 0.020	< 0.020
TPH-CWG - Aliphatic >EC6 - EC8 _{HS_1D_AL}	mg/kg	0.02	NONE	< 0.020	< 0.020
TPH-CWG - Aliphatic >EC8 - EC10 _{HS_1D_AL}	mg/kg	0.05	NONE	< 0.050	< 0.050
TPH-CWG - Aliphatic >EC10 - EC12 _{EH_CU_1D_AL}	mg/kg	1	MCERTS	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16 _{EH_CU_1D_AL}	mg/kg	2	MCERTS	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21 _{EH_CU_1D_AL}	mg/kg	8	MCERTS	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35 _{EH_CU_1D_AL}	mg/kg	8	MCERTS	< 8.0	< 8.0
TPH-CWG - Aliphatic (EC5 - EC35) _{EH_CU+HS_1D_AL}	mg/kg	10	NONE	< 10	< 10

TPH-CWG - Aromatic >EC5 - EC7 _{HS_1D_AR}	mg/kg	0.01	NONE	< 0.010	< 0.010
TPH-CWG - Aromatic >EC7 - EC8 _{HS_1D_AR}	mg/kg	0.01	NONE	< 0.010	< 0.010
TPH-CWG - Aromatic >EC8 - EC10 _{HS_1D_AR}	mg/kg	0.05	NONE	< 0.050	< 0.050
TPH-CWG - Aromatic >EC10 - EC12 _{EH_CU_1D_AR}	mg/kg	1	MCERTS	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16 _{EH_CU_1D_AR}	mg/kg	2	MCERTS	< 2.0	< 2.0
TPH-CWG - Aromatic >EC16 - EC21 _{EH_CU_1D_AR}	mg/kg	10	MCERTS	< 10	< 10
TPH-CWG - Aromatic >EC21 - EC35 _{EH_CU_1D_AR}	mg/kg	10	MCERTS	< 10	< 10
TPH-CWG - Aromatic (EC5 - EC35) _{EH_CU+HS_1D_AR}	mg/kg	10	NONE	< 10	< 10

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



Analytical Report Number: 24-79500
Project / Site name: Atterbury Gardens Reading
Your Order No: 4904

Certificate of Analysis - Asbestos Quantification

Methods:

Qualitative Analysis

The samples were analysed qualitatively for asbestos by polarising light and dispersion staining as described by the Health and Safety Executive in HSG 248.

Quantitative Analysis

The analysis was carried out using our documented in-house method A006-PL based on HSE Contract Research Report No: 83/1996: Development and Validation of an analytical method to determine the amount of asbestos in soils and loose aggregates (Davies et al, 1996) and HSG 248. Our method includes initial examination of the entire representative sample, then fractionation and detailed analysis of each fraction, with quantification by hand picking and weighing.

The limit of detection (reporting limit) of this method is 0.001 %.

The method has been validated using samples of at least 100 g, results for samples smaller than this should be interpreted with caution.

Both Qualitative and Quantitative Analyses are UKAS accredited.

Sample Number	Sample ID	Sample Depth (m)	Sample Weight (g)	Asbestos Containing Material Types Detected (ACM)	PLM Results	Asbestos by hand picking/weighing (%)	Total % Asbestos in Sample
2935236	WS02	2.50	130	Loose Fibres	Chrysotile	< 0.001	< 0.001

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

Analytical Report Number : 24-79500
Project / Site name: Atterbury Gardens Reading

* 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 *
2935233	WS01	None Supplied	0.3	Brown loam and sand with gravel and vegetation.
2935234	WS01	None Supplied	1.4	Brown clay and sand with gravel and chalk.
2935235	WS02	None Supplied	1	Brown loam and sand with gravel and brick.
2935236	WS02	None Supplied	2.5	Brown loam and sand with gravel.
2935237	WS03	None Supplied	0.5	Brown clay and loam with gravel and vegetation.
2935238	WS04	None Supplied	0.2	Brown loam and clay with gravel and vegetation.
2935239	WS04	None Supplied	0.7	Brown loam and clay with gravel and vegetation.

Analytical Report Number : 24-79500

Project / Site name: Atterbury Gardens Reading

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 dispersion 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
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
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. Refer to CoA for analyte specific accreditation.	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
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Total organic carbon (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 and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS. Individual components MCERTS accredited	In-house method based on USEPA8260. Refer to CoA for analyte specific accreditation	L073B-PL	W	MCERTS
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID. Refer to CoA for band specific accreditation.	In-house method with silica gel split/clean up.	L088/76-PL	D	MCERTS
Asbestos Quantification - Gravimetric	Asbestos quantification by gravimetric method - in house method based on references.	HSE Report No: 83/1996, HSG 248, HSG 264 & SCA Blue Book (draft).	A006-PL	D	ISO 17025

Analytical Report Number : 24-79500

Project / Site name: Atterbury Gardens Reading

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
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in NaOH and addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	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 or A' analysis have been carried out in our laboratory in the United Kingdom (WATFORD).

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

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

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

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

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 : 24-79501

Replaces Analytical Report Number: 24-79501, issue no. 1

Client sampling date amended.

Sample Date Added To All Samples By Laboratory

Project / Site name:	Atterbury Gardens Reading	Samples received on:	19/01/2024
Your job number:	4904	Samples instructed on/ Analysis started on:	24/01/2024
Your order number:	4904	Analysis completed by:	01/02/2024
Report Issue Number:	2	Report issued on:	06/02/2024
Samples Analysed:	3 wac multi samples		

Izabela Wójcik
Signed:

Izabela Wójcik
Senior Reporting Specialist
For & on behalf of i2 Analytical Ltd.

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

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

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

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

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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:	24-79501						
					Client: LUSTRECONS		
Location	Atterbury Gardens Reading						
Lab Reference (Sample Number)	2935240				Landfill Waste Acceptance Criteria		
					Limits		
Sampling Date	18/01/2024				Inert Waste Landfill	Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill	Hazardous Waste Landfill
Sample ID	WS01						
Depth (m)	0.30						
Solid Waste Analysis							
TOC (%)**	0.9				3%	5%	6%
Loss on Ignition (%) **	3.1				--	--	10%
BTEX (µg/kg)**	< 10				6000	--	--
Sum of PCBs (mg/kg)**	< 0.30				1	--	--
Mineral Oil (mg/kg) EH, ID, CU, AL	< 10				500	--	--
Total PAH (WAC-17) (mg/kg)	11.3				100	--	--
pH (units)**	8.4				--	>6	--
Acid Neutralisation Capacity (mmol / kg)	4.5				--	To be evaluated	To be evaluated
Eluate Analysis							
(BS EN 12457 - 3 preparation utilising end over end leaching procedure)	2:1	8:1		Cumulative 10:1	Limit values for compliance leaching test		
	mg/l	mg/l		mg/kg	using BS EN 12457-3 at L/S 10 l/kg (mg/kg)		
Arsenic *	< 0.010	< 0.010		0.051	0.5	2	25
Barium *	0.025	0.0097		0.11	20	100	300
Cadmium *	< 0.0005	< 0.0005		< 0.0020	0.04	1	5
Chromium *	0.0012	< 0.0010		0.0056	0.5	10	70
Copper *	0.025	0.0092		0.10	2	50	100
Mercury *	< 0.0015	< 0.0015		< 0.010	0.01	0.2	2
Molybdenum *	< 0.0030	< 0.0030		< 0.020	0.5	10	30
Nickel *	0.0019	< 0.0010		0.0069	0.4	10	40
Lead *	< 0.0050	< 0.0050		< 0.020	0.5	10	50
Antimony *	< 0.0050	< 0.0050		< 0.020	0.06	0.7	5
Selenium *	< 0.010	< 0.010		< 0.040	0.1	0.5	7
Zinc *	0.010	0.0037		0.041	4	50	200
Chloride *	< 4.0	< 4.0		< 15	800	15000	25000
Fluoride*	0.36	0.27		2.8	10	150	500
Sulphate *	1.8	0.61		7.0	1000	20000	50000
TDS*	120	59		630	4000	60000	100000
Phenol Index (Monohydric Phenols) *	< 0.13	< 0.13		< 0.50	1	-	-
DOC	16	8.2		88	500	800	1000
Leach Test Information							
Stone Content (%)	< 0.1						
Sample Mass (kg)	1.3						
Dry Matter (%)	90						
Moisture (%)	10						
Stage 1							
Volume Eluate L2 (litres)	0.32						
Filtered Eluate VE1 (litres)	0.13						
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.

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Waste Acceptance Criteria Analytical Results							
Report No:	24-79501						
					Client: LUSTRECONS		
Location	Atterbury Gardens Reading						
Lab Reference (Sample Number)	2935241				Landfill Waste Acceptance Criteria		
					Limits		
Sampling Date	18/01/2024				Inert Waste Landfill	Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill	Hazardous Waste Landfill
Sample ID	WS01						
Depth (m)	1.40						
Solid Waste Analysis							
TOC (%)**	0.5				3%	5%	6%
Loss on Ignition (%) **	1.9				--	--	10%
BTEX (µg/kg)**	< 10				6000	--	--
Sum of PCBs (mg/kg)**	< 0.30				1	--	--
Mineral Oil (mg/kg) EH_ID_CU_AL	< 10				500	--	--
Total PAH (WAC-17) (mg/kg)	11.3				100	--	--
pH (units)**	8.3				--	>6	--
Acid Neutralisation Capacity (mmol / kg)	7.1				--	To be evaluated	To be evaluated
Eluate Analysis							
(BS EN 12457 - 3 preparation utilising end over end leaching procedure)	2:1	8:1		Cumulative 10:1	Limit values for compliance leaching test		
	mg/l	mg/l		mg/kg	using BS EN 12457-3 at L/S 10 l/kg (mg/kg)		
Arsenic *	< 0.010	< 0.010		< 0.050	0.5	2	25
Barium *	0.017	0.0057		0.067	20	100	300
Cadmium *	< 0.0005	< 0.0005		< 0.0020	0.04	1	5
Chromium *	< 0.0010	< 0.0010		< 0.0050	0.5	10	70
Copper *	0.0090	0.0042		0.046	2	50	100
Mercury *	< 0.0015	< 0.0015		< 0.010	0.01	0.2	2
Molybdenum *	0.0037	< 0.0030		0.027	0.5	10	30
Nickel *	< 0.0010	< 0.0010		< 0.0050	0.4	10	40
Lead *	< 0.0050	< 0.0050		< 0.020	0.5	10	50
Antimony *	< 0.0050	< 0.0050		< 0.020	0.06	0.7	5
Selenium *	< 0.010	< 0.010		< 0.040	0.1	0.5	7
Zinc *	0.0079	0.0034		0.038	4	50	200
Chloride *	< 4.0	< 4.0		< 15	800	15000	25000
Fluoride*	0.35	0.30		3.1	10	150	500
Sulphate *	1.9	0.68		7.8	1000	20000	50000
TDS*	100	52		560	4000	60000	100000
Phenol Index (Monohydric Phenols) *	< 0.13	< 0.13		< 0.50	1	-	-
DOC	11	8.3		85	500	800	1000
Leach Test Information							
Stone Content (%)	< 0.1						
Sample Mass (kg)	1.6						
Dry Matter (%)	91						
Moisture (%)	8.9						
Stage 1							
Volume Eluate L2 (litres)	0.32						
Filtered Eluate VE1 (litres)	0.15						
Results are expressed on a dry weight basis, after correction for moisture content where applicable.							
Stated limits are for guidance only and i2 cannot be held responsible for any discrepancies with current legislation							
** = MCERTS accredited							
* = UKAS accredited (liquid eluate analysis only)							

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.

