

**Supplementary Site
Investigation & Risk
Assessment Report**

Project Name: Kerswell Close

Location: Tottenham, London, N15 5HT

Client: Selsdon Building Contractors Limited

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SUMMARY

The site, which extends to approximately 1,800m² comprises an area of soft landscaping, car parking and pedestrian access associated with residential properties on the southern side of Kerswell Close. It is proposed to redevelop the site with a part-3 and part-6 storey building, comprising 44 no. one bedroom affordable residential units, with amenity space and site landscaping including new publicly accessible pedestrian routes and tree planting.

Geological records indicate the site to be underlain by London Clay.

A Phase 1 Environmental Study has previously been undertaken for the site by RSK, and indicates that the site has a history of residential use.

A detailed UXO risk assessment was provided by the client. Given the relatively high bombing density the London Borough of Haringey sustained during WWII, and recorded bomb strikes in the vicinity of the site, the site was considered to be of Low to Medium risk from UXO. Therefore, it was recommended that mitigation measures, including clearance of borehole locations by a UXO Engineer with a magnetometer, be allowed for during any intrusive site investigation works.

A single phase of intrusive investigation was carried out. There were areas of the site that were inaccessible during the fieldwork phase. It should not be assumed that the same ground conditions would apply to these inaccessible areas.

The soils encountered comprised a covering of Made Ground to depths of between 0.6m and 1.5m bgl. over silty CLAY.

Groundwater was not encountered in any of the exploratory holes during excavation/drilling. During the return ground gas monitoring visits completed to date, groundwater was encountered at depth of 0.83m to 1.95m bgl. At depths of between 0.83m and 1.95m.

The Made Ground has been found to contain elevated concentrations of lead and PAH. Loose fibres of asbestos have also been recorded, and in one location asbestos containing material (ACM) in the form of fragments of asbestos cement was identified. Given the footprint of the new proposed building, it is assumed that the majority of the Made Ground within the landscaped bunds will be removed from site in order to facilitate its redevelopment. Where Made Ground remains within proposed soft landscaped areas, this will require either removal or capping with clean soils in order to protect future site residents.

Potential pollutant linkages have also been identified for ground gases. Monitoring is ongoing, with a final ground gas risk assessment report to be issued following completion of the final visit.

The presence of contamination may affect the classification of waste soils, or the potential for their re-use.

The contamination screening values used are valid at the time of writing but may be subject to change and any such changes will have implications for the assessments based on them. Their validity should be confirmed at the time of site development.

As with any site, areas of contamination not identified during investigation works may come to light during the course of redevelopment. Accordingly, a discovery strategy must be in place during the redevelopment to ensure that any hitherto unknown contamination is identified and dealt with in an appropriate manner. Depending on the nature of any such contamination, it may prove necessary to reassess the remedial strategy for the site. The presence of contamination may affect the classification of waste soils, or the potential for their re-use.

A formal remediation strategy and verification plan should be agreed with the regulatory authorities prior to commencement of any remedial works.

The investigation was conducted and this report has been prepared for the sole internal use and reliance of Selesdon Building Contractors Limited and their appointed Engineers. This report shall not be relied upon or transferred to any other parties without the express written authorisation of Southern Testing Laboratories Ltd. If an unauthorised third party comes into possession of this report they rely on it at their peril and the authors owe them no duty of care and skill.

The findings and opinions conveyed via this investigation report are based on information obtained from a variety of sources as detailed within this report, and which Southern Testing Laboratories Ltd. believes are reliable.

Nevertheless, Southern Testing Laboratories Ltd. cannot and does not guarantee the authenticity or reliability of the information it has obtained from others.

The recommendations contained in this report are made in respect of the particular context of the investigation as described in the report and may not be appropriate to alternative development schemes. This report should be considered in its entirety and Southern Testing Laboratories Ltd accepts no responsibility for and excludes liability in respect of any omission or alteration made by others, and any use of the report for any purpose other than that for which it was produced.

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A INTRODUCTION

1 Authority

Our authority for carrying out this work is contained in your project order form (Ref PO-050-019 dated 4 August 2023).

2 Location

The site is located to the north of the A305 Seven Sisters Road, approximately 450m to the southwest of Seven Sisters Railway Station, in Tottenham, North London. The approximate National Grid Reference of the site is TQ 33096 88526. The site location is indicated on Figure 1 within Appendix A.

3 Proposed Construction

It is proposed to construct a part-3 and part-6 storey building, comprising 44 no. one bedroom affordable residential units, with amenity space and site landscaping including new publicly accessible pedestrian routes and tree planting.

For the purposes of the contamination risk assessment, the proposed development land use is classified as Public Open Space (residential) CLEA Model Ref [1] / C4SL Report Ref [2].

The gas sensitivity of the proposed development is rated as Moderate CIRIA C665 Ref [3].

4 Object

This is a Phase II contamination (risk estimation and evaluation) investigation (Tier 1).

The object of the investigation was to assess the likely nature and extent of soil, groundwater and soil gas contamination on the site.

5 Scope

This report presents our exploratory hole logs and test results and our interpretation of these data.

A UXO risk assessment was supplied to us by Selsdon Building Contractors in advance of the investigation works being undertaken. This report concluded there was a potential risk to the site from UXO, and therefore a watching brief was undertaken by a UXO engineer during the intrusive site works.

As with any site there may be differences in soil conditions between exploratory hole positions.

The site investigation has been completed with reference to BS 5930 Ref [4] and BS 10175 Ref [5].

Geotechnical issues were not part of the brief and are not considered in this report.

Waste Classification of soils has been included within the brief for the investigation.

The findings and opinions conveyed via this investigation report are based on information obtained from a variety of sources as detailed within this report, and which Southern Testing Laboratories Ltd. believes are reliable. Nevertheless, Southern Testing Laboratories Ltd. cannot and does not guarantee the authenticity or reliability of the information it has obtained from others.

The investigation was conducted and this report has been prepared for the sole internal use and reliance of Selsdon Building Contractors Limited and their appointed Engineers. This report shall not be relied upon or transferred to any other parties without the express written authorisation of Southern Testing Laboratories Ltd. If an unauthorised third party comes into possession of this report they rely on it at their peril and the authors owe them no duty of care and skill.

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The contamination screening values used are valid at the time of writing but may be subject to change and any such changes will have implications for the assessments based on them. Their validity should be confirmed at the time of site development.

B DESK STUDY AND WALKOVER SURVEY

6 Desk Study

A Phase 1 Environmental Study has previously been undertaken for the site by RSK in 2017 (ref. 29435 (R01 (00)). A summary of the salient points from this report are present in the sections below.

6.1 Geology

The British Geological Survey Map No 256 North London (2006) indicates that the site geology consists of London Clay.

6.1.1 London Clay

The London Clay mainly comprises blue-grey or grey-brown fissured clay and silty clay, which weathers to brown near the surface. It commonly contains thin courses of carbonate concretions ('cementstone nodules'), selenite crystals and disseminated pyrite. It also includes a few thin beds of shells and fine sand partings or pockets of sand, which commonly increase towards the base and towards the top of the formation.

Although slopes will stand in the clay at steep angles in the short term, the long-term stable slope angle is about 7° for grassed, or cleared slopes, and a few degrees more for wooded slopes.

This formation is known to contain pyrite.

6.2 Radon Risk

With reference to UK Radon Ref [6] and BRE Radon Ref [7] guidance: no radon protection is required on this site.

6.3 Hydrology and Hydrogeology

The London Clay is classified as unproductive strata in terms of groundwater vulnerability.

The Lambeth Group, Thanet Sands and Chalk underlie the London Clay, which from a nearby borehole (around 30m to the south of the site) was proven to a depth of 21m bgl. From RSK's report it is understood that the southern half of the subject site lies within a Source Protection Zone (SPZ) I (Inner catchment) and the northern half lies within a SPZ II (Outer catchment), with a number of groundwater abstractions located in the vicinity of the site. These abstractions are assumed to be associated with the Lambeth Group, and/or underlying Chalk aquifers.

The nearest identified water features are an undefined culvert around 200m north east of the site, and land drainage associated with a railway embankment approximately 215m to the east of the site.

On the basis of the above, the site is not considered to be vulnerable in terms of the potential migration of mobile contamination down through the shallow soils; or from the lateral migration of potentially mobile contamination from an off-site source.

6.4 Historical Ordnance Survey Maps

It is understood from RSK's report that the site comprised undeveloped land to circa 1896, at which time it was largely covered by houses, with Russell Road crossing the south west corner. In the late 1970's/early 1980's the site was extensively redeveloped, as per the present day layout, with the exception of what are possibly lock-up garages located in the existing car park between 1982-2014.

The surrounding area has a similar history to the site itself, comprising farmland up until circa 1896, when extensive development with high-density housing took place. The area then remained significantly unchanged, until the late 1970's when the area underwent significant redevelopment, including the construction of Kerswell Close.

6.5 Environmental Databases

Information from the environmental database did not identify any records of any potentially significant off-site sources of potential contamination, contaminative land uses or other features.

6.6 Ground Gas Risk

There are no records of historical or licensed landfill sites within a 1500m radius of the site.

From the historical OS mapping a brickworks is noted 70m to the northwest, and a small pond 200m to the south of the site. Neither feature is shown on the 1896 edition OS map, with their locations redeveloped for residential use.

6.7 UXO Risk Management

The possibility of unexploded ordnance (UXO) being encountered on a site falls within the category of a potentially significant risk and should be addressed as a legal duty under the Construction (Design and Management) Regulations by the Client as early as possible in a project.

The CIRIA publication C681 Ref [8] has been developed to provide a consistent framework for the management of potential risks posed by UXO during site investigation and groundwork phases of construction. The process adopts a tiered approach, divided into four distinct stages; Preliminary risk assessment, Detailed risk assessment, Risk mitigation and Implementation.

A detailed UXO risk assessment was provided by the client. Given the relatively high bombing density the London Borough of Haringey sustained during WWII, and recorded bomb strikes in the vicinity of the site, the site was considered to be of Low to Medium risk from UXO. Therefore, it was recommended that mitigation measures, including clearance of borehole locations by a UXO Engineer with a magnetometer, be allowed for during any intrusive site investigation works.