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Waste Acceptance Criteria Analytical Results

Waste Acceptance Criteria Analytical Results							
Report No:	24-79501						
					Client: LUSTRECONS		
Location	Atterbury Gardens Reading						
Lab Reference (Sample Number)	2935242				Landfill Waste Acceptance Criteria		
					Limits		
Sampling Date	18/01/2024				Inert Waste Landfill	Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill	Hazardous Waste Landfill
Sample ID	WS02						
Depth (m)	1.00						
Solid Waste Analysis							
TOC (%)**	0.7				3%	5%	6%
Loss on Ignition (%) **	3.3				--	--	10%
BTEX (µg/kg)**	< 10				6000	--	--
Sum of PCBs (mg/kg)**	< 0.30				1	--	--
Mineral Oil (mg/kg) EH-ID,CU,AL	42				500	--	--
Total PAH (WAC-17) (mg/kg)	4.52				100	--	--
pH (units)**	7.9				--	>6	--
Acid Neutralisation Capacity (mmol / kg)	2.9				--	To be evaluated	To be evaluated
Eluate Analysis							
(BS EN 12457 - 3 preparation utilising end over end leaching procedure)	2:1	8:1		Cumulative 10:1	Limit values for compliance leaching test		
					using BS EN 12457-3 at L/S 10 l/kg (mg/kg)		
	mg/l	mg/l		mg/kg			
Arsenic *	< 0.010	< 0.010		< 0.050	0.5	2	25
Barium *	0.031	0.021		0.22	20	100	300
Cadmium *	< 0.0005	< 0.0005		< 0.0020	0.04	1	5
Chromium *	0.0036	0.0014		0.017	0.5	10	70
Copper *	0.012	0.0056		0.062	2	50	100
Mercury *	< 0.0015	< 0.0015		< 0.010	0.01	0.2	2
Molybdenum *	0.0084	0.0040		0.045	0.5	10	30
Nickel *	0.0011	< 0.0010		0.0058	0.4	10	40
Lead *	< 0.0050	< 0.0050		< 0.020	0.5	10	50
Antimony *	< 0.0050	< 0.0050		< 0.020	0.06	0.7	5
Selenium *	< 0.010	< 0.010		< 0.040	0.1	0.5	7
Zinc *	0.0097	0.0031		0.038	4	50	200
Chloride *	< 4.0	< 4.0		< 15	800	15000	25000
Fluoride*	0.63	0.46		4.7	10	150	500
Sulphate *	8.9	3.4		40	1000	20000	50000
TDS*	95	53		570	4000	60000	100000
Phenol Index (Monohydric Phenols) *	< 0.13	< 0.13		< 0.50	1	-	-
DOC	9.9	8.2		84	500	800	1000
Leach Test Information							
Stone Content (%)	52						
Sample Mass (kg)	1.7						
Dry Matter (%)	90						
Moisture (%)	10						
Stage 1							
Volume Eluate L2 (litres)	0.32						
Filtered Eluate VE1 (litres)	0.18						
Results are expressed on a dry weight basis, after correction for moisture content where applicable.							
Stated limits are for guidance only and i2 cannot be held responsible for any discrepancies with current legislation							
** = MCERTS accredited							
* = UKAS accredited (liquid eluate analysis only)							

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 : 24-79501
Project / Site name: Atterbury Gardens Reading

* 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 *
2935240	WS01	None Supplied	0.3	Brown loam and sand with gravel and vegetation.
2935241	WS01	None Supplied	1.4	Brown clay and sand with gravel and chalk.
2935242	WS02	None Supplied	1	Brown loam and sand with gravel and brick.

Analytical Report Number : 24-79501

Project / Site name: Atterbury Gardens Reading

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
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
Preparation WAC leachate		In-house method	L043-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.	L064-PL	D	MCERTS
Chloride in WAC leachate (BS EN 12457-3 Prep)	Determination of Chloride colorimetrically by discrete analyser.	In house based on MEWAM Method ISBN 0117516260.	L082-PL	W	ISO 17025
Fluoride in WAC leachate (BS EN 12457-3 Prep)	Determination of fluoride in leachate by 1:1ratio with a buffer solution followed by Ion Selective Electrode.	In-house method based on Standard Methods for the Examination of Water and Waste Water, 21st Ed.	L033-PL	W	ISO 17025
Phenol Index in WAC leachate (BS EN 12457-3 Prep)	Determination of monohydric phenols in leachate by continuous flow analyser.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	ISO 17025
Sulphate in WAC leachate (BS EN 12457-3 Prep)	Determination of sulphate in leachate by acidification followed by ICP-OES.	In-house method based on Standard Methods for the Examination of Water and Waste Water, 21st Ed.	L039-PL	W	ISO 17025
TDS in WAC leachate (BS EN 12457-3 Prep)	Determination of total dissolved solids in leachate by electrometric measurement.	In-house method based on Standard Methods for the Examination of Water and Waste Water, 21st Ed.	L031-PL	W	ISO 17025
DOC in WAC leachate (BS EN 12457-3 Prep)	Determination of dissolved organic carbon in leachate by TOC/DOC NDIR analyser.	In-house method based on Standard Methods for the Examination of Water and Waste Water, 21st Ed.	L037-PL	W	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	NONE
BTEX (Sum of BTEX compounds) in soil	Determination of BTEX in soil by headspace GC-MS. Individual components MCERTS accredited	In-house method based on USEPA8260. Refer to CoA for analyte specific accreditation	L073B-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 in Soil C10 - C40	Determination of mineral oil fraction extractable hydrocarbons in soil by GC-FID.	In-house method with silica gel split/clean up.	L076-PL	D	NONE
pH in soil	Determination of pH in soil by addition of water followed by electrometric measurement.	In house method.	L005-PL	W	MCERTS

Analytical Report Number : 24-79501

Project / Site name: Atterbury Gardens Reading

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
Total organic carbon in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L023-PL	D	MCERTS
Metals in WAC leachate (BS EN 12457-3 Prep)	Determination of metals in leachate by acidification followed by ICP-OES.	In-house method based on Standard Methods for the Examination of Water and Waste Water, 21st Ed.	L039-PL	W	ISO 17025

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

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

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

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

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

APPENDIX D: Field Monitoring Records

RND 1	Project No.:	4904	Date:	01/02/2024	Weather:	Clear skies
	Project Name:	Atterbury Gardens	Initials:	TH & ME	24 hr Pressure:	1025mb



NOTES: Gas concentrations and PID headspace is monitored for a minimum of 160 seconds. If concentrations remains variable then monitoring continued to a maximum of 300 seconds.

COMMENTS	
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RND 2	Project No.:	4904	Date:	07/02/2024	Weather:	Overcast
	Project Name:	Atterbury Gardens - Reading	Initials:	TH	24 hr Pressure:	996mb



NOTES: Gas concentrations and PID headspace is monitored for a minimum of 160 seconds. If concentrations remains variable then monitoring continued to a maximum of 300 seconds.

COMMENTS	
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RND 3	Project No.:	4904	Date:	14/02/2024	Weather:	Overcast
	Project Name:	Atterbury Gardens - Reading	Initials:	TH	24 hr Pressure:	1003mb

[illegible]

NOTES: Flow is recorded for a minimum of 60 seconds. If flow remains variable then monitoring continued to a maximum of 120 seconds.

NOTES: Gas concentrations and PID headspace is monitored for a minimum of 160 seconds. If concentrations remains variable then monitoring continued to a maximum of 300 seconds.

COMMENTS	
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RND 4	Project No.:	4904	Date:	22/02/2024	Weather:	Overcast, rainy
	Project Name:	Atterbury Gardens - Reading	Initials:	TH	24 hr Pressure:	968mb



NOTES: Gas concentrations and PID headspace is monitored for a minimum of 160 seconds. If concentrations remains variable then monitoring continued to a maximum of 300 seconds.

COMMENTS	
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RND 5	Project No.:	4904	Date:	29/02/2024	Weather:	Overcast
	Project Name:	Atterbury Gardens - Reading	Initials:	TH	24 hr Pressure:	994mb

[illegible]

NOTES: Flow is recorded for a minimum of 60 seconds. If flow remains variable then monitoring continued to a maximum of 120 seconds.

NOTES: Gas concentrations and PID headspace is monitored for a minimum of 160 seconds. If concentrations remains variable then monitoring continued to a maximum of 300 seconds.

COMMENTS	
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RND 6	Project No.:	4904	Date:	07/03/2024	Weather:	Overcast
	Project Name:	Atterbury Gardens - Reading	Initials:	TH	24 hr Pressure:	1010mb



NOTES: Gas concentrations and PID headspace is monitored for a minimum of 160 seconds. If concentrations remains variable then monitoring continued to a maximum of 300 seconds.

COMMENTS	
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APPENDIX E: Assessment Tables

GROUND GAS SUMMARY

4904

Atterbury Gardens - Reading



TABLE SHOWING SUMMARY MONITORING DATA

MONITORING ID	MAXIMUM FLOW (l/hr)	MAXIMUM METHANE (% v/v)	MAXIMUM CO2 (% v/v)	MINIMUM O2 (% v/v)	MAXIMUM PID	NO. OF ROUNDS MONITORED
WS01	0	0	3.8	15.1	0	6
WS02	0	0	4.2	14.6	0.9	6
WS03	0	0	2.1	16.9	0	6
WS04	0	0	1.9	18.1	0	6
MAXIMUM*	0	0	4.2	14.6	0.9	6

* Reported value for oxygen in minimum.