6.8 Other Information Sources: Pell Frischmann – Geotechnical Design Report

Pell Frischmann produced a Geotechnical Design Report (ref. 105079-PEF-xx-xx-RP-GT-10001 P02) dated December 2021, using information contained in a Factual Ground Investigation Report by Land Science (ref. LS5646) dated October 2021. Both reports were prepared for Haringey Borough Council, however, it is understood that Selsdon Building Contractors Ltd. has reliance on these reports.

A summary of the findings of Land Sciences report and subsequent recommendations provided by Pell Frischmann, with reference to geoenvironmental considerations are provided below.

The specification for the site works was given by Pell Frischmann, and comprised 1 no. 30m and 2 no. 25m cable percussive boreholes, 4 no. 2m deep machine dug trial pits and 4 no. foundation inspection pits. One of the cable percussive boreholes was installed with gas and groundwater monitoring wells, and one of the machine dug trial pits was used for undertaking soakage testing.

The soils found in the trial holes comprised Made Ground to depths of between 0.5m and 1.8m bgl, over River Terrace Deposits to depths of between 0.55m and 0.6m (within the car park only), with the London Clay below both the Made Ground and River Terrace Deposits, to a depth of 30m+. The Made Ground comprised dark brown sandy, gravelly clay with flint, brick, tile, plastic and metal. The River Terrace Deposits comprised dark grey to orange fine to medium sand and fine to coarse flint gravel.

With the exception of the Made Ground, no visual or olfactory evidence of potential contamination was observed within the Made Ground.

Groundwater was not encountered in any of the exploratory hole locations.

Laboratory analysis for a range of potential common contaminants identified concentrations of lead above the screening value for a residential without home-grown produce land use in three samples of Made Ground. Loose fibres of chrysotile (white) asbestos were also identified in one sample of Made Ground, with a quantification of <0.001%, which is the laboratory limit of detection.

Combined groundwater and ground gas monitoring wells were installed in BH02 (on the southwest of the site) with response zones at depths of 1-2m bgl in the Made Ground, and 3-10m bgl in the London Clay. Six return monitoring visits were made. Significantly elevated concentrations of both methane and carbon dioxide were recorded throughout the monitoring period, within both of the installations.

The report recommended that as only limited geoenvironmental assessment had been undertaken, further investigation was required. With respect to the elevated concentrations of ground gases, it was recommended that consultation be had with the gas utilities providers, and that additional ground gas monitoring be undertaken. It was also recommended that further risk assessment, and potentially verification sampling be undertaken, following the removal of the bund of Made Ground.

7 Site Walkover Survey

The site works were undertaken on the 3rd October 2023.

7.1 General Site Description and Boundaries

The site comprised a small car park and area of landscaped open space to the south and east of properties around Kerswell Close. A small, single storey building, understood to have most recently been used as a Chinese food shop, was situated on the southern side of the site. At the time of the site works, the site had been secured from public access by timber hoarding, with a locked gate off Kerswell Close providing site access.

The site was bounded to the west and north by two-storey houses. To the southwest of the site was St Anne's Road, with Seven Sisters Road along the southeast side of the site.

7.2 Topography and Drainage

The car park on the northern side of the site was flat and level in keeping with the surrounding area. The landscaped area on the southern side of the site comprised two separate grass covered mounds, with a footpath running between them, from the junction of St. Anne's Road and Seven Sisters Road. This provided pedestrian access to the car parking area and houses. The mounds were approximately 1.5-2.0m in height above site level.

Formal surface water drainage was noted within the car park. It is assumed that this is connected to the mains sewer which serves the surrounding houses.

7.3 Vegetation

Around 50% of the site comprises soft landscaping, predominantly on the south of the site (comprising the soil mounds), with two small grass covered areas on the north of the site. There are a number of semi-mature trees across the top of the soil mounds. Species include Horse Chestnut, Sycamore and Ash. It is understood that some of these trees are the subject of Tree Protection Orders (TPO's), with fencing having been erected to prevent access and potential damage to the tree roots, during the redevelopment works.

7.4 Buildings and Land Use on Site and Nearby

A small, single store building (understood to have most recently been used as a Chinese food shop), was situated on the southern side of the site. This is of brick construction, with a flat roof. At the time of the site works access to the building was not possible due to the erection of the site hoarding around the perimeter of the site.

The surrounding area has largely, high density, residential land use. An area of commercial/industrial buildings were located approximately 50m to the northeast of the site.

7.5 Inaccessible Site Areas

The interior of the building on the south of the site was not accessible at the time of the site works. Access was also not possible to the very western and eastern sides of the site, due to the erection of fencing to protect the trees.

7.6 Site Photographs

A series of photographs showing the site is included in Appendix E.

C PRELIMINARY SITE MODELS

8 Conceptual Site Model

In the context of this report, the conceptual model summarises the potential pollutant linkages identified for the site and forms the basis of the risk assessment for the site. The preliminary model comprises the potential sources of contamination, receptors that could be harmed and exposure pathways identified from the Desk Study and walkover survey. These potential linkages form the basis upon which the investigation is designed and reported.

8.1 Potential Sources of Contamination

The site has a history of residential use and is located within a residential area. Therefore, the risk to the site from potential contamination is considered to be quite limited.

8.1.1 On-Site Sources

Potential Source	Potential Contaminants
Made Ground from the previous phase of residential development on the site	Variable, may include: Metals, non-metals, polyaromatic hydrocarbons (PAH), petroleum hydrocarbons & asbestos containing materials (ACMs).
Building to the south of the site	Asbestos containing materials
Ground gases	Methane and carbon dioxide

The site has a history of residential use, with the demolition of the original houses having taken place circa late 1970's/early 1980's. Previous intrusive site investigation works and laboratory analysis undertaken by Land Science identified Made Ground across the site, which contained elevated concentrations of lead, and loose fibres of asbestos. On the basis of the previous test results, the risk from this potential source of contamination is considered to be low to moderate.

Given the age of the building on the south of the site, it is possible that it contains asbestos containing material. The risk is considered low, as it is assumed that an asbestos survey (if not already completed) will be undertaken, and any ACM's identified will be removed, prior to the demolition of the building.

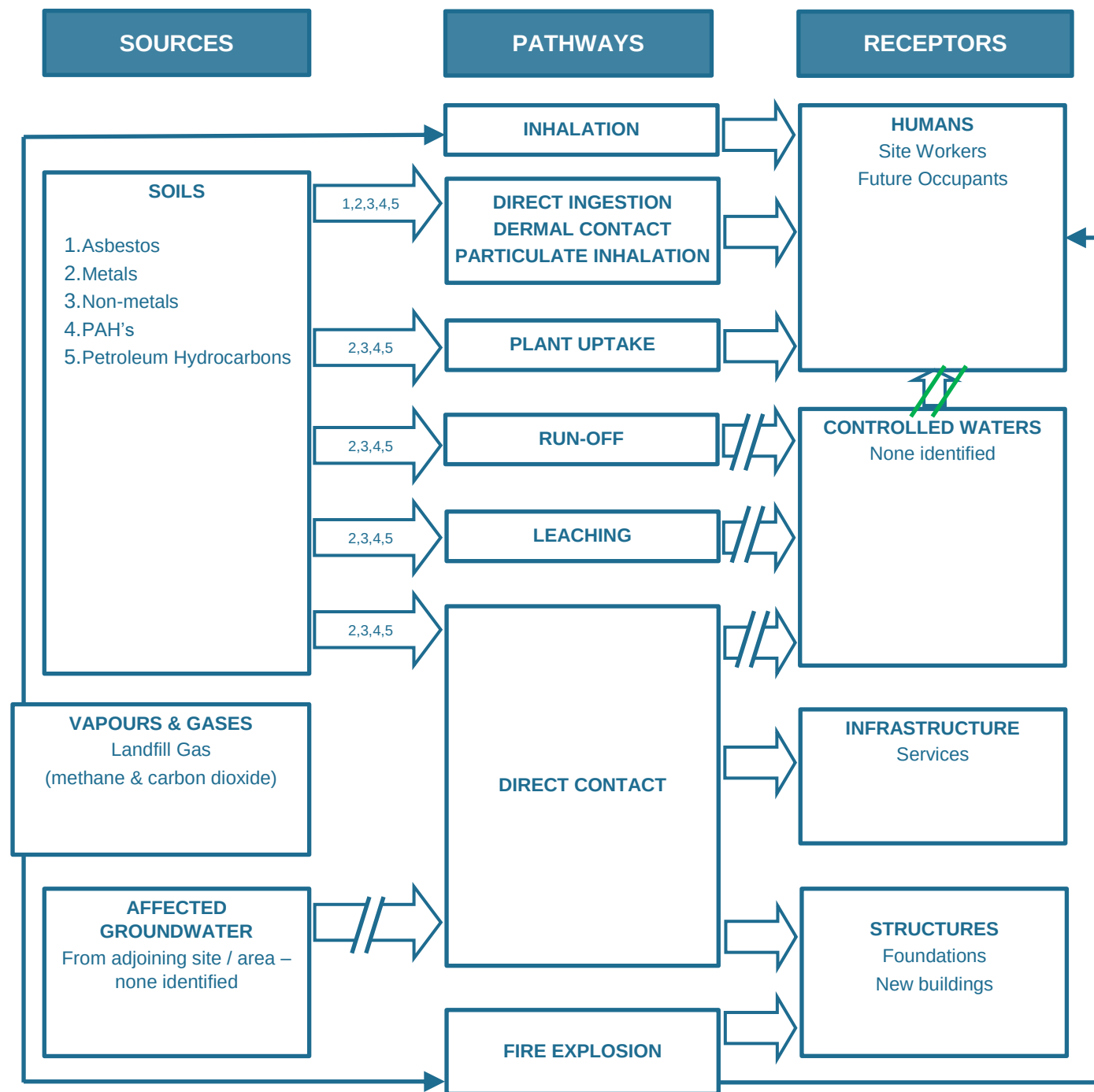
Ground gas monitoring undertaken by Land Science previously identified elevated concentrations of both methane and carbon dioxide on the site. The sources of these gases is considered likely to be a leaking gas main. At this stage the risk to the site from ground gases is therefore considered to be moderate to high.

8.1.2 Off-Site Sources

No potential off-site sources of contamination have been identified.

8.2 Pollutant Linkages and Conceptual Site Model Summary

The following diagram shows the potential pollutant linkages identified for the site and summarises the preliminary conceptual model:



D GROUND INVESTIGATION

9 Strategy and Method

The strategy adopted for the intrusive investigation comprised the following:

Activity / Method	Purpose	Max Depth Range (mbgl)	Installations / Notes
WLS01 – 04 Dynamic Windowless Sampling	Boreholes to investigate the shallow ground conditions within external areas. To allow collection of samples for contamination testing. Installation of shallow land gas and groundwater monitoring wells.	3.0	50mm gas / groundwater monitoring wells installed within all four boreholes
HA01 & HA02 Hand-dug	Hand dug trial holes to sample the shallow soils	1.0	

Exploratory hole locations are shown in Figures 2a and b in Appendix A.

In-situ test and sampling methods descriptions employed are given in Appendix B together with the test results.

SPT Energy Ratio certificates and a Summary Table of SPT N Values is provided within Appendix B.

The presence of buildings and underground services restricted the fieldwork.

10 Weather Conditions

The site works were undertaken on the 3rd October 2023, at which time the weather was dry and overcast.

The weather for the month preceding the site works had been warmer and wetter than average for the time of year.

11 Soils as Found

The soils encountered are described in detail in the attached exploratory hole logs (Appendix A), but in general comprised a covering of Made Ground over silty CLAY. A summary is given below.

Depth (m)	Thickness (m)	Soil Type	Description
GL – 0.15	0.15	TOPSOIL	Dark brown silty CLAY (WLS04 only).
GL – 0.6/1.5	0.6 – 1.5	MADE GROUND	Friable mid brown silty sand with variable amounts of fine to coarse gravel of brick, concrete, chalk, clinker, flint, rare glass, ceramic and concrete cobbles.
0.9/1.4 – 2.1/2.5	1.1 – 1.2	Silty CLAY	Desiccated mid brown/orange-brown mottled red-orange silty CLAY with fine rootlets and rare yellow-orange silty partings. (WLS0.1 & WLS02 only)
0.7/2.1 – 3.0	0.9 – 2.3	Silty CLAY	Stiff mid brown with grey-blue mottling and yellow silty patches, silty CLAY. (WLS01, WLS03 & WLS04 only)

The soils found were similar to those found by Land Science, although River Terrace Deposits were not encountered within the trial hole located in the car park (WLS03 & WLS04) during this investigation.

11.1 Visual and Olfactory Evidence of Contamination

Evidence of possible contamination in the form of Made Ground was recorded in all of the trial hole locations.

These occurrences are discussed in Section E.

12 Groundwater Observations

Groundwater was not observed in any of the exploratory holes during excavation/drilling.

E DISCUSSION OF GEOENVIRONMENTAL TEST RESULTS AND RECOMMENDATIONS

13 Analytical Framework

There is no single methodology that covers all the various aspects of the assessment of potentially contaminated land and groundwater. Therefore, the analytical framework adopted for this investigation is made up of a number of procedures, which are outlined below. All of these are based on a Risk Assessment methodology centred on the identification and analysis of Source – Pathway – Receptor linkages.

The CLEA model Ref [1], provides a methodology for quantitative assessment of the long-term risks posed to human health by exposure to contaminated soils. Toxicological data is used to calculate a Soil Guideline Value (SGV) for an individual contaminant, based on the proposed site use; these represent minimal risk concentrations and may be used as screening values.

In the absence of any published SGVs for certain substances, Southern Testing have derived or adopted Tier 1 screening values for initial assessment of the soil, based on available current UK guidance including the LQM/CIEH S4UL's Ref [9] and CL:AIRE Soil Generic Assessment Criteria Ref [10]. In addition, in 2014, DEFRA Ref [11] published the results of a research programme to develop screening values to assist decision making under Part 2A of the Environmental Protection Act. Category 4 screening levels were published for 6 substances, with reference to human health risk only. This guidance includes revisions of the CLEA exposure parameters, presenting parameters for public open space land use scenarios, and also of the toxicological approach. The screening levels represent a low risk scenario, based on a 'Low Level of Toxicological Concern' rather than the 'Minimal Risk' of CLEA, and the analytical results of this investigation may be considered relative to these levels.

Site-specific assessments are undertaken wherever possible and/or applicable.

CLEA requires a statistical treatment of the test results to take into account the normal variations in concentration of potential contaminants in the soil and allow comparisons to be made with published guidance.

Ground gases are assessed in accordance with the guidance given in CIRIA C665 Ref [3] and BS8485 Ref [12].

The contamination screening values used are valid at the time of writing but may be subject to change and any such changes will have implications for the assessments based upon them. Their validity should be confirmed at the time of site development.

14 Site Investigation – Soils

14.1 Sampling Regime

The number of sample locations was limited and intended to provide general site coverage.

Access was restricted by the presence of buildings and buried services.

14.2 Testing

The potential for contamination by metals, non-metals, polycyclic aromatic hydrocarbons (PAH), petroleum hydrocarbons & asbestos containing materials (ACMs) was identified in the preliminary conceptual model. Therefore, the following tests were selected.

Test Suite	Number of Samples	Soil Tested
STL Key Contamination Suite	8	6 No. Made Ground 2 No. Natural Ground
Asbestos Screen	8	6 No. Made Ground 2 No. Natural Ground
Total Petroleum Hydrocarbons	2	2 No. Made Ground
Waste Acceptance Criteria (WAC) testing	2	2 No. Made Ground

The test results are presented in full in Appendix C. A summary and discussion of the significance of the results and identified contamination sources is given below.

14.3 Test Results and Identified Contamination Sources

14.3.1 General Contaminants

The results of the key contaminant tests have been analysed in accordance with the CLEA methodology. The samples have been grouped into two populations comprising Made Ground and natural soil. For each parameter in each population the sample mean is calculated and compared to a Tier 1 screening value. If the sample mean exceeds the screening value, the soil may be regarded as contaminated and further assessment may be required. If neither the sample mean nor any single value exceeds the screening value, the soil may be regarded as not contaminated, though further confirmatory assessment may be required. Where any single parameter value exceeds the screening value but the sample mean does not, further statistical analysis may be applied to that parameter if the available data is suitable. Such analysis would include an assessment of the Normality of the distribution of the data, consideration of the presence of outliers, and the calculation of a UCL estimate of the mean.

Summary data is presented in the tables below and the laboratory analysis is included in Appendix C. The screening values and source notes are presented in Table 1 "Tier 1 Screening Values" at the front of Appendix C.

Soil Type: Made Ground

Contaminants	Units	No of Samples Tested	Range	Sample Mean	Open Space (Residential) Tier 1 Screening Values
Arsenic (As)	mg/kg	6	14 – 34	22.7	79
Cadmium (Cd)	mg/kg	6	<0.2 – 2.1	1.8	120
Trivalent Chromium (CrIII)*	mg/kg	6	29 – 47	36.7	1,500
Hexavalent Chromium (CrVI)	mg/kg	6	<1.8	<1.8	7.7
Lead (Pb)	mg/kg	6	170 – 820	496.7	630
Mercury (Hg)	mg/kg	6	0.7 – 1.3	1.0	40
Selenium (Se)	mg/kg	6	<1.0	<1.0	1,100
Nickel (Ni)	mg/kg	6	18 – 35	28.7	230
Copper (Cu)	mg/kg	6	51 – 160	105.8	12,000
Zinc (Zn)	mg/kg	6	120 – 680	368.3	81,000
Phenol	mg/kg	6	<1.0	<1.0	440-1300
Benzo(a)pyrene (BaP)	mg/kg	6	0.46 – 9.1	3.7	4.9

Contaminants	Units	No of Samples Tested	Range	Sample Mean	Open Space (Residential) Tier 1 Screening Values
Naphthalene	mg/kg	6	0.05 – 0.46	0.2	77-430+
Total PAH	mg/kg	6	4.71 – 86.5	39.30	/
Total Cyanide (CN)	mg/kg	6	<1.0	<1.0	/
Acidity (pH values)	/	6	7.9 – 9.6	8.4	/
Soil Organic Matter	%	6	2.6 – 5.4	3.7	/

* Assumed as Total Cr minus CrVI

Concentrations of lead (820mg/kg in HA02@0.3m & 700mg/kg in WLS04@0.5m) and benzo(a)pyrene (9.1mg/kg in WLS04@0.5m) were found above the tier 1 screening value. However, the average concentrations of these potential contaminants within the Made Ground across the site were below the tier 1 screening values.

Using the Contaminated Land Statistics Calculator to further analyse these results, the highest concentrations of lead (820mg/kg in HA02) and benzo(a)pyrene (9.1mg/kg in WLS04) cannot be considered outliers within the dataset. This means the 95th percentile confidence limit that the true mean concentrations of lead and benzo(a)pyrene are below their critical concentrations (tier 1 screening values) is not met, and therefore, the Made Ground should be considered contaminated with lead and benzo(a)pyrene.

Benzo(a)pyrene is used as a surrogate marker for all genotoxic PAH's, in line with HPA guidance Ref [13]. The test data has been compared with the concentration limits reported for the Culp study, as recommended by HPA, and is consistent with this approach. On the basis of the test results, the genotoxic PAH's in the sample from WLS04@0.5m, and on the basis of the above, throughout the Made Ground, would be considered to pose a potential risk to human health.

The measured concentrations of PAH's exceed the UKWIR threshold(s) for the use of plastic water supply pipes.

Soil Type: Natural Ground

Contaminants	Units	WLS02@0.1.5m	WLS03@0.80m	Open Space (Residential) Tier 1 Screening Values
Arsenic (As)	mg/kg	9.9	18	79
Cadmium (Cd)	mg/kg	<0.2	<0.2	120
Trivalent Chromium (CrIII)*	mg/kg	35	40	1,500
Hexavalent Chromium (CrVI)	mg/kg	<1.8	<1.8	7.7
Lead (Pb)	mg/kg	25	29	630
Mercury (Hg)	mg/kg	<0.3	<0.3	40
Selenium (Se)	mg/kg	<1.0	<1.0	1,100
Nickel (Ni)	mg/kg	17	24	230
Copper (Cu)	mg/kg	21	22	12,000
Zinc (Zn)	mg/kg	140	67	81,000
Phenol	mg/kg	<1.0	<1.0	440-1300

Contaminants	Units	WLS02@0.1.5m	WLS03@0.80m	Open Space (Residential) Tier 1 Screening Values
Benzo(a)pyrene (BaP)	mg/kg	<0.05	0.25	4.9
Naphthalene	mg/kg	<0.05	<0.05	77-430+
Total PAH	mg/kg	<0.80	2.15	/
Total Cyanide (CN)	mg/kg	<1.0	<1.0	/
Acidity (pH values)	/	8	7.6	/
Soil Organic Matter	%	1	0.9	/

* Assumed as Total Cr minus CrVI

The above samples of natural ground would be considered uncontaminated given the site's proposed end use.