TABLE SHOWING GROUND GAS ASSESSMENT PER ROUND

ROUND NO.	MAX FLOW	METHANE GSV	CO2 GSV	CHARACTERISTIC SITUATION	NHBC CLASSIFICATION	> ADVISORY THRESHOLD
1	0.1	0.0001	0.0023	1	Green	NO
2	0.1	0.0001	0.0027	1	Green	NO
3	0.1	0.0001	0.0026	1	Green	NO
4	0.1	0.0001	0.0038	1	Green	NO
5	0.1	0.0001	0.0032	1	Green	NO
6	0.1	0.0001	0.0042	1	Green	NO

TABLE SHOWING OVERALL GROUND GAS ASSESSMENT

GAS SCREENING VALUE (GSV)		METHANE	CO2	RECOMMENDATION		
		0	0.0042			
MODIFIED WILSON & CARD	CHARACTERISTIC SITUATION	1	1	Negligible gas regime identified and gas protection measures not considered necessary.		
	COMBINED:	1				
NHBC - LOW RISE RESIDENTIAL	CLASSIFICATION	Green	Green	No special precautions required.		
	COMBINED:	Green				
Advisory Threshold Exceeded?		METHANE	NO	CO2	NO	No additional recommendation

HUMAN HEALTH QUANTITATIVE RISK ASSESSMENT - SOILS
MADE GROUND
4904
Atterbury Gardens - Reading



Assessment Scenario:
Assessment Criteria Source:
Soil Organic Matter (%):

Residential with homegrown produce
SGVs, GACs, S4ULs & C4SLs
SOM = 1%

DETERMINAND	UNITS	MINIMUM	AVERAGE	MAXIMUM	No. of TESTS	Sample Ref		2935233	2935234	2935235	2935236	2935237	2935238	2935239
						ASSESSMENT	No. >	WS01	WS01	WS02	WS02	WS03	WS04	WS04
						CRITERIA	AC	0.3	1.4	1	2.5	0.5	0.2	0.7
Asbestos in Soil	N/A	N/A	N/A	N/A	7	Detected	1	Not-detected	Not-detected	Not-detected	Detected	Not-detected	Not-detected	Not-detected
pH - Automated	no units	7.80	8.30	9.30	7	No Criteria	0	7.8	8	9.3	8.4	8.2	8.1	8.3
Total Cyanide	mg/kg	<LOD	1.00	1.00	7	53.00	0	<LOD	<LOD	<LOD	1	<LOD	<LOD	<LOD
Arsenic	mg/kg	14.00	19.14	27.00	7	37.00	0	14	16	21	27	18	21	17
Cadmium	mg/kg	<LOD	1.65	5.70	7	26.00	0	<LOD	<LOD	5.7	4.6	<LOD	<LOD	<LOD
Chromium	mg/kg	26.00	106.71	180.00	7	910.00	0	120	180	150	61	120	26	90
Copper	mg/kg	15.00	99.57	470.00	7	2400.00	0	22	16	130	470	15	27	17
Lead	mg/kg	38.00	240.57	600.00	7	200.00	3	66	38	390	600	170	290	130
Mercury	mg/kg	<LOD	2.26	6.80	7	170.00	0	<LOD	0.3	6.8	6.7	<LOD	<LOD	<LOD
Nickel	mg/kg	19.00	24.43	38.00	7	130.00	0	19	20	29	38	22	23	20
Selenium	mg/kg	<LOD	<LOD	<LOD	7	250.00	0	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD
Zinc	mg/kg	59.00	187.14	540.00	7	3700.00	0	110	59	230	540	61	200	110
Naphthalene	mg/kg	<LOD	0.09	0.16	7	2.30	0	<LOD	0.16	0.08	0.11	0.05	0.11	0.05
Acenaphthylene	mg/kg	<LOD	0.08	0.12	7	170.00	0	0.07	0.11	<LOD	0.12	0.09	0.08	0.06
Acenaphthene	mg/kg	<LOD	0.05	0.06	7	210.00	0	<LOD	0.06	<LOD	0.05	<LOD	<LOD	<LOD
Fluorene	mg/kg	<LOD	0.05	0.05	7	170.00	0	<LOD	0.05	<LOD	<LOD	<LOD	<LOD	<LOD
Phenanthrene	mg/kg	0.28	0.49	0.73	7	95.00	0	0.49	0.67	0.32	0.73	0.51	0.41	0.28
Anthracene	mg/kg	0.06	0.12	0.21	7	2400.00	0	0.12	0.17	0.07	0.21	0.12	0.09	0.06
Fluoranthene	mg/kg	0.74	1.40	2.10	7	280.00	0	1.7	1.7	0.74	2.1	1.4	1.2	0.96
Pyrene	mg/kg	0.67	1.25	1.80	7	620.00	0	1.7	1.4	0.67	1.8	1.2	1.1	0.86
Benzo(a)anthracene	mg/kg	0.39	0.75	1.00	7	7.20	0	0.99	0.96	0.39	1	0.76	0.61	0.53
Chrysene	mg/kg	0.38	0.84	1.20	7	15.00	0	1.1	1.1	0.38	1.2	0.83	0.73	0.57
Benzo(b)fluoranthene	mg/kg	0.60	1.09	1.50	7	2.60	0	1.4	1.4	0.6	1.5	1.1	0.9	0.75
Benzo(k)fluoranthene	mg/kg	0.18	0.46	0.67	7	77.00	0	0.63	0.65	0.18	0.67	0.46	0.39	0.23
Benzo(a)pyrene	mg/kg	0.47	0.97	1.30	7	5.00	0	1.3	1.2	0.47	1.3	0.99	0.82	0.68
Indeno(1,2,3-cd)pyrene	mg/kg	0.29	0.59	0.82	7	27.00	0	0.74	0.76	0.29	0.82	0.6	0.48	0.42
Dibenz(a,h)anthracene	mg/kg	<LOD	0.11	0.17	7	0.24	0	0.15	0.17	<LOD	0.14	0.13	0.09	<LOD
Benzo(ghi)perylene	mg/kg	0.33	0.65	0.91	7	320.00	0	0.85	0.78	0.33	0.91	0.67	0.56	0.42
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	<LOD	<LOD	<LOD	7	42.00	0	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	<LOD	<LOD	<LOD	7	100.00	0	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	<LOD	<LOD	<LOD	7	27.00	0	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	<LOD	<LOD	<LOD	7	130.00	0	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	<LOD	<LOD	<LOD	7	1100.00	0	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	<LOD	<LOD	<LOD	7	32500.00	0	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	<LOD	7.43	34.00	7	32500.00	0	<LOD	<LOD	34	<LOD	<LOD	<LOD	<LOD
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	<LOD	<LOD	<LOD	7	70.00	0	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	<LOD	<LOD	<LOD	7	130.00	0	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	<LOD	<LOD	<LOD	7	34.00	0	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	<LOD	<LOD	<LOD	7	74.00	0	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	<LOD	<LOD	<LOD	7	140.00	0	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	<LOD	2.00	11.00	7	260.00	0	<LOD	11	<LOD	<LOD	<LOD	<LOD	<LOD
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	<LOD	8.00	17.00	7	1100.00	0	17	14	<LOD	13	<LOD	<LOD	<LOD
Benzene	mg/kg	<LOD	<LOD	<LOD	7	0.87	0	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD
Toluene	mg/kg	<LOD	<LOD	<LOD	7	130.00	0	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD
Ethylbenzene	mg/kg	<LOD	<LOD	<LOD	7	47.00	0	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD
p & m-xylene	mg/kg	<LOD	<LOD	<LOD	7	56.00	0	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD
o-Xylene	mg/kg	<LOD	<LOD	<LOD	7	60.00	0	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD
Total Phenols (monohydric)	mg/kg	<LOD	<LOD	<LOD	7	120.00	0	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD
MTBE (Methyl Tertiary Butyl Ether)	mg/kg	<LOD	<LOD	<LOD	7	49.00	0	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.01	0.03	0.09	7	No Criteria	0	0.0061	0.0093	0.0901	0.0387	0.012	0.0154	0.0442

PHYTOTOXICITY RISK ASSESSMENT

4904

Atterbury Gardens - Reading

Risk Criteria: British Standard BS

3882:2007 (Specification for
topsoil and requirements for use)**TABLE SHOWING PHYTOTOXICITY ASSESSMENT FOR MADE GROUND**

DETERMINAND	UNITS	MINIMUM	AVERAGE	MAXIMUM	No. of TESTS	ASSESSMENT CRITERIA	No. > AC	DETAILS
Copper	mg/kg	15.00	99.57	470.00	7	200.00	1	WS02 (2.5 m bgl) at 470mg/kg
Nickel	mg/kg	19.00	-	38.00	7	110.00	0	-
Zinc	mg/kg	59.00	187.14	540.00	7	300.00	1	WS02 (2.5 m bgl) at 540mg/kg

TABLE SHOWING PHYTOTOXICITY ASSESSMENT FOR NATURAL GROUND

DETERMINAND	UNITS	MINIMUM	AVERAGE	MAXIMUM	No. of TESTS	ASSESSMENT CRITERIA	No. > AC	DETAILS
Copper	mg/kg	0.00	-	<LOD	0	200.00	0	-
Nickel	mg/kg	0.00	-	<LOD	0	110.00	0	-
Zinc	mg/kg	0.00	-	<LOD	0	300.00	0	-

POTABLE WATER PIPELINE RISK ASSESSMENT

4904

Atterbury Gardens - Reading



TABLE SHOWING WATER PIPELINE ASSESSMENT

DETERMINAND	UNITS	THRESHOLD		THRESHOLD		MAXIMUM CONCENTRATION
		PE	EXCEEDED	PVC	EXCEEDED	
GROUP 1						
Total VOC (with TICs)*	µg/kg	500.00	NO	125.00	NO	<LOD
BTEX & MTBE	µg/kg	100.00	NO	30.00	NO	<LOD
GROUP 2						
**Total SVOC Suite (with TIC)	mg/kg	2.00	NO	1.40	NO	
Phenols	mg/kg	2.00	NO	0.40	NO	
Cresols & Chlorinated Phenols	mg/kg	2.00	NO	0.04	NO	
†Ethers	mg/kg	0.50	-	1.00	-	
†Nitrobenzene	mg/kg	0.50	-	0.40	-	
†Ketones	mg/kg	0.50	-	0.02	-	
†Aldehydes	mg/kg	0.50	-	0.02	-	
GROUP 3						
Mineral Oils (C11 to C20)	mg/kg	10.00	YES	No effect	NO	11.00
GROUP 4						
Mineral Oils (C21 to C40)	mg/kg	500.00	NO	No effect	NO	34.00
GROUP 5^						
Conductivity	µ2/cm	-	-	-	-	-
Redox Potential	mV	-	-	-	-	-
pH	-	-	-	-	-	-
GROUP 6						
†Amines	ug/kg	N/A	-	No effect	-	-

NOTES:

*Minus total concentration of BTEX + MTBE.