14.3.2 Asbestos Containing Materials

No asbestos containing materials (ACM) were observed in the exploratory holes during the site works.

Six samples of Made Ground and two samples of natural ground from across the site were subject to analysis for asbestos. The results of this analysis are summarised in the following table.

Sample (Location & Depth)	Soil type	Presence & ID	Asbestos Quantification % (if required)
HA01 0.0-0.6m	Made Ground	Loose fibres of Chrysotile (white) asbestos	<0.001*
HA02 0.30m	Made Ground	Loose fibres of Chrysotile (white) asbestos	<0.001
WLS01 0.50m	Made Ground	None detected	/
WLS02 0.60m	Made Ground	Asbestos cement containing Chrysotile (white) asbestos	0.141
WLS02 1.50m	Natural Ground	None detected	/
WLS03 0.50m	Made Ground	None detected	/
WLS03 0.80m	Natural Ground	None detected	/
WLS04 0.50m	Made Ground	None detected	/

*<0.001% is the laboratory limit of detection.

Two of the samples recorded concentrations of loose asbestos fibres at less than the limit of detection. In the other sample, in which small pieces of asbestos cement were found, a concentration of 0.141% was found. This is just above the hazardous waste limit of 0.1%. This is discussed further in Section 18

It should be noted that the exploratory holes are of small size relative to the area investigated and the investigation was constrained by buildings and services. Therefore, the samples obtained may not reflect the full composition of the soils on the site, and there is always the potential for pockets of asbestos or for asbestos containing materials to be present, which have not been detected in the sampling.

14.3.3 Organic Contaminants

No visual or olfactory evidence of any potential petroleum hydrocarbon contamination was observed during the site works.

Two samples of Made Ground (HA02@0.3m and WLS03@0.5m) were subject to laboratory analysis for total petroleum hydrocarbons as part of the analysis required for preliminary waste classification. Only very low concentrations of petroleum hydrocarbons were recorded in these samples, These are not considered significant.

15 Site Investigation - Gas

15.1 Gas Sources

The Desk Study did not identify any potential gas sources, either on or in the vicinity of the site. However, ground gas monitoring undertaken by Land Science recorded elevated concentrations of both methane and carbon dioxide throughout the monitoring period, in an installation within the borehole on the southwest of the site.

Consultation by the client with the gas supplier identified a leaking gas main within the vicinity of this installation. It was considered likely that this was the source of the elevated concentrations of ground gases recorded. However, to confirm this, additional ground gas monitoring wells were constructed across the site, with a program of six fortnightly monitoring visits undertaken.

15.2 Sampling Strategy

The number and spacing of the gas monitoring wells was designed to provide general coverage for the proposed development.

It was also planned to include the monitoring well on the southwest of the site (BH02 previously installed by Land Science) in the monitoring program. However, this location had been lost due to works undertaken to repair the leaking gas main. Due to access constraints (the site topography, spoil resulting from the repair of the gas main and the location of the gas main itself, a new monitoring well could not be constructed in this area of the site.

15.3 Monitoring Programme and Results

The sensitivity of the proposed development is rated as Moderate and, therefore, 6No. gas readings over a period of 3 months (CIRIA C665 Ref [3], Table 5.5) are planned. To date, two of the monitoring visits have been completed. The results of the monitoring programme are given in full in Appendix D and are summarised below.

Borehole Gas Monitoring Results								
Monitoring well	WLS01		WLS02		WLS03		WLS04	
Response zone / Stratum	1.0 – 3.0m Silty CLAY		0.9 – 1.4m Made Ground 1.4 – 2.5m Silty CLAY 1.0		2.0 – 3.0m Silty CLAY 1.0		2.0 – 1.5m Made Ground 1.5 – 3.0m 3.0 Silty CLAY	
Evidence of contamination	None		None (Made Ground comprises concrete, brick etc.)		None		None (Made Ground comprises concrete, brick etc.)	
Date of visit	12/10/23	26/10/23	12/10/23	26/10/23	12/10/23	26/10/23	12/10/23	26/10/23*
Methane range CH ₄ (peak %)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	/

Borehole Gas Monitoring Results								
Carbon dioxide range CO ₂ (peak %)	3.5	3.1	2.3	2.7	0.7	0.2	0.4	/
Oxygen range O ₂ (lowest %)	17.7	16.7	18.5	17.2	19.9	20.1	19.8	/
Flow rate range l/hr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	/
BH differential pressure range (Pa)	0	0	0	0	0	0	0	/
PID measurement (ppm)	0.0	0.1	0.0	0.7	0.0	0.1	0.0	/
Water level (mbgl)	Dry	Dry	Dry	Dry	1.95	1.19	0.83	/
Atmospheric pressure during monitoring (mb)	1011	992	1011	990	1012	989	1013	/

**Borehole was full of water meaning monitoring could not be undertaken.*

To date two out of the six planned monitoring visits have been completed. No methane and only low concentrations of carbon dioxide have been recorded. On this basis, ground gas protection measures would not be required on site. However, a separate ground gas risk assessment report will be produced on completion of the scheduled monitoring visits.

16 Summary of Identified Contamination

The Made Ground on site contains elevated concentrations of lead and PAH. Loose fibres of asbestos, and in one location asbestos containing material (ACM) in the form of fragments of asbestos cement, have also been identified in the Made Ground within the landscaped mounds on the south of the site.

17 Risk Evaluation

The object of the risk evaluation is to assess the pollution linkages for specific contaminant groups considered in the conceptual model, identify any unacceptable risks and, therefore establish whether there is a need for further investigation and/or remedial action.

The risks are considered in the context of the specific development proposals for the site and, therefore, the conclusions may not be appropriate for alternative schemes.

17.1 Lead and PAH

Elevated concentration of lead and PAH have been identified within the Made Ground across the site.

The risk to future site users from the presence of this material can be dealt with by breaking the exposure pathway between them and the contaminated material. This could either be achieved by providing a capping layer to the existing Made Ground, or by removal of the Made Ground from proposed soft landscaped areas. Where the Made Ground is present beneath areas of proposed hardstanding and buildings, this would effectively break the exposure pathway. Given the height of the existing landscaped mounds, and the level of the surrounding area, it is assumed that the majority of this material will require removal from site to achieve finished levels.

The risk to site workers from elevated concentrations of lead and PAH can be mitigated by the adoption of good site hygiene practices (refraining from eating, drinking and smoking in the working area and minimising mud/dust within the onsite facilities). The presence of buildings and hardstanding will mitigate the risks to future site users, and therefore, remediation will only potentially be required within proposed soft landscaped areas.

The concentrations of PAH in the Made Ground may have implications for the materials used for the laying of new water mains. Guidance should be sought from the relevant services providers.

17.2 Asbestos

Loose fibres containing chrysotile (white) asbestos, and in one location pieces of asbestos containing cement, have been found within the Made Ground which forms the landscaped bunds on the south of the site. Where loose fibres have been identified, the concentration was <0.001% which is the laboratory limit of detection. Where pieces of asbestos cement were found in the sample (from WLS02) the concentration of asbestos by weight was 0.141%. There is no screening value for asbestos in terms of human health. However, the concentrations of loose fibres at less than the limit of detection would not be considered to pose a significant risk to human health. A concentration of 0.141% is above the threshold at which the material would be considered hazardous waste in terms of waste disposal. However, as the fibres are bound in a cement matrix, this will reduce the risk of potential fibre release and therefore, the potential risk to human health.

The risk to future site users can be dealt with as per the recommendations for lead and PAH, namely by breaking the exposure pathway by removal of the Made Ground and/or provision of a capping layer of clean soils.

In terms of the risk to site workers, the concentrations of asbestos identified to date would not be considered significant. However, a significant depth of Made Ground is present, both within the landscaped mounds and the parking area on the north of the site. Where bulk excavation works had previously been undertaken within the landscaped mound to repair the gas main on the southwest of the site, a pile of spoil containing lumps of concrete, brick, blacktop, paving slabs, glass, ash, etc. was present. It is likely that this material is from the demolition of the previous houses on the site. Given the nature and composition of this material, it is possible that it may contain pockets of asbestos containing material. A careful watch should therefore be kept during any excavation works, or removal of this material from site.

The risk to wider human receptors should also be considered, particularly as the site is bounded on two sides by housing. Dust should be kept to a minimum.

Should pockets of more significant asbestos contamination be identified during the redevelopment works, additional measures such as background air monitoring, may be required.

17.3 Revised Conceptual Model

The preliminary site model has been refined in light of the findings of this investigation and is summarised below.

Metals (Lead)	Non-metals	PAH	Petroleum Hydrocarbons	Land Gas	Asbestos	Pathways	Receptors
Y	N	Y	N	n/a	P	Ingestion/inhalation of contaminated soil & dust	Human Health
Y	N	Y	N	n/a	n/a	Dermal contact with contaminated soil & dust	
n/a	N	N	N	P	n/a	Inhalation of vapours or gases	
N	N	N	N	n/a	n/a	Uptake into edible fruit and vegetables	
N	N	N	N	n/a	n/a	Surface water run-off into surface water features	Water Environment

Metals (Lead)	Non-metals	PAH	Petroleum Hydrocarbons	Land Gas	Asbestos	Pathways	Receptors
N	N	N	N	n/a	n/a	Migration through ground into surface water or groundwater	
N	N	N	N	n/a	n/a	Off-site migration of contaminated groundwater	
Y	N	Y	N	n/a	n/a	Vegetation on site growing in contaminated soil	Flora and Fauna
n/a	n/a	n/a	n/a	n/a	n/a	Aquatic life in affected waters	
N	N	Y	N	n/a	n/a	Contact with contaminated soils	Building materials / buried services
n/a	n/a	N	N	P	n/a	Fire or explosion	

Key:

- Y Pollutant linkage likely
- N Pollutant linkage not likely
- P Pollutant linkage possible
- n/a Pathway not applicable to contaminant

17.4 Relevant Pollutant Linkages

A number of Relevant Pollutant Linkages for which remedial action will be required have been identified in the revised conceptual model, as follows.