**Minus total concentration of phenols, cresols and chlorinated phenols.

†Only required if current or historical site use indicates they may be present.

^Only applicable when selecting suitable barrier pipe (see UKWIR Guidance document)

RISK CRITERIA:

UK Water Industry Research (UKWIR). Guidance for the Selection of Water Supply

Pipes to be used in Brownfield Sites. Ref. 10/WM/03/21. 2010

BURIED CONCRETE ASSESSMENT

4904

Atterbury Gardens - Reading

**TABLE SHOWING BURIED CONCRETE ASSESSMENT**

SOIL GROUP	DETERMINAND	UNITS	NO. OF TESTS	MIN	MAX	CHARACTERISTIC VALUE	BRE CLASSIFICATION
MADE GROUND	Total Potential Sulfate	%	-	-	-	-	DS1
	Water Soluble Sulphate as SO4	g/l	7	0.01	0.09	0.090	
	pH	-	7	7.8	9.3	7.8	AC-1s
NATURAL GROUND	Total Potential Sulfate	%	-	-	-	-	
	Water Soluble Sulphate as SO4	g/l	0	-	-	-	
	pH	-	0	-	-	-	#N/A
GROUNDWATER	Sulphate as SO4	g/l	0				
	pH	-	0				

OTHER FACTORS CONSIDERED:

Pyritic soils (Made Ground) have not been encountered or considered in this assessment.

Pyritic soils (Natural Ground) have not been encountered in this assessment.

GENERAL NOTES:

The Characteristic Value is based on lowest pH value / highest SO4.

Where the DS Class is different for soluble sulphates and total potential sulphates, the highest DS Class is adopted in accordance with BRE Special Digest 1:2005, 3rd Edition, 'Concrete in Aggressive Ground.' However, if the assessment of TPS is not appropriate (owing to low oxidisable sulphates) only the soluble sulphates have been considered.

Waste Classification Report

HazWasteOnline™ classifies waste as either **hazardous** or **non-hazardous** based on its chemical composition, related legislation and the rules and data defined in the current UK or EU technical guidance (Appendix C) (note that HP 9 Infectious is not assessed). It is the responsibility of the classifier named below to:

- understand the origin of the waste
- select the correct List of Waste code(s)
- confirm that the list of determinands, results and sampling plan are fit for purpose
- select and justify the chosen metal species (Appendix B)
- correctly apply moisture correction and other available corrections
- add the meta data for their user-defined substances (Appendix A)
- check that the classification engine is suitable with respect to the national destination of the waste (Appendix C)



3NHWW-HMVU7-BTEWT

To aid the reviewer, the laboratory results, assumptions and justifications managed by the classifier are highlighted in pale yellow.

Job name

24-79500_HWOL_Results

Description/Comments

Project

4904

Site

Atterbury Gardens, Reading

Classified by

Name:

Toby Hill

Date:

15 Feb 2024 16:14 GMT

Telephone:

01634 757 705

Company:

Lustre Consulting

Suite 1, Second Floor North,

The Fitted Rigging House,

Chatham

ME4 4TZ

HazWasteOnline™ provides a two day, hazardous waste classification course that covers the use of the software and both basic and advanced waste classification techniques. Certification has to be renewed every 3 years.

HazWasteOnline™ Certification:

CERTIFIED

Course

Hazardous Waste Classification

Date

06 Oct 2022

Next 3 year Refresher due by Oct 2025

Purpose of classification

2 - Material Characterisation

Address of the waste

Land at Attenbury Gardens, in Reading, Berkshire, RG7 5SE

Post Code RG7 5SE

SIC for the process giving rise to the waste

41202 Construction of domestic buildings

Description of industry/producer giving rise to the waste

Redevelopment of vacant land (now infilled gravel pit)

Description of the specific process, sub-process and/or activity that created the waste

Arising generated during excavations for foundations as well as landscaping.

Description of the waste

Made Ground comprising brown sandy gravelly CLAYs with brick, concrete, wood tile, glass, flint and Chalk arisings



Job summary

#	Sample name	Depth [m]	Classification Result	Hazard properties	Page
1	WS01---0.30		Non Hazardous		3
2	WS01---1.40		Non Hazardous		6
3	WS02---1.00		Non Hazardous		9
4	WS02---2.50		Non Hazardous		12
5	WS03---0.50		Non Hazardous		15
6	WS04---0.20		Non Hazardous		18
7	WS04---0.70		Non Hazardous		20

Related documents

#	Name	Description
1	24-79500_HWOL_Results.hwol	i2 Analytical .hwol file used to populate the Job
2	Contaminated Soils including Acid / Alkali Reserve	waste stream template used to create this Job

Report

Created by: Toby Hill

Created date: 15 Feb 2024 16:14 GMT

Appendices	Page
Appendix A: Classifier defined and non GB MCL determinands	22
Appendix B: Rationale for selection of metal species	23
Appendix C: Version	24

Classification of sample: WS01---0.30

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
WS01---0.30	Chapter:
Moisture content:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
10%	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
(wet weight correction)	Entry:

Hazard properties

None identified

Determinands

Moisture content: 10% Wet Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
1	arsenic { arsenic trioxide }				14 mg/kg	1.32	16.636	mg/kg	0.00166 %	✓	
	033-003-00-0	215-481-4	1327-53-3								
2	boron { diboron trioxide }				<0.2 mg/kg	3.22	<0.644	mg/kg	<0.0000644 %		<LOD
	005-008-00-8	215-125-8	1303-86-2								
3	cadmium { cadmium oxide }				<0.2 mg/kg	1.142	<0.228	mg/kg	<0.0000228 %		<LOD
	048-002-00-0	215-146-2	1306-19-0								
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				120 mg/kg	1.462	157.848	mg/kg	0.0158 %	✓	
		215-160-9	1308-38-9								
5	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<1.8 mg/kg	2.27	<4.086	mg/kg	<0.000409 %		<LOD
	024-017-00-8										
6	copper { dicopper oxide; copper (I) oxide }				22 mg/kg	1.126	22.293	mg/kg	0.00223 %	✓	
	029-002-00-X	215-270-7	1317-39-1								
7	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	66 mg/kg		59.4	mg/kg	0.00594 %	✓	
	082-001-00-6										
8	mercury { mercury dichloride }				<0.3 mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<LOD
	080-010-00-X	231-299-8	7487-94-7								
9	nickel { dinickel hexacyanoferrate }				19 mg/kg	2.806	47.975	mg/kg	0.0048 %	✓	
	028-037-00-8	238-946-3	14874-78-3								
10	selenium { nickel selenate }				<1 mg/kg	2.554	<2.554	mg/kg	<0.000255 %		<LOD
	028-031-00-5	239-125-2	15060-62-5								
11	zinc { zinc sulphate (hydrous) (mono-, hexa- and hepta hydrate); [1] zinc sulphate (anhydrous) [2] }				110 mg/kg	4.398	435.395	mg/kg	0.0435 %	✓	
	030-006-00-9	231-793-3 [1]	7446-19-7 [1]								
		231-793-3 [2]	7733-02-0 [2]								
12	TPH (C6 to C40) petroleum group				24 mg/kg		21.6	mg/kg	0.00216 %	✓	
			TPH								
13	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.005 mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
	603-181-00-X	216-653-1	1634-04-4								
14	benzene				<0.005 mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
	601-020-00-8	200-753-7	71-43-2								



#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
15	toluene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	601-021-00-3	203-625-9	108-88-3							
16	ethylbenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	601-023-00-4	202-849-4	100-41-4							
17	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]							
18	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<1 mg/kg	1.884	<1.884 mg/kg	<0.000188 %		<LOD
	006-007-00-5									
19	pH				7.8 pH		7.8 pH	7.8 pH		
			PH							
20	naphthalene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
	601-052-00-2	202-049-5	91-20-3							
21	acenaphthylene				0.07 mg/kg		0.063 mg/kg	0.0000063 %	✓	
		205-917-1	208-96-8							
22	acenaphthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
		201-469-6	83-32-9							
23	fluorene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
		201-695-5	86-73-7							
24	phenanthrene				0.49 mg/kg		0.441 mg/kg	0.0000441 %	✓	
		201-581-5	85-01-8							
25	anthracene				0.12 mg/kg		0.108 mg/kg	0.0000108 %	✓	
		204-371-1	120-12-7							
26	fluoranthene				1.7 mg/kg		1.53 mg/kg	0.000153 %	✓	
		205-912-4	206-44-0							
27	pyrene				1.7 mg/kg		1.53 mg/kg	0.000153 %	✓	
		204-927-3	129-00-0							
28	benzo[a]anthracene				0.99 mg/kg		0.891 mg/kg	0.0000891 %	✓	
	601-033-00-9	200-280-6	56-55-3							
29	chrysene				1.1 mg/kg		0.99 mg/kg	0.000099 %	✓	
	601-048-00-0	205-923-4	218-01-9							
30	benzo[b]fluoranthene				1.4 mg/kg		1.26 mg/kg	0.000126 %	✓	
	601-034-00-4	205-911-9	205-99-2							
31	benzo[k]fluoranthene				0.63 mg/kg		0.567 mg/kg	0.0000567 %	✓	
	601-036-00-5	205-916-6	207-08-9							
32	benzo[a]pyrene; benzo[def]chrysene				1.3 mg/kg		1.17 mg/kg	0.000117 %	✓	
	601-032-00-3	200-028-5	50-32-8							
33	indeno[123-cd]pyrene				0.74 mg/kg		0.666 mg/kg	0.0000666 %	✓	
		205-893-2	193-39-5							
34	dibenz[a,h]anthracene				0.15 mg/kg		0.135 mg/kg	0.0000135 %	✓	
	601-041-00-2	200-181-8	53-70-3							
35	benzo[ghi]perylene				0.85 mg/kg		0.765 mg/kg	0.0000765 %	✓	
		205-883-8	191-24-2							
36	monohydric phenols				<1 mg/kg		<1 mg/kg	<0.0001 %		<LOD
			P1186							
Total:								0.0782 %		

Key	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
•	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and ≤ 75°C"

Force this Hazardous property to non hazardous because Flammable has been discounted as a viable Hazardous Property as the soils considered within this assessment are a solid waste without a free draining liquid phase. Advice from the laboratory indicates that testing for flammability was not appropriate due to the low level of TPH. The waste does not display this hazardous property.