Contaminant / Source	Pathways	Receptor
Lead and PAH's in Made Ground	Soil/dust dermal exposure	Site/construction workers Future residents
	Soil/dust ingestion/inhalation	Site/construction workers Future residents
	Plant uptake	Flora & fauna
	Direct contact	Buried services – plastic Pipes
Asbestos in Made Ground	Dust inhalation	Site/construction workers Future residents

Potential pollutant linkages have also been identified for ground gases. Monitoring is ongoing, with a final ground gas risk assessment report to be issued following completion of the final visit.

18 Soil Waste Management

18.1 Re-use of Soils

It is anticipated that the arisings from groundworks on this site will comprise Made Ground and natural soils.

Clean natural arisings from groundworks may be re-used on site without further testing, where there is a definite use for such materials, e.g. raising levels or construction of landscaping layers or bunds as set out in the approved plans for the development.

Treated contaminated soils may be reused on site under an appropriate Materials Management Plan, where certain criteria are met, in accordance with the CL:AIRE Definition of Waste Code of Practice, Ref [14].

18.2 Disposal of Soils

Some soils will require removal from site and disposal to suitably licensed landfills. Different guidelines and charges will apply to different waste classifications. As waste producers, the Developer holds responsibilities under the various governing regulations, particularly the Waste Duty of Care Code of Practice under the Environmental Protection Act 1990, Ref [15].

The chemical analyses appended to this report can be used to inform the initial classification of the soils as either Hazardous or Non-Hazardous, and derive the appropriate EWC code, for offsite disposal or transfer. Waste Acceptance Criteria (WAC) testing may be needed for confirmation of the material's classification, and will be required to demonstrate an inert classification.

There are strict requirements in place for the accurate description of wastes using EWC codes and, therefore, it is essential that materials that would be given different descriptions (e.g. blacktop, Made Ground and natural soils), as well as those with different classifications, are carefully segregated during excavation and storage on site. This will also ensure the most cost effective disposal. Mixing these materials can give rise to significant difficulties in disposal and also substantially increase costs.

Soil arisings may be transferred to other development sites under a Materials Management Plan, where certain criteria are met, in accordance with the CL:AIRE Definition of Waste Code of Practice Ref [14].

All soils leaving site will need to be pre-treated. Waste minimisation by selective excavation is a recognised form of pre-treatment.

The Landfill Directive, introduced to the UK via the Landfill Regulations (England and Wales) 2002 aims to reduce reliance on landfill as a disposal option. The Regulations include updated Waste Acceptance Criteria (WAC) as limit values for waste destined to various classes of landfill. The developer has a statutory responsibility under the Duty of Care Regulations of the Environmental Protection Act 1990 to ensure that contaminated soil and water is disposed of offsite to a suitably licensed waste management facility in a safe and approved manner.

To comply with the Duty of Care, all wastes taken off site, in solid or liquid form, must be handled by a registered waste carrier and be accompanied by a consignment note that describes the waste.

19 Preliminary Waste Classification and WAC Analysis

If arisings from the constructions works are intended for disposal, then there is a requirement to determine prior to disposal whether these would classify as:

- Hazardous
- Non hazardous

The current relevant waste legislation and technical guidance (WM3 1st edition ver. 1.2GB 2021) on the assessment and classification of hazardous waste, sets out the requirement for classification and provides the basis for the methodology employed to ensure compliance with the regulations. This report sets out to fulfil the requirements of basic characterisation.

Waste classification indicates whether the material is hazardous or non-hazardous. If material is classified as non-hazardous, there is a choice of sending the material to a non-hazardous or an inert landfill (subject to meeting inert waste acceptance levels based on WAC analysis). Where the waste is classified as hazardous, WAC analysis will be required to demonstrate that the concentrations meet the acceptance levels for hazardous landfill or stable non-reactive hazardous (SNRH) landfill.

The List of Wastes (England) Regulations 2005 shows those wastes that are absolute entries (i.e. hazardous waste regardless of their concentration) and mirror entries (hazardous waste only if hazardous substances are present above the specified threshold concentrations). Section 17 of the List of Wastes relates to Construction and Demolition Wastes (including Excavated Soil from Contaminated Sites, stones and dredging spoil). Contaminated soil is a "mirror entry", and is not automatically assigned a hazardous or non-hazardous nature.

Instead, an assessment of the composition of the soil is undertaken to determine the concentrations of hazardous substances, and the waste classified accordingly. The assessment of contaminated soil to determine whether it is hazardous waste is dependent on the presence of "hazardous substances" exceeding particular thresholds.

Results of the Preliminary Assessment

The waste classification assessment has been undertaken using the results of the chemical analyses on the samples analysed. The classification of the materials was conducted using the concentration of each identified substance attributed to its 'worst-case' compound (where relevant), as per Environment Agency (EA) document WM3 (2015) and The Classification, Labelling and Packaging of Substances and Mixtures Regulation 1272/2008 (CLP). The assessment was carried out using the HazWaste Online Toolkit together with Tables 3.1 and 3.2 of CLP Regulation. The details of the waste classification are presented in Appendix E.

The results of the chemical analysis carried out indicate that the recorded concentrations for asbestos, PAHs, metals and TPH in the soils were generally low.

No visible asbestos containing materials (ACM's) were recorded during the site investigation. However, loose asbestos fibres, and in one sample pieces of asbestos cement, were identified in the samples subject to laboratory analysis.

A summary of the assessment results is presented below:

Sample ID	Material	Classification	EWC	Hazardous Properties
HA02@0.3m	Made Ground (landscaped mounds)	Non-Hazardous	17 05 04	n/a
WLS03@0.5m	Made Ground	Non-Hazardous	17 05 04	n/a

Based on the results of the chemical analysis, the Made Ground soils on site would be classified as Non-Hazardous with EWC code 17 05 04.

Results of Waste Acceptance Criteria (WAC) Analysis

Waste Acceptance Criteria Analysis was carried out on two samples of Made Ground – HA02@0.3m & WLS03@0.5m.

The results of the WAC analysis carried out on the samples of Made Ground indicate that the recorded concentrations of parameters analysed would meet an INERT landfill acceptance criteria.

20 Recommendations

The chemical analyses undertaken in the course of this investigation have been used to carry out a preliminary waste classification of the materials on site. This report should be forwarded to waste receiving sites for their final decision. Additional testing and Waste Acceptance Criteria (WAC) testing may be needed for confirmation of material's classification.

If more significant contamination is encountered during the construction works, even following remediation, this may affect the waste classification.

It should be noted that where the concentration of asbestos in the soil is greater than 0.1% and/or pieces of asbestos containing material visible to the naked eye can be identified, the soil is classified as hazardous waste.

Laboratory analysis identified pieces of asbestos cement in the sample from WLS02@0.6m. However, no pieces of asbestos containing material which were visible to the naked eye were observed on site, the asbestos cement only being identifiable in the laboratory. Therefore, it would be prudent to submit the laboratory test results to the hauler or potential receiving waste site, to ascertain how they would classify this material.

Where the concentration of asbestos in the soil is less than 0.001%, it will be classified as per any other material, with the waste classification depending on the full range of potential contaminants.

21 Discussion and Conclusions

The site is to be redeveloped with a part-3 and part-6 storey building, comprising 44 no. one bedroom affordable residential units, with amenity space and site landscaping including new publicly accessible pedestrian routes and tree planting.

The shallow soils on site comprise Made Ground, which within the landscaped bunds on the south of the site, is up to 2m deep. These soils have been found to contain elevated concentrations of lead and PAH. Loose fibres of asbestos, and in one location asbestos containing material (ACM) in the form of fragments of asbestos cement, have also been identified. These findings are in keeping with the findings of the previous intrusive works by Pell Frischmann /Land Science.

Given the footprint of the new proposed building, it is assumed that the majority of the Made Ground within the landscaped bunds will be removed from site in order to facilitate its redevelopment. Where Made Ground remains within proposed soft landscaped areas, this will require either removal or capping with clean soils in order to protect future site residents.

On the basis of the concentrations of Lead a capping layer of 300mm thickness would be required. However, the concentrations of PAH found would require a 380mm depth of capping. Alternatively, a 300mm capping layer, with a deter-to-dig membrane could be provided. Calculation sheets for the depth of the capping layers are given in Appendix C.

From the proposed landscaping plan for the development (see Figure 2b in Appendix A), the majority of the planted areas require a depth of imported clean soils in excess of the cover depths calculated above. However, only a 200mm depth of topsoil is shown as being required across the lawn area. If this is due to the presence of the existing trees, and restrictions on excavation around their roots, discussions would need to be had with both the Contaminated Land Officer at Haringey Council and the Arboricultural Consultant for the development to determine a way forward. It may be that geocell membrane filled with topsoil could be used to create a deter-to-dig membrane, thereby allowing the reduction of the capping layer to 200mm in the lawn areas.

During the removal of the Made Ground, and groundworks phases of the redevelopment, a careful watch for pockets of ACM should be kept. The risk to wider human receptors should also be considered, particularly as the site is bounded on two sides by housing. Dust should be kept to a minimum.

Where Made Ground remains where new services are to be laid, clean corridors should be constructed.

Potential pollutant linkages have also been identified for ground gases. Monitoring is ongoing, with a final ground gas risk assessment report to be issued following completion of the final visit.

As with any site, areas of contamination not identified during site investigation works may come to light in the course of redevelopment. Accordingly, a discovery strategy must be in place during the redevelopment to ensure that any hitherto unknown contamination is identified and dealt with in an appropriate manner. Depending on the nature of any such contamination, it may prove necessary to reassess the remedial strategy for the site.

A formal remediation strategy and verification plan should be agreed with the regulatory authorities prior to commencement of any remedial works.

The existing monitoring wells on the site should be decommissioned, to prevent the upward migration of gas/downward migration of contamination to the groundwater.

22 General Guidance

Allowance should be made for experienced verification of any remedial works.

It may be that specific local requirements apply to this site, of which we are not aware at this time.

In general terms, the workforce and general public should be protected from contact with contaminated material. There is a range of relevant documents published by the Health and Safety Executive, and organisations such as CIRIA, and the BRE.