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.00216%)



Classification of sample: WS01---1.40



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

Sample details

Sample name:	LoW Code:
WS01---1.40	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
8.9% (wet weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 8.9% Wet Weight Moisture Correction applied (MC)

#		Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number								
1		arsenic { arsenic trioxide }				16 mg/kg	1.32	19.245 mg/kg	0.00192 %	✓		
		033-003-00-0	215-481-4	1327-53-3								
2		boron { diboron trioxide }				0.5 mg/kg	3.22	1.467 mg/kg	0.000147 %	✓		
		005-008-00-8	215-125-8	1303-86-2								
3		cadmium { cadmium oxide }				<0.2 mg/kg	1.142	<0.228 mg/kg	<0.0000228 %		<LOD	
		048-002-00-0	215-146-2	1306-19-0								
4		chromium in chromium(III) compounds {  chromium(III) oxide (worst case) }				180 mg/kg	1.462	239.666 mg/kg	0.024 %	✓		
			215-160-9	1308-38-9								
5		chromium in chromium(VI) compounds { chromium(VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<1.8 mg/kg	2.27	<4.086 mg/kg	<0.000409 %		<LOD	
		024-017-00-8										
6		copper { dicopper oxide; copper (I) oxide }				16 mg/kg	1.126	16.411 mg/kg	0.00164 %	✓		
		029-002-00-X	215-270-7	1317-39-1								
7		lead {  lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	38 mg/kg		34.618 mg/kg	0.00346 %	✓		
		082-001-00-6										
8		mercury { mercury dichloride }				0.3 mg/kg	1.353	0.37 mg/kg	0.000037 %	✓		
		080-010-00-X	231-299-8	7487-94-7								
9		nickel { dinickel hexacyanoferrate }				20 mg/kg	2.806	51.117 mg/kg	0.00511 %	✓		
		028-037-00-8	238-946-3	14874-78-3								
10		selenium { nickel selenate }				<1 mg/kg	2.554	<2.554 mg/kg	<0.000255 %		<LOD	
		028-031-00-5	239-125-2	15060-62-5								
11		zinc { zinc sulphate (hydrous) (mono-, hexa- and hepta hydrate); [1] zinc sulphate (anhydrous) [2] }				59 mg/kg	4.398	236.384 mg/kg	0.0236 %	✓		
		030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]								
12		TPH (C6 to C40) petroleum group				25 mg/kg		22.775 mg/kg	0.00228 %	✓		
				TPH								
13		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD	
		603-181-00-X	216-653-1	1634-04-4								
14		benzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD	
		601-020-00-8	200-753-7	71-43-2								



#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
15	toluene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-021-00-3	203-625-9	108-88-3								
16	ethylbenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-023-00-4	202-849-4	100-41-4								
17	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]								
18	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<1 mg/kg	1.884	<1.884 mg/kg	<0.000188 %			<LOD
	006-007-00-5										
19	pH				8 pH		8 pH	8pH			
			PH								
20	naphthalene				0.16 mg/kg		0.146 mg/kg	0.0000146 %		✓	
	601-052-00-2	202-049-5	91-20-3								
21	acenaphthylene				0.11 mg/kg		0.1 mg/kg	0.00001 %		✓	
		205-917-1	208-96-8								
22	acenaphthene				0.06 mg/kg		0.0547 mg/kg	0.00000547 %		✓	
		201-469-6	83-32-9								
23	fluorene				0.05 mg/kg		0.0455 mg/kg	0.00000456 %		✓	
		201-695-5	86-73-7								
24	phenanthrene				0.67 mg/kg		0.61 mg/kg	0.000061 %		✓	
		201-581-5	85-01-8								
25	anthracene				0.17 mg/kg		0.155 mg/kg	0.0000155 %		✓	
		204-371-1	120-12-7								
26	fluoranthene				1.7 mg/kg		1.549 mg/kg	0.000155 %		✓	
		205-912-4	206-44-0								
27	pyrene				1.4 mg/kg		1.275 mg/kg	0.000128 %		✓	
		204-927-3	129-00-0								
28	benzo[a]anthracene				0.96 mg/kg		0.875 mg/kg	0.0000875 %		✓	
	601-033-00-9	200-280-6	56-55-3								
29	chrysene				1.1 mg/kg		1.002 mg/kg	0.0001 %		✓	
	601-048-00-0	205-923-4	218-01-9								
30	benzo[b]fluoranthene				1.4 mg/kg		1.275 mg/kg	0.000128 %		✓	
	601-034-00-4	205-911-9	205-99-2								
31	benzo[k]fluoranthene				0.65 mg/kg		0.592 mg/kg	0.0000592 %		✓	
	601-036-00-5	205-916-6	207-08-9								
32	benzo[a]pyrene; benzo[def]chrysene				1.2 mg/kg		1.093 mg/kg	0.000109 %		✓	
	601-032-00-3	200-028-5	50-32-8								
33	indeno[123-cd]pyrene				0.76 mg/kg		0.692 mg/kg	0.0000692 %		✓	
		205-893-2	193-39-5								
34	dibenz[a,h]anthracene				0.17 mg/kg		0.155 mg/kg	0.0000155 %		✓	
	601-041-00-2	200-181-8	53-70-3								
35	benzo[ghi]perylene				0.78 mg/kg		0.711 mg/kg	0.0000711 %		✓	
		205-883-8	191-24-2								
36	monohydric phenols				<1 mg/kg		<1 mg/kg	<0.0001 %			<LOD
			P1186								
Total:									0.0642 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
•	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification



Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and ≤ 75°C"

Force this Hazardous property to non hazardous because Flammable has been discounted as a viable Hazardous Property as the soils considered within this assessment are a solid waste without a free draining liquid phase. Advice from the laboratory indicates that testing for flammability was not appropriate due to the low level of TPH. The waste does not display this hazardous property.

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.00228%)

Classification of sample: WS02---1.00

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
WS02---1.00	Chapter:
Moisture content:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
10%	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
(wet weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 10% Wet Weight Moisture Correction applied (MC)

#		Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number								
1		arsenic { arsenic trioxide }				21 mg/kg	1.32	24.954 mg/kg	0.0025 %	✓		
		033-003-00-0	215-481-4	1327-53-3								
2		boron { diboron trioxide }				0.4 mg/kg	3.22	1.159 mg/kg	0.000116 %	✓		
		005-008-00-8	215-125-8	1303-86-2								
3		cadmium { cadmium oxide }				5.7 mg/kg	1.142	5.86 mg/kg	0.000586 %	✓		
		048-002-00-0	215-146-2	1306-19-0								
4		chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				150 mg/kg	1.462	197.31 mg/kg	0.0197 %	✓		
			215-160-9	1308-38-9								
5		chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<1.8 mg/kg	2.27	<4.086 mg/kg	<0.000409 %		<LOD	
		024-017-00-8										
6		copper { dicopper oxide; copper (I) oxide }				130 mg/kg	1.126	131.729 mg/kg	0.0132 %	✓		
		029-002-00-X	215-270-7	1317-39-1								
7		lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	390 mg/kg		351 mg/kg	0.0351 %	✓		
		082-001-00-6										
8		mercury { mercury dichloride }				6.8 mg/kg	1.353	8.283 mg/kg	0.000828 %	✓		
		080-010-00-X	231-299-8	7487-94-7								
9		nickel { dinickel hexacyanoferrate }				29 mg/kg	2.806	73.225 mg/kg	0.00732 %	✓		
		028-037-00-8	238-946-3	14874-78-3								
10		selenium { nickel selenate }				<1 mg/kg	2.554	<2.554 mg/kg	<0.000255 %		<LOD	
		028-031-00-5	239-125-2	15060-62-5								
11		zinc { zinc sulphate (hydrous) (mono-, hexa- and hepta hydrate); [1] zinc sulphate (anhydrous) [2] }				230 mg/kg	4.398	910.371 mg/kg	0.091 %	✓		
		030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]								
12		TPH (C6 to C40) petroleum group				38 mg/kg		34.2 mg/kg	0.00342 %	✓		
				TPH								
13		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD	
		603-181-00-X	216-653-1	1634-04-4								
14		benzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD	
		601-020-00-8	200-753-7	71-43-2								



#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
15	toluene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	601-021-00-3	203-625-9	108-88-3							
16	ethylbenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	601-023-00-4	202-849-4	100-41-4							
17	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]							
18	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<1 mg/kg	1.884	<1.884 mg/kg	<0.000188 %		<LOD
	006-007-00-5									
19	pH		PH		9.3 pH		9.3 pH	9.3 pH		
20	naphthalene				0.08 mg/kg		0.072 mg/kg	0.0000072 %	✓	
	601-052-00-2	202-049-5	91-20-3							
21	acenaphthylene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
		205-917-1	208-96-8							
22	acenaphthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
		201-469-6	83-32-9							
23	fluorene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
		201-695-5	86-73-7							
24	phenanthrene				0.32 mg/kg		0.288 mg/kg	0.0000288 %	✓	
		201-581-5	85-01-8							
25	anthracene				0.07 mg/kg		0.063 mg/kg	0.0000063 %	✓	
		204-371-1	120-12-7							
26	fluoranthene				0.74 mg/kg		0.666 mg/kg	0.0000666 %	✓	
		205-912-4	206-44-0							
27	pyrene				0.67 mg/kg		0.603 mg/kg	0.0000603 %	✓	
		204-927-3	129-00-0							
28	benzo[a]anthracene				0.39 mg/kg		0.351 mg/kg	0.0000351 %	✓	
	601-033-00-9	200-280-6	56-55-3							
29	chrysene				0.38 mg/kg		0.342 mg/kg	0.0000342 %	✓	
	601-048-00-0	205-923-4	218-01-9							
30	benzo[b]fluoranthene				0.6 mg/kg		0.54 mg/kg	0.000054 %	✓	
	601-034-00-4	205-911-9	205-99-2							
31	benzo[k]fluoranthene				0.18 mg/kg		0.162 mg/kg	0.0000162 %	✓	
	601-036-00-5	205-916-6	207-08-9							
32	benzo[a]pyrene; benzo[def]chrysene				0.47 mg/kg		0.423 mg/kg	0.0000423 %	✓	
	601-032-00-3	200-028-5	50-32-8							
33	indeno[123-cd]pyrene				0.29 mg/kg		0.261 mg/kg	0.0000261 %	✓	
		205-893-2	193-39-5							
34	dibenz[a,h]anthracene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
	601-041-00-2	200-181-8	53-70-3							
35	benzo[ghi]perylene				0.33 mg/kg		0.297 mg/kg	0.0000297 %	✓	
		205-883-8	191-24-2							
36	monohydric phenols				<1 mg/kg		<1 mg/kg	<0.0001 %		<LOD
			P1186							
Total:								0.175 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
•	Determinand defined or amended by HazWasteOnline (see Appendix A)
•	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and ≤ 75°C"

Force this Hazardous property to non hazardous because Flammable has been discounted as a viable Hazardous Property as the soils considered within this assessment are a solid waste without a free draining liquid phase. Advice from the laboratory indicates that testing for flammability was not appropriate due to the low level of TPH. The waste does not display this hazardous property.