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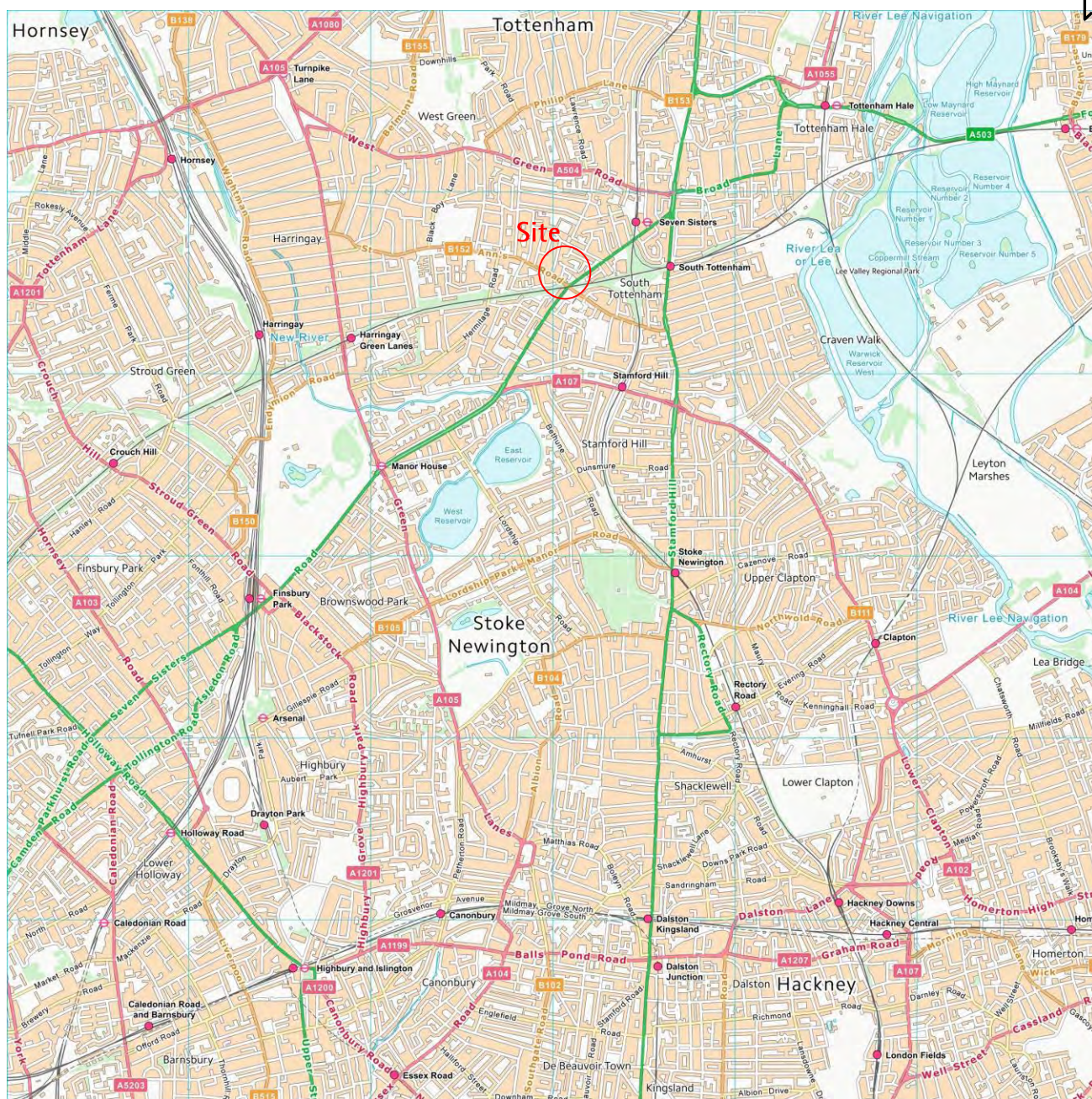
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APPENDIX A

Site Plans and Exploratory Hole Logs





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Site: Kerswell Close, London, N15 5HT

STL: J15567

Fig No: 1 – Site Location

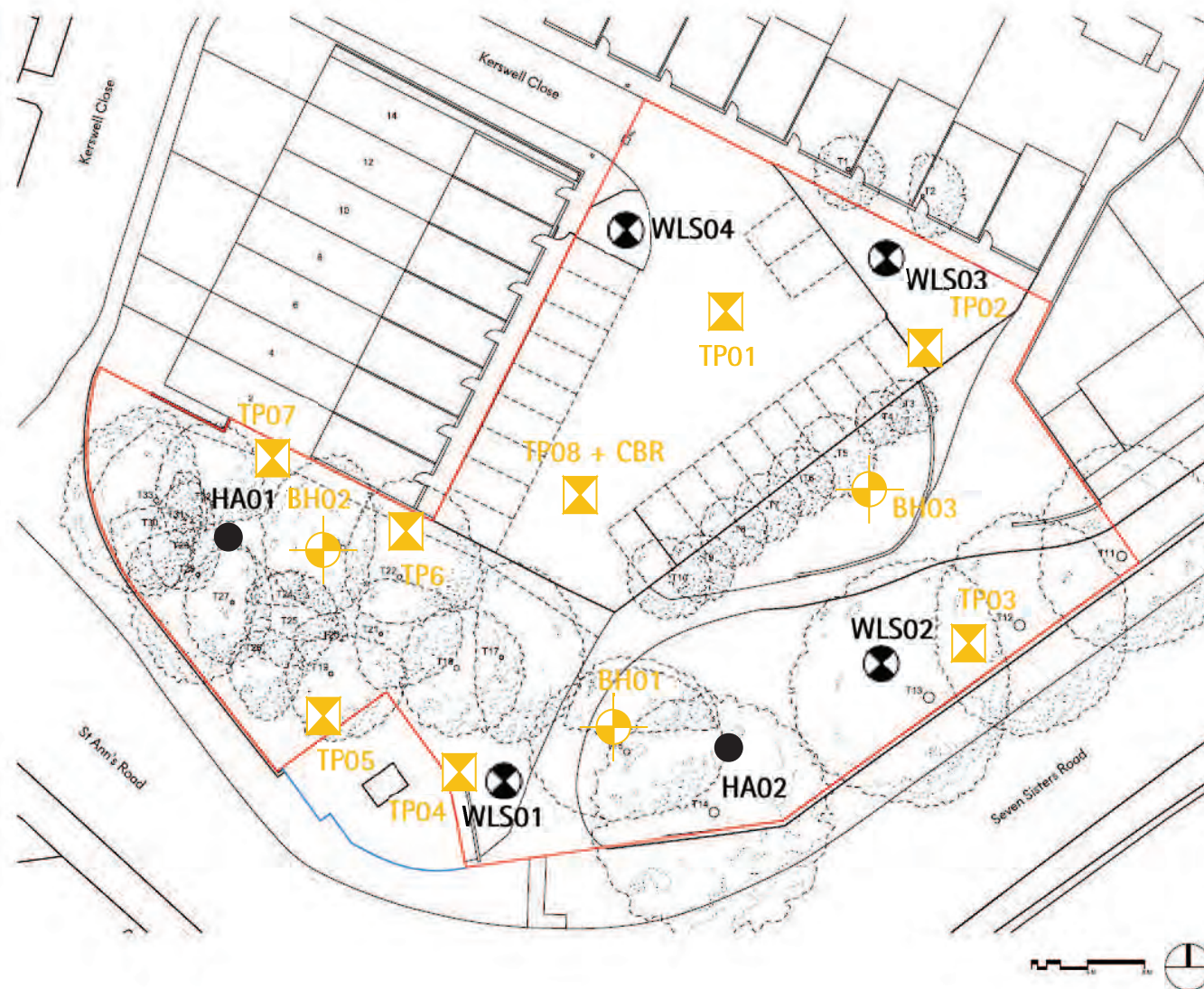
Date: 06 November 2023

Not to scale



Southern Testing: Keeble House, Stuart Way, East Grinstead, West Sussex RH19 4QA
ST Consult: Twigden Barns, Brixworth Road, Creton, Northampton NN6 8NN





Do not scale from this drawing, use figure dimensions only.
 Please check dimensions in millimetres, all levels in plan & section.
 This drawing and the works indicated are the copyright of this practice and may not be reproduced except by written permission.

This drawing must be printed in colour.

— Site boundary
 — Ownership boundary
 T# Tree number

Land Science boreholes & trial pits (2021)
 Southern Testing windowless sampler boreholes & hand dug pits (2023)

Kerswell Close

Existing ground floor
 166_HAT_PL_010
 Status: Planning
 Revision: 01
 Date: 18/11/2018
 Scale: 1:250@A3

HAT Projects

Tribble Works, 24 Tribble Street,
 Colchester, Essex, CO1 1UN
 T: 0206 760 888
 kerswell@hathprojects.com

NB: Positions of Boreholes and/or Trial Pits are only indicative unless dimensioned