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.00342%)

Classification of sample: WS02---2.50

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
WS02---2.50	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
12% (wet weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 12% Wet Weight Moisture Correction applied (MC)

#		Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number								
1		arsenic { arsenic trioxide }				27 mg/kg	1.32	31.371 mg/kg	0.00314 %	✓		
		033-003-00-0	215-481-4	1327-53-3								
2		boron { diboron trioxide }				2.3 mg/kg	3.22	6.517 mg/kg	0.000652 %	✓		
		005-008-00-8	215-125-8	1303-86-2								
3		cadmium { cadmium oxide }				4.6 mg/kg	1.142	4.624 mg/kg	0.000462 %	✓		
		048-002-00-0	215-146-2	1306-19-0								
4		chromium in chromium(III) compounds {  chromium(III) oxide (worst case) }				61 mg/kg	1.462	78.456 mg/kg	0.00785 %	✓		
			215-160-9	1308-38-9								
5		chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<1.8 mg/kg	2.27	<4.086 mg/kg	<0.000409 %		<LOD	
		024-017-00-8										
6		copper { dicopper oxide; copper (I) oxide }				470 mg/kg	1.126	465.667 mg/kg	0.0466 %	✓		
		029-002-00-X	215-270-7	1317-39-1								
7		lead {  lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	600 mg/kg		528 mg/kg	0.0528 %	✓		
		082-001-00-6										
8		mercury { mercury dichloride }				6.7 mg/kg	1.353	7.98 mg/kg	0.000798 %	✓		
		080-010-00-X	231-299-8	7487-94-7								
9		nickel { dinickel hexacyanoferrate }				38 mg/kg	2.806	93.818 mg/kg	0.00938 %	✓		
		028-037-00-8	238-946-3	14874-78-3								
10		selenium { nickel selenate }				<1 mg/kg	2.554	<2.554 mg/kg	<0.000255 %		<LOD	
		028-031-00-5	239-125-2	15060-62-5								
11		zinc { zinc sulphate (hydrous) (mono-, hexa- and hepta hydrate); [1] zinc sulphate (anhydrous) [2] }				540 mg/kg	4.398	2089.894 mg/kg	0.209 %	✓		
		030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]								
12		TPH (C6 to C40) petroleum group				22 mg/kg		19.36 mg/kg	0.00194 %	✓		
				TPH								
13		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD	
		603-181-00-X	216-653-1	1634-04-4								
14		benzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD	
		601-020-00-8	200-753-7	71-43-2								



#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
15	toluene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-021-00-3	203-625-9	108-88-3								
16	ethylbenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-023-00-4	202-849-4	100-41-4								
17	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]								
18	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				1 mg/kg	1.884	1.658 mg/kg	0.000166 %		✓	
	006-007-00-5										
19	pH				8.4 pH		8.4 pH	8.4 pH			
			PH								
20	naphthalene				0.11 mg/kg		0.0968 mg/kg	0.0000968 %		✓	
	601-052-00-2	202-049-5	91-20-3								
21	acenaphthylene				0.12 mg/kg		0.106 mg/kg	0.0000106 %		✓	
		205-917-1	208-96-8								
22	acenaphthene				0.05 mg/kg		0.044 mg/kg	0.0000044 %		✓	
		201-469-6	83-32-9								
23	fluorene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
		201-695-5	86-73-7								
24	phenanthrene				0.73 mg/kg		0.642 mg/kg	0.0000642 %		✓	
		201-581-5	85-01-8								
25	anthracene				0.21 mg/kg		0.185 mg/kg	0.0000185 %		✓	
		204-371-1	120-12-7								
26	fluoranthene				2.1 mg/kg		1.848 mg/kg	0.000185 %		✓	
		205-912-4	206-44-0								
27	pyrene				1.8 mg/kg		1.584 mg/kg	0.000158 %		✓	
		204-927-3	129-00-0								
28	benzo[a]anthracene				1 mg/kg		0.88 mg/kg	0.000088 %		✓	
	601-033-00-9	200-280-6	56-55-3								
29	chrysene				1.2 mg/kg		1.056 mg/kg	0.000106 %		✓	
	601-048-00-0	205-923-4	218-01-9								
30	benzo[b]fluoranthene				1.5 mg/kg		1.32 mg/kg	0.000132 %		✓	
	601-034-00-4	205-911-9	205-99-2								
31	benzo[k]fluoranthene				0.67 mg/kg		0.59 mg/kg	0.000059 %		✓	
	601-036-00-5	205-916-6	207-08-9								
32	benzo[a]pyrene; benzo[def]chrysene				1.3 mg/kg		1.144 mg/kg	0.000114 %		✓	
	601-032-00-3	200-028-5	50-32-8								
33	indeno[123-cd]pyrene				0.82 mg/kg		0.722 mg/kg	0.0000722 %		✓	
		205-893-2	193-39-5								
34	dibenz[a,h]anthracene				0.14 mg/kg		0.123 mg/kg	0.0000123 %		✓	
	601-041-00-2	200-181-8	53-70-3								
35	benzo[ghi]perylene				0.91 mg/kg		0.801 mg/kg	0.0000801 %		✓	
		205-883-8	191-24-2								
36	monohydric phenols				<1 mg/kg		<1 mg/kg	<0.0001 %			<LOD
			P1186								
Total:									0.335 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
•	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification



Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and ≤ 75°C"

Force this Hazardous property to non hazardous because Flammable has been discounted as a viable Hazardous Property as the soils considered within this assessment are a solid waste without a free draining liquid phase. Advice from the laboratory indicates that testing for flammability was not appropriate due to the low level of TPH. The waste does not display this hazardous property.

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.00194%)

Classification of sample: WS03---0.50

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
WS03---0.50	Chapter:
Moisture content:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
6.8%	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
(wet weight correction)	Entry:

Hazard properties

None identified

Determinands

Moisture content: 6.8% Wet Weight Moisture Correction applied (MC)

#		Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used	
		EU CLP index number	EC Number	CAS Number									
1		arsenic { arsenic trioxide }				18	mg/kg	1.32	22.15	mg/kg	0.00221 %	✓	
		033-003-00-0	215-481-4	1327-53-3									
2		boron { diboron trioxide }					<0.2	mg/kg	3.22	<0.644	mg/kg	<0.0000644 %	
		005-008-00-8	215-125-8	1303-86-2									
3		cadmium { cadmium oxide }					<0.2	mg/kg	1.142	<0.228	mg/kg	<0.0000228 %	
		048-002-00-0	215-146-2	1306-19-0									
4		chromium in chromium(III) compounds {  chromium(III) oxide (worst case) }					120	mg/kg	1.462	163.46	mg/kg	0.0163 %	✓
			215-160-9	1308-38-9									
5		chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }					<1.8	mg/kg	2.27	<4.086	mg/kg	<0.000409 %	
		024-017-00-8											
6		copper { dicopper oxide; copper (I) oxide }					15	mg/kg	1.126	15.74	mg/kg	0.00157 %	✓
		029-002-00-X	215-270-7	1317-39-1									
7		lead {  lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1		170	mg/kg		158.44	mg/kg	0.0158 %	✓
		082-001-00-6											
8		mercury { mercury dichloride }					<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %	
		080-010-00-X	231-299-8	7487-94-7									
9		nickel { dinickel hexacyanoferrate }					22	mg/kg	2.806	57.525	mg/kg	0.00575 %	✓
		028-037-00-8	238-946-3	14874-78-3									
10		selenium { nickel selenate }					<1	mg/kg	2.554	<2.554	mg/kg	<0.000255 %	
		028-031-00-5	239-125-2	15060-62-5									
11		zinc { zinc sulphate (hydrous) (mono-, hexa- and hepta hydrate); [1] zinc sulphate (anhydrous) [2] }					61	mg/kg	4.398	250.031	mg/kg	0.025 %	✓
		030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]									
12		TPH (C6 to C40) petroleum group					13	mg/kg		12.116	mg/kg	0.00121 %	✓
				TPH									
13		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane					<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %	
		603-181-00-X	216-653-1	1634-04-4									
14		benzene					<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %	
		601-020-00-8	200-753-7	71-43-2									



#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
15	toluene 601-021-00-3	203-625-9	108-88-3		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
16	ethylbenzene 601-023-00-4	202-849-4	100-41-4		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
17	xylene 601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
18	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex } 006-007-00-5				<1 mg/kg	1.884	<1.884 mg/kg	<0.000188 %		<LOD
19	pH		PH		8.2 pH		8.2 pH	8.2 pH		
20	naphthalene 601-052-00-2	202-049-5	91-20-3		0.05 mg/kg		0.0466 mg/kg	0.00000466 %	✓	
21	acenaphthylene 205-917-1	208-96-8			0.09 mg/kg		0.0839 mg/kg	0.00000839 %	✓	
22	acenaphthene 201-469-6	83-32-9			<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
23	fluorene 201-695-5	86-73-7			<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
24	phenanthrene 201-581-5	85-01-8			0.51 mg/kg		0.475 mg/kg	0.0000475 %	✓	
25	anthracene 204-371-1	120-12-7			0.12 mg/kg		0.112 mg/kg	0.0000112 %	✓	
26	fluoranthene 205-912-4	206-44-0			1.4 mg/kg		1.305 mg/kg	0.00013 %	✓	
27	pyrene 204-927-3	129-00-0			1.2 mg/kg		1.118 mg/kg	0.000112 %	✓	
28	benzo[a]anthracene 601-033-00-9	200-280-6	56-55-3		0.76 mg/kg		0.708 mg/kg	0.0000708 %	✓	
29	chrysene 601-048-00-0	205-923-4	218-01-9		0.83 mg/kg		0.774 mg/kg	0.0000774 %	✓	
30	benzo[b]fluoranthene 601-034-00-4	205-911-9	205-99-2		1.1 mg/kg		1.025 mg/kg	0.000103 %	✓	
31	benzo[k]fluoranthene 601-036-00-5	205-916-6	207-08-9		0.46 mg/kg		0.429 mg/kg	0.0000429 %	✓	
32	benzo[a]pyrene; benzo[def]chrysene 601-032-00-3	200-028-5	50-32-8		0.99 mg/kg		0.923 mg/kg	0.0000923 %	✓	
33	indeno[123-cd]pyrene 205-893-2	193-39-5			0.6 mg/kg		0.559 mg/kg	0.0000559 %	✓	
34	dibenz[a,h]anthracene 601-041-00-2	200-181-8	53-70-3		0.13 mg/kg		0.121 mg/kg	0.0000121 %	✓	
35	benzo[ghi]perylene 205-883-8	191-24-2			0.67 mg/kg		0.624 mg/kg	0.0000624 %	✓	
36	monohydric phenols P1186				<1 mg/kg		<1 mg/kg	<0.0001 %		<LOD
Total:								0.0699 %		

Key	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
•	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and ≤ 75°C"

Force this Hazardous property to non hazardous because Flammable has been discounted as a viable Hazardous Property as the soils considered within this assessment are a solid waste without a free draining liquid phase. Advice from the laboratory indicates that testing for flammability was not appropriate due to the low level of TPH. The waste does not display this hazardous property.