Site: Kerswell Close, London, N15 5HT

Date: 17 October 2023

STL: J15567

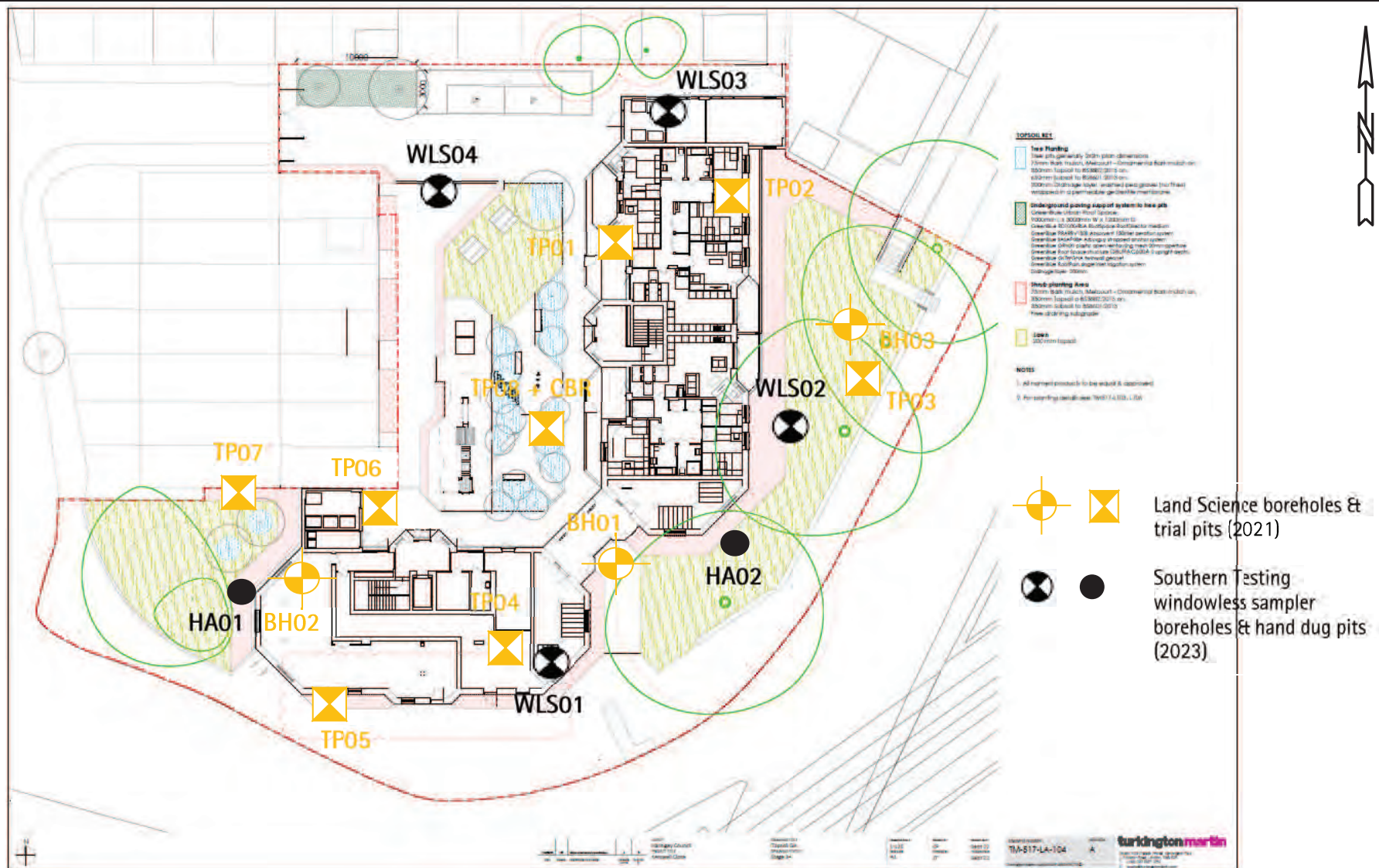
Fig No: 2a

Trial Hole Locations – Existing Site Layout

Southern Testing

Southern Testing: Keeble House, Stuart Way, East Grinstead, West Sussex RH19 4QA
 ST Consult: Twigden Barns, Brixworth Road, Creaton, Northampton NN6 8NN

ST Consult



NB: Positions of Boreholes and/or Trial Pits are only indicative unless dimensioned

Site: Kerswell Close, London, N15 5HT

Date: 17 October 2023

STL: J15567

Fig No: 2b

Trial Hole Locations – Proposed Site Layout

 Southern Testing

Southern Testing: Keeble House, Stuart Way, East Grinstead, West Sussex RH19 4QA
ST Consult: Twicken Barns, Brixworth Road, Creton, Northampton NN6 8NN

 ST Consult

Key to Exploratory Hole Logs, Plans and Sections

Backfill Symbols		Pipe Symbols		Principal Soil Types		Principal Rock Types		Drilling Records	
Arisings		Plain Pipe		Topsoil		Mudstone		Water Strike	
Concrete		Slotted Pipe		Made Ground		Claystone		Depth Water Rose	
Blacktop		Piezometer		Clay		Siltstone		Total Core Recovery (%) [TCR]	
Bentonite		Piezometer Tip		Silt		Sandstone		Solid Core Recovery (%) [SCR]	
Gravel Filter		Filter Tip		Sand		Limestone		Rock Quality Index (%) RQD]	
Sand Filter		Extensometer		Gravel		Chalk		Fracture Index (fractures / m) [FI]	
		Inclinometers		Peat					

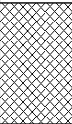
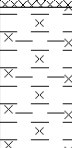
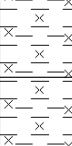
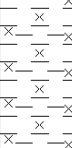
All soil and rock descriptions are in general accordance with BS5930 2015, BS EN ISO 14688-1:2002+A1:2013 and BS EN ISO 14689-1:2003. Chalk descriptions are also based on CIRIA C574 and "Logging the Chalk – R.N. Mortimer 2015". The Geology Code is only provided where a positive identification of the sample strata has been made.

Location / Method Identifiers		In-situ Test Location / Method	
BH	Borehole (undefined)	DP	Dynamic Probe
CP	Cable Percussive	CPT	Cone Penetration Test
RC	Rotary Core	CBR	In-situ CBR Test
RO	Rotary Open Hole	DCP	CBR using Dynamic Cone Penetrometer
ODC	Rotary Odex/Symmetrix drilling cased	CBRT	CBR using TRL Probe
CP+RC	Cable Percussive to Rotary Core	PB	Plate Bearing Test
SNC	Sonic	SPT (S)	Standard Penetration Test (Split Barrel Sampler)
CFA	Continuous Flight Auger	SPT (C)	Standard Penetration Test (Solid Cone)
FA	Flight Auger	N	SPT Result
VC	Vibro Core	-/-	Blows/Penetration (mm) after seating drive
WLS+RC	Windowless (Dynamic) Sampler to Rotary Core	-*/-	Total Blows / Penetration (mm)
WLS	Windowless Sampler	()	Extrapolated Value
WS	Window Sampler	PPT	Perth Penetration (In-House Method - Equivalent N Value)
HA	Hand Auger	HP / UCS	Strength from Hand Penetrometer (kN/m ²)
C	Road / Pavement Core	IVN	Strength from Hand Vane ((kN/m ²) P = peak, R = residual
IP	Inspection Pit (Hand Excavation)	PID	Photo Ionisation Detector (ppm)
TP	Trial Pit (Machine Excavated)	MEXE	Mexi-Cone CBR (%)
OP	Observation Pit (Supported Excavation Hand or Machine)		

Samples / Test Type	
B	Bulk Sample
BLK	Block Sample
C	Core Sample
CBRS	CBR Mould Sample
D	Small Disturbed Sample
ES	Environmental Sample (Soil)
EW	Environmental Sample (Water)
GS	Environmental Sample (Gas)

Samples / Test Type	
SPTLS	Standard Penetration Test Split Barrel Sample
TW	Thin Wall Push In Sample (e.g. Shelby Sampler)
U	Undisturbed Open Drive Sample (blows to take)
UT	Thin Wall Undisturbed Open Drive Sample (blows to take)
W	Water Sample (Geotechnical)
SP	Sample from Stockpile
P	Piston Sample
AMAL	Amalgamated Sample

						Start - End Date:		Project ID:		Hole Type:		HA02	
						03/10/2023		J15567		HA		Sheet 1 of 1	
Client:		Selsdon Building Contractors Limited					Co-ordinates:		Level (m AOD)		Logger:		
											SKT		
Project Name:		Kerswell Close					Location:		Tottenham, London, N15 5HT				
Well	Water Strikes	Samples and Insitu Testing			Progress		Depth (m)	Level (m AOD)	Legend	Stratum Description			
		Depth (m)	Type/Fl	Results	Window Run								
		0.30	ES			1.00	(1.00)			Friable brown silty sand with frequent medium to coarse gravel of flint, brick, concrete, mortar and rare textile. MADE GROUND			
										End of Borehole at 1.00m		1	
												2	
Remarks:													
Stable													
Status:		FINAL			Log Print Date and Time:		05/10/2023 03:25		Log Approved By:				

				Start - End Date:		Project ID:		Hole Type:		WLS01	
				03/10/2023		J15567		WLS		Sheet 1 of 1	
Client:		Selsdon Building Contractors Limited				Co-ordinates:		Level (m AOD)		Logger:	
										SKT	
Project Name:		Kerswell Close				Location:		Tottenham, London, N15 5HT			
Well	Water Strikes	Samples and Insitu Testing			Progress		Depth (m)	Level (m AOD)	Legend	Stratum Description	
		Depth (m)	Type/Fl	Results	Window Run						
		0.50	ES			0.40	(0.40)		Mid grey-brown silty sand with fine to medium, occasionally coarse flint, concrete and rare brick. MADE GROUND		
									Desiccated mid brown silty clay with rare medium brick, flint and concrete cobbles. REWORKED GROUND		
		1.00	SPT	N=8 (1,2/1,2,2,3)		0.90			Desiccated mid brown silty CLAY with fine rootlets and rare yellow-orange silty partings.		
		1.50	HP	UCS(kPa)=600			(1.20)				
		2.00	HP SPT	UCS(kPa)=250 N=11 (1,1/2,2,3,4)		2.10			Stiff mid brown with grey-blue mottling, silty CLAY.		
							(0.90)		Selenite crystals at 2.7m		
					3.00		End of Borehole at 3.00m				
Remarks:											
Stable											
Status:		FINAL		Log Print Date and Time:		05/10/2023 03:25		Log Approved By:			

	Start - End Date:	Project ID:	Hole Type:	WLS01
	03/10/2023	J15567	WLS	Sheet 1 of 1

Depth Related Hole Information									
Top Depth (m)	Base Depth (m)	Hole Type	Start Date	End Date	Crew	Plant Used	Contractor	Logged By	Remarks
0.00	3.00	WLS				Premier Rig		SKT	

Hole Diameter			Casing Diameter		
Hole Diameter (mm)	Depth to Base (m)	Remarks	Casing Diameter (mm)	Depth to Base (m)	Remarks

Dynamic Sample Drill Run Information						
Run No.	Top Depth (m)	Base Depth (m)	Duration	Hole Diameter (mm)	Sample Recovery (%)	Remarks

Project Specific Time Related Remarks				Drilling Progress by Time				
Date Time Start	Date Time End	Duration	Remarks	Date Time	Depth (m)	Casing Depth (m)	Water Depth (m)	Remarks