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.00121%)



Classification of sample: WS04---0.20



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

Sample details

Sample name:	LoW Code:
WS04---0.20	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
13% (wet weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 13% Wet Weight Moisture Correction applied (MC)

#		Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number								
1		arsenic { arsenic trioxide }				21 mg/kg	1.32	24.122 mg/kg	0.00241 %	✓		
		033-003-00-0	215-481-4	1327-53-3								
2		boron { diboron trioxide }				0.4 mg/kg	3.22	1.121 mg/kg	0.000112 %	✓		
		005-008-00-8	215-125-8	1303-86-2								
3		cadmium { cadmium oxide }				<0.2 mg/kg	1.142	<0.228 mg/kg	<0.0000228 %		<LOD	
		048-002-00-0	215-146-2	1306-19-0								
4		chromium in chromium(III) compounds {  chromium(III) oxide (worst case) }				26 mg/kg	1.462	33.06 mg/kg	0.00331 %	✓		
			215-160-9	1308-38-9								
5		chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<1.8 mg/kg	2.27	<4.086 mg/kg	<0.000409 %		<LOD	
		024-017-00-8										
6		copper { dicopper oxide; copper (I) oxide }				27 mg/kg	1.126	26.447 mg/kg	0.00264 %	✓		
		029-002-00-X	215-270-7	1317-39-1								
7		lead {  lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	290 mg/kg		252.3 mg/kg	0.0252 %	✓		
		082-001-00-6										
8		mercury { mercury dichloride }				<0.3 mg/kg	1.353	<0.406 mg/kg	<0.0000406 %		<LOD	
		080-010-00-X	231-299-8	7487-94-7								
9		nickel { dinickel hexacyanoferrate }				23 mg/kg	2.806	56.139 mg/kg	0.00561 %	✓		
		028-037-00-8	238-946-3	14874-78-3								
10		selenium { nickel selenate }				<1 mg/kg	2.554	<2.554 mg/kg	<0.000255 %		<LOD	
		028-031-00-5	239-125-2	15060-62-5								
11		zinc { zinc sulphate (hydrous) (mono-, hexa- and hepta hydrate); [1] zinc sulphate (anhydrous) [2] }				200 mg/kg	4.398	765.239 mg/kg	0.0765 %	✓		
		030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]								
12		TPH (C6 to C40) petroleum group				<20 mg/kg		<20 mg/kg	<0.002 %		<LOD	
				TPH								
13		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD	
		603-181-00-X	216-653-1	1634-04-4								
14		benzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD	
		601-020-00-8	200-753-7	71-43-2								



#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
15	toluene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-021-00-3	203-625-9	108-88-3								
16	ethylbenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-023-00-4	202-849-4	100-41-4								
17	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]								
18	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<1 mg/kg	1.884	<1.884 mg/kg	<0.000188 %			<LOD
	006-007-00-5										
19	pH				8.1 pH		8.1 pH	8.1 pH			
			PH								
20	naphthalene				0.11 mg/kg		0.0957 mg/kg	0.00000957 %		✓	
	601-052-00-2	202-049-5	91-20-3								
21	acenaphthylene				0.08 mg/kg		0.0696 mg/kg	0.00000696 %		✓	
		205-917-1	208-96-8								
22	acenaphthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
		201-469-6	83-32-9								
23	fluorene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
		201-695-5	86-73-7								
24	phenanthrene				0.41 mg/kg		0.357 mg/kg	0.0000357 %		✓	
		201-581-5	85-01-8								
25	anthracene				0.09 mg/kg		0.0783 mg/kg	0.00000783 %		✓	
		204-371-1	120-12-7								
26	fluoranthene				1.2 mg/kg		1.044 mg/kg	0.000104 %		✓	
		205-912-4	206-44-0								
27	pyrene				1.1 mg/kg		0.957 mg/kg	0.0000957 %		✓	
		204-927-3	129-00-0								
28	benzo[a]anthracene				0.61 mg/kg		0.531 mg/kg	0.0000531 %		✓	
	601-033-00-9	200-280-6	56-55-3								
29	chrysene				0.73 mg/kg		0.635 mg/kg	0.0000635 %		✓	
	601-048-00-0	205-923-4	218-01-9								
30	benzo[b]fluoranthene				0.9 mg/kg		0.783 mg/kg	0.0000783 %		✓	
	601-034-00-4	205-911-9	205-99-2								
31	benzo[k]fluoranthene				0.39 mg/kg		0.339 mg/kg	0.0000339 %		✓	
	601-036-00-5	205-916-6	207-08-9								
32	benzo[a]pyrene; benzo[def]chrysene				0.82 mg/kg		0.713 mg/kg	0.0000713 %		✓	
	601-032-00-3	200-028-5	50-32-8								
33	indeno[123-cd]pyrene				0.48 mg/kg		0.418 mg/kg	0.0000418 %		✓	
		205-893-2	193-39-5								
34	dibenz[a,h]anthracene				0.09 mg/kg		0.0783 mg/kg	0.00000783 %		✓	
	601-041-00-2	200-181-8	53-70-3								
35	benzo[ghi]perylene				0.56 mg/kg		0.487 mg/kg	0.0000487 %		✓	
		205-883-8	191-24-2								
36	monohydric phenols				<1 mg/kg		<1 mg/kg	<0.0001 %			<LOD
			P1186								
Total:									0.12 %		

Key

- User supplied data
- Determinand values ignored for classification, see column 'Conc. Not Used' for reason
- Determinand defined or amended by HazWasteOnline (see Appendix A)
- Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
- <LOD Below limit of detection
- CLP: Note 1 Only the metal concentration has been used for classification



Classification of sample: WS04---0.70



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

Sample details

Sample name:	LoW Code:
WS04---0.70	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
13% (wet weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 13% Wet Weight Moisture Correction applied (MC)

#		Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number								
1		arsenic { arsenic trioxide }				17 mg/kg	1.32	19.528 mg/kg	0.00195 %	✓		
		033-003-00-0	215-481-4	1327-53-3								
2		boron { diboron trioxide }				0.7 mg/kg	3.22	1.961 mg/kg	0.000196 %	✓		
		005-008-00-8	215-125-8	1303-86-2								
3		cadmium { cadmium oxide }				<0.2 mg/kg	1.142	<0.228 mg/kg	<0.0000228 %		<LOD	
		048-002-00-0	215-146-2	1306-19-0								
4		chromium in chromium(III) compounds {  chromium(III) oxide (worst case) }				90 mg/kg	1.462	114.44 mg/kg	0.0114 %	✓		
			215-160-9	1308-38-9								
5		chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }				<1.8 mg/kg	2.27	<4.086 mg/kg	<0.000409 %		<LOD	
		024-017-00-8										
6		copper { dicopper oxide; copper (I) oxide }				17 mg/kg	1.126	16.652 mg/kg	0.00167 %	✓		
		029-002-00-X	215-270-7	1317-39-1								
7		lead {  lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	130 mg/kg		113.1 mg/kg	0.0113 %	✓		
		082-001-00-6										
8		mercury { mercury dichloride }				<0.3 mg/kg	1.353	<0.406 mg/kg	<0.0000406 %		<LOD	
		080-010-00-X	231-299-8	7487-94-7								
9		nickel { dinickel hexacyanoferrate }				20 mg/kg	2.806	48.817 mg/kg	0.00488 %	✓		
		028-037-00-8	238-946-3	14874-78-3								
10		selenium { nickel selenate }				<1 mg/kg	2.554	<2.554 mg/kg	<0.000255 %		<LOD	
		028-031-00-5	239-125-2	15060-62-5								
11		zinc { zinc sulphate (hydrous) (mono-, hexa- and hepta hydrate); [1] zinc sulphate (anhydrous) [2] }				110 mg/kg	4.398	420.882 mg/kg	0.0421 %	✓		
		030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]								
12		TPH (C6 to C40) petroleum group				<20 mg/kg		<20 mg/kg	<0.002 %		<LOD	
				TPH								
13		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD	
		603-181-00-X	216-653-1	1634-04-4								
14		benzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD	
		601-020-00-8	200-753-7	71-43-2								



#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
15	toluene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-021-00-3	203-625-9	108-88-3								
16	ethylbenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %			<LOD
	601-023-00-4	202-849-4	100-41-4								
17	xylene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]								
18	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<1 mg/kg	1.884	<1.884 mg/kg	<0.000188 %			<LOD
	006-007-00-5										
19	pH				8.3 pH		8.3 pH	8.3 pH			
			PH								
20	naphthalene				0.05 mg/kg		0.0435 mg/kg	0.00000435 %		✓	
	601-052-00-2	202-049-5	91-20-3								
21	acenaphthylene				0.06 mg/kg		0.0522 mg/kg	0.00000522 %		✓	
		205-917-1	208-96-8								
22	acenaphthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
		201-469-6	83-32-9								
23	fluorene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
		201-695-5	86-73-7								
24	phenanthrene				0.28 mg/kg		0.244 mg/kg	0.0000244 %		✓	
		201-581-5	85-01-8								
25	anthracene				0.06 mg/kg		0.0522 mg/kg	0.00000522 %		✓	
		204-371-1	120-12-7								
26	fluoranthene				0.96 mg/kg		0.835 mg/kg	0.0000835 %		✓	
		205-912-4	206-44-0								
27	pyrene				0.86 mg/kg		0.748 mg/kg	0.0000748 %		✓	
		204-927-3	129-00-0								
28	benzo[a]anthracene				0.53 mg/kg		0.461 mg/kg	0.0000461 %		✓	
	601-033-00-9	200-280-6	56-55-3								
29	chrysene				0.57 mg/kg		0.496 mg/kg	0.0000496 %		✓	
	601-048-00-0	205-923-4	218-01-9								
30	benzo[b]fluoranthene				0.75 mg/kg		0.653 mg/kg	0.0000653 %		✓	
	601-034-00-4	205-911-9	205-99-2								
31	benzo[k]fluoranthene				0.23 mg/kg		0.2 mg/kg	0.00002 %		✓	
	601-036-00-5	205-916-6	207-08-9								
32	benzo[a]pyrene; benzo[def]chrysene				0.68 mg/kg		0.592 mg/kg	0.0000592 %		✓	
	601-032-00-3	200-028-5	50-32-8								
33	indeno[123-cd]pyrene				0.42 mg/kg		0.365 mg/kg	0.0000365 %		✓	
		205-893-2	193-39-5								
34	dibenz[a,h]anthracene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %			<LOD
	601-041-00-2	200-181-8	53-70-3								
35	benzo[ghi]perylene				0.42 mg/kg		0.365 mg/kg	0.0000365 %		✓	
		205-883-8	191-24-2								
36	monohydric phenols				<1 mg/kg		<1 mg/kg	<0.0001 %			<LOD
			P1186								
Total:									0.0771 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
•	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Appendix A: Classifier defined and non GB MCL determinands

■ chromium(III) oxide (worst case) (EC Number: 215-160-9, CAS Number: 1308-38-9)

Description/Comments: Data from C&L Inventory Database

Data source: <https://echa.europa.eu/information-on-chemicals/cl-inventory-database/-/discli/details/33806>

Data source date: 17 Jul 2015

Hazard Statements: Acute Tox. 4; H332, Acute Tox. 4; H302, Eye Irrit. 2; H319, STOT SE 3; H335, Skin Irrit. 2; H315, Resp. Sens. 1; H334, Skin Sens. 1; H317, Repr. 1B; H360FD, Aquatic Acute 1; H400, Aquatic Chronic 1; H410

■ lead compounds with the exception of those specified elsewhere in this Annex (worst case)

GB MCL index number: 082-001-00-6

Description/Comments: Worst Case: IARC considers lead compounds Group 2A; Probably carcinogenic to humans; Lead REACH Consortium, following MCL protocols, considers lead compounds from smelting industries, flue dust and similar to be Carcinogenic category 1A

Additional Hazard Statement(s): Carc. 1A; H350

Reason for additional Hazards Statement(s):

20 Nov 2021 - Carc. 1A; H350 hazard statement sourced from: IARC Group 2A (Sup 7, 87) 2006; Lead REACH Consortium www.reach-lead.eu/substanceinformation.html (worst case lead compounds). Review date 29/09/2015

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

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

Data source: WM3 1st Edition 2015

Data source date: 25 May 2015

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

■ ethylbenzene (EC Number: 202-849-4, CAS Number: 100-41-4)

GB MCL index number: 601-023-00-4

Description/Comments:

Additional Hazard Statement(s): Carc. 2; H351

Reason for additional Hazards Statement(s):

20 Nov 2021 - Carc. 2; H351 hazard statement sourced from: IARC Group 2B (77) 2000

■ salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex

GB MCL index number: 006-007-00-5

Description/Comments: Conversion factor based on a worst case compound: sodium cyanide

Additional Hazard Statement(s): EUH032 >= 0.2 %

Reason for additional Hazards Statement(s):

20 Nov 2021 - EUH032 >= 0.2 % hazard statement sourced from: WM3, Table C12.2

■ pH (CAS Number: PH)

Description/Comments: Appendix C4

Data source: WM3 1st Edition 2015

Data source date: 25 May 2015

Hazard Statements: None.

■ acenaphthylene (EC Number: 205-917-1, CAS Number: 208-96-8)

Description/Comments: Data from C&L Inventory Database

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

Data source date: 17 Jul 2015

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

■ acenaphthene (EC Number: 201-469-6, CAS Number: 83-32-9)

Description/Comments: Data from C&L Inventory Database

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

Data source date: 17 Jul 2015

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

■ fluorene (EC Number: 201-695-5, CAS Number: 86-73-7)

Description/Comments: Data from C&L Inventory Database

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

Data source date: 06 Aug 2015

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

• **phenanthrene** (EC Number: 201-581-5, CAS Number: 85-01-8)

Description/Comments: Data from C&L Inventory Database

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

Data source date: 06 Aug 2015

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

• **anthracene** (EC Number: 204-371-1, CAS Number: 120-12-7)

Description/Comments: Data from C&L Inventory Database

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

Data source date: 17 Jul 2015

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

• **fluoranthene** (EC Number: 205-912-4, CAS Number: 206-44-0)

Description/Comments: Data from C&L Inventory Database

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

Data source date: 21 Aug 2015

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

• **pyrene** (EC Number: 204-927-3, CAS Number: 129-00-0)

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

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

Data source date: 21 Aug 2015

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

• **indeno[123-cd]pyrene** (EC Number: 205-893-2, CAS Number: 193-39-5)

Description/Comments: Data from C&L Inventory Database

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

Data source date: 06 Aug 2015

Hazard Statements: Carc. 2; H351

• **benzo[ghi]perylene** (EC Number: 205-883-8, CAS Number: 191-24-2)

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

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

Data source date: 23 Jul 2015

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

• **monohydric phenols** (CAS Number: P1186)

Description/Comments: Combined hazards statements from harmonised entries in CLP for phenol, cresols and xylenols (604-001-00-2, 604-004-00-9, 604-006-00-X)

Data source: CLP combined data

Data source date: 26 Mar 2019

Hazard Statements: Muta. 2; H341 , Acute Tox. 3; H331 , Acute Tox. 3; H311 , Acute Tox. 3; H301 , STOT RE 2; H373 , Skin Corr. 1B; H314 , Skin Corr. 1B; H314 >= 3 % , Skin Irrit. 2; H315 1 <= conc. < 3 % , Eye Irrit. 2; H319 1 <= conc. < 3 % , Aquatic Chronic 2; H411

Appendix B: Rationale for selection of metal species

arsenic {arsenic trioxide}

Reasonable case CLP species based on hazard statements/molecular weight and most common (stable) oxide of arsenic. Industrial sources include: smelting; main precursor to other arsenic compounds.

boron {diboron trioxide}

Reasonable case CLP species based on hazard statements/ molecular weight, physical form and low solubility. Industrial sources include: fluxing agent for glass/enamels; additive for fibre optics, borosilicate glass.

cadmium {cadmium oxide}

Reasonable case CLP species based on hazard statements/molecular weight, very low solubility in water. Industrial sources include: electroplating baths, electrodes for storage batteries, catalysts, ceramic glazes, phosphors, pigments and nematocides. Worst case compounds in CLP: cadmium sulphate, chloride, fluoride & iodide not expected as either very soluble and/or compound's industrial usage not related to site history.

chromium in chromium(III) compounds {chromium(III) oxide (worst case)}

Reasonable case species based on hazard statements/molecular weight. Industrial sources include: tanning, pigment in paint, inks and glass.

chromium in chromium(VI) compounds {chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex}

Worst case species based on hazard statements/molecular weight.

copper {dicopper oxide; copper (I) oxide}

Reasonable case CLP species based on hazard statements/molecular weight and insolubility in water. Industrial sources include: oxidised copper metal, brake pads, pigments, antifouling paints, fungicide. Worse case copper sulphate is very soluble and likely to have been leached away if ever present and/or not enough soluble sulphate detected.

lead {lead compounds with the exception of those specified elsewhere in this Annex (worst case)}

Metallic compounds are not considered to be present in their chromate form as the laboratory analysis has demonstrated that insufficient concentrations of hexavalent chromium are present to enable the formation of chromates within the soils. Next worst case species chosen.

mercury {mercury dichloride}

Worst case CLP species based on hazard statements/molecular weight.

nickel {dinickel hexacyanoferrate}

Metallic compounds are not considered to be present in their chromate form as the laboratory analysis has demonstrated that insufficient concentrations of hexavalent chromium are present to enable the formation of chromates within the soils. Next worst case species chosen.

selenium {nickel selenate}

Worst case CLP species based on hazard statements/molecular weight.

zinc {zinc sulphate (hydrous) (mono-, hexa- and hepta hydrate); [1] zinc sulphate (anhydrous) [2]}

Metallic compounds are not considered to be present in their chromate form as the laboratory analysis has demonstrated that insufficient concentrations of hexavalent chromium are present to enable the formation of chromates within the soils. Next worst case species chosen.

cyanides {salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex}

Harmonised group entry used as most reasonable case as complex cyanides and those specified elsewhere in the annex are not likely to be present in this soil: [Note conversion factor based on a worst case compound: sodium cyanide].

Appendix C: Version

HazWasteOnline Classification Engine: **WM3 1st Edition v1.2.GB - Oct 2021**
HazWasteOnline Classification Engine Version: 2024.30.5942.10989 (30 Jan 2024)
HazWasteOnline Database: 2024.26.5938.10982 (26 Jan 2024)

This classification utilises the following guidance and legislation:

WM3 v1.2.GB - Waste Classification - 1st Edition v1.2.GB - Oct 2021

CLP Regulation - Regulation 1272/2008/EC of 16 December 2008

1st ATP - Regulation 790/2009/EC of 10 August 2009

2nd ATP - Regulation 286/2011/EC of 10 March 2011

3rd ATP - Regulation 618/2012/EU of 10 July 2012

4th ATP - Regulation 487/2013/EU of 8 May 2013

Correction to 1st ATP - Regulation 758/2013/EU of 7 August 2013

5th ATP - Regulation 944/2013/EU of 2 October 2013

6th ATP - Regulation 605/2014/EU of 5 June 2014

WFD Annex III replacement - Regulation 1357/2014/EU of 18 December 2014

Revised List of Waste 2014 - Decision 2014/955/EU of 18 December 2014

7th ATP - Regulation 2015/1221/EU of 24 July 2015

8th ATP - Regulation (EU) 2016/918 of 19 May 2016

9th ATP - Regulation (EU) 2016/1179 of 19 July 2016

10th ATP - Regulation (EU) 2017/776 of 4 May 2017

HP14 amendment - Regulation (EU) 2017/997 of 8 June 2017

13th ATP - Regulation (EU) 2018/1480 of 4 October 2018

14th ATP - Regulation (EU) 2020/217 of 4 October 2019

15th ATP - Regulation (EU) 2020/1182 of 19 May 2020

The Chemicals (Health and Safety) and Genetically Modified Organisms (Contained Use)(Amendment etc.) (EU Exit)

Regulations 2020 - UK: 2020 No. 1567 of 16th December 2020

The Waste and Environmental Permitting etc. (Legislative Functions and Amendment etc.) (EU Exit) Regulations 2020 - UK: 2020 No. 1540 of 16th December 2020

GB MCL List - version 1.1 of 09 June 2021

GB MCL List v2.0 - version 2.0 of 20th October 2023



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