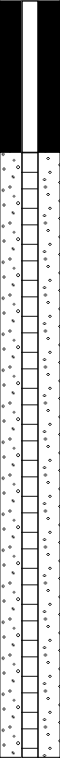
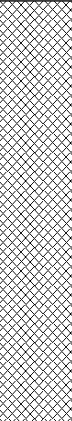
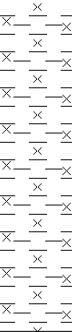
SPT								
Top Depth (m)	Test Type	Casing Depth (m)	Water Depth (m)	Self Weight Penetration (mm)	Reported Result (N Value)	Hammer Serial No.	Energy Ratio %	Remarks
1.00 2.00	S S				N=8 (1,2/1,2,2,3) N=11 (1,1/2,2,3,4)			

Water Strikes and Details							
Depth Strike (m)	Date Time	Depth Casing (m)	Depth Sealed (m)	Remarks	Time Elapsed (mins)	Water Depth (m)	Remarks

Installation Details						Pipe Construction				
Distance	Point Ref.	Type	Top of Response Zone (m)	Base of Response Zone (m)	Pipe Ref.	Pipe Reference	Depth Top (m)	Depth Base (m)	Diameter (mm)	Pipe Type
3.00	1	SP			1	1 1	0.00 1.00	1.00 3.00		PLAIN SLOTTED

Backfill Details			
Depth Top	Depth Base	Material	Remarks
0.00 1.00	1.00 3.00	Bentonite Gravel Backfill	

Status:	FINAL	Log Print Date and Time:	05/10/2023 03:25	Log Approved By:	
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						Start - End Date:		Project ID:		Hole Type:		WLS02	
						03/10/2023		J15567		WLS		Sheet 1 of 1	
Client:		Selsdon Building Contractors Limited					Co-ordinates:		Level (m AOD)		Logger:		
											SKT		
Project Name:		Kerswell Close					Location:		Tottenham, London, N15 5HT				
Well	Water Strikes	Samples and Insitu Testing			Progress		Depth (m)	Level (m AOD)	Legend	Stratum Description			
		Depth (m)	Type/Fl	Results	Window Run								
		0.60	ES				(1.40)		Grey-brown silty sandy gravel of medium to coarse concrete, brick, flint, rare clinker and cobbles of concrete. MADE GROUND	1			
		1.50	ES			1.40		Hard orange-brown mottled red-orange and dark brown silty CLAY.	2				
		1.80	HP	UCS(kPa)=600									
		2.00	SPT	N=11 (2,3/2,2,3,4)				2.50		End of Borehole at 2.50m	3		
									4				
										5			
Remarks:													
Stable													
Status:		FINAL		Log Print Date and Time:		05/10/2023 03:25		Log Approved By:					

	Start - End Date:	Project ID:	Hole Type:	WLS02
	03/10/2023	J15567	WLS	Sheet 1 of 1

Depth Related Hole Information									
Top Depth (m)	Base Depth (m)	Hole Type	Start Date	End Date	Crew	Plant Used	Contractor	Logged By	Remarks
0.00	2.50	WLS				Premier Rig		SKT	

Hole Diameter			Casing Diameter		
Hole Diameter (mm)	Depth to Base (m)	Remarks	Casing Diameter (mm)	Depth to Base (m)	Remarks

Dynamic Sample Drill Run Information						
Run No.	Top Depth (m)	Base Depth (m)	Duration	Hole Diameter (mm)	Sample Recovery (%)	Remarks

Project Specific Time Related Remarks				Drilling Progress by Time				
Date Time Start	Date Time End	Duration	Remarks	Date Time	Depth (m)	Casing Depth (m)	Water Depth (m)	Remarks

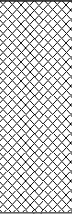
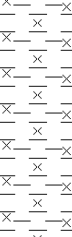
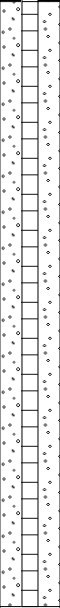
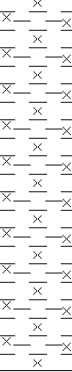
SPT								
Top Depth (m)	Test Type	Casing Depth (m)	Water Depth (m)	Self Weight Penetration (mm)	Reported Result (N Value)	Hammer Serial No.	Energy Ratio %	Remarks
2.00	S				N=11 (2,3/2,2,3,4)			

Water Strikes and Details							
Depth Strike (m)	Date Time	Depth Casing (m)	Depth Sealed (m)	Remarks	Time Elapsed (mins)	Water Depth (m)	Remarks

Installation Details						Pipe Construction				
Distance	Point Ref.	Type	Top of Response Zone (m)	Base of Response Zone (m)	Pipe Ref.	Pipe Reference	Depth Top (m)	Depth Base (m)	Diameter (mm)	Pipe Type
3.00	1	SP			1	1	0.00 0.50	0.50 2.50		PLAIN SLOTTED

Backfill Details			
Depth Top	Depth Base	Material	Remarks
0.00 0.50	0.50 2.50	Bentonite Gravel Backfill	

Status:	FINAL	Log Print Date and Time:	05/10/2023 03:25	Log Approved By:	
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						Start - End Date:		Project ID:		Hole Type:		WLS03	
						03/10/2023		J15567		WLS		Sheet 1 of 1	
Client:		Selsdon Building Contractors Limited					Co-ordinates:		Level (m AOD)		Logger:		
											SKT		
Project Name:		Kerswell Close					Location:		Tottenham, London, N15 5HT				
Well	Water Strikes	Samples and Insitu Testing			Progress		Depth (m)	Level (m AOD)	Legend	Stratum Description			
		Depth (m)	Type/Fl	Results	Window Run								
		0.50	ES			0.70	(0.70)		Friable brown silty clay with frequent fine to occasional coarse gravel of brick, flint, concrete, rare glass, clinker and brick cobbles. MADE GROUND		1		
		0.80	ES						Stiff brown silty CLAY with occasional yellow silty mottling and blue-grey patches.				
		1.00	SPT	N=4 (1,0/1,1,1,1)		2.30	(2.30)				2		
		1.50	HP	UCS(kPa)=200									
		2.50	HP	UCS(kPa)=300		3.00			End of Borehole at 3.00m		3		
		3.00	SPT	N=10 (1,0/1,2,3,4)									
Remarks:													
Stable													
Status:		FINAL		Log Print Date and Time:		05/10/2023 03:25		Log Approved By:					

	Start - End Date:	Project ID:	Hole Type:	WLS03
	03/10/2023	J15567	WLS	Sheet 1 of 1

Depth Related Hole Information									
Top Depth (m)	Base Depth (m)	Hole Type	Start Date	End Date	Crew	Plant Used	Contractor	Logged By	Remarks
0.00	3.00	WLS				Premier Rig		SKT	

Hole Diameter			Casing Diameter		
Hole Diameter (mm)	Depth to Base (m)	Remarks	Casing Diameter (mm)	Depth to Base (m)	Remarks

Dynamic Sample Drill Run Information						
Run No.	Top Depth (m)	Base Depth (m)	Duration	Hole Diameter (mm)	Sample Recovery (%)	Remarks

Project Specific Time Related Remarks				Drilling Progress by Time				
Date Time Start	Date Time End	Duration	Remarks	Date Time	Depth (m)	Casing Depth (m)	Water Depth (m)	Remarks

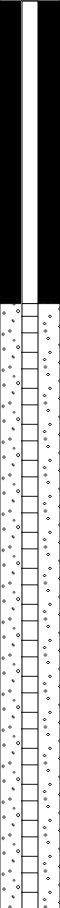
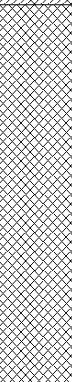
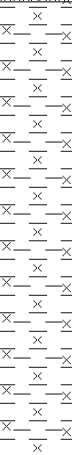
SPT								
Top Depth (m)	Test Type	Casing Depth (m)	Water Depth (m)	Self Weight Penetration (mm)	Reported Result (N Value)	Hammer Serial No.	Energy Ratio %	Remarks
1.00 3.00	S S				N=4 (1,0/1,1,1,1) N=10 (1,0/1,2,3,4)			

Water Strikes and Details							
Depth Strike (m)	Date Time	Depth Casing (m)	Depth Sealed (m)	Remarks	Time Elapsed (mins)	Water Depth (m)	Remarks

Installation Details						Pipe Construction				
Distance	Point Ref.	Type	Top of Response Zone (m)	Base of Response Zone (m)	Pipe Ref.	Pipe Reference	Depth Top (m)	Depth Base (m)	Diameter (mm)	Pipe Type
0.00	1	SP			1	1 1	0.00 1.00	1.00 3.00		PLAIN SLOTTED

Backfill Details			
Depth Top	Depth Base	Material	Remarks
0.00 1.00	1.00 3.00	Bentonite Gravel Backfill	

Status:	FINAL	Log Print Date and Time:	05/10/2023 03:25	Log Approved By:	
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						Start - End Date:		Project ID:		Hole Type:		WLS04	
						03/10/2023		J15567		WLS		Sheet 1 of 1	
Client:		Selsdon Building Contractors Limited					Co-ordinates:		Level (m AOD)		Logger:		
											SKT		
Project Name:		Kerswell Close					Location:		Tottenham, London, N15 5HT				
Well	Water Strikes	Samples and Insitu Testing			Progress		Depth (m)	Level (m AOD)	Legend	Stratum Description			
		Depth (m)	Type/Fl	Results	Window Run								
		0.50	ES			0.25	(0.25)		Dark brown silty CLAY (Topsoil).		1		
	Cobbles and gravel of brick and concrete in a dark brown silty clay matrix. MADE GROUND												
		1.80	HP	UCS(kPa)=230		1.50	(1.25)		Stiff mid brown silty CLAY with rare blue-grey mottling.		2		
									SPT	N=6 (1,0/1,1,2,2)			
												2.50	HP
	3.00	HP	UCS(kPa)=250	3.00	(1.50)		Yellow-orange silty partings from 2.2-3.0m.		3				
									End of Borehole at 3.00m		4		
											5		
Remarks:													
Made Ground was unstable. Backfilled to 2.65m bgl. on completion.													
Status:		FINAL			Log Print Date and Time:		05/10/2023 03:25		Log Approved By:				

	Start - End Date:	Project ID:	Hole Type:	WLS04
	03/10/2023	J15567	WLS	Sheet 1 of 1

Depth Related Hole Information									
Top Depth (m)	Base Depth (m)	Hole Type	Start Date	End Date	Crew	Plant Used	Contractor	Logged By	Remarks
0.00	3.00	WLS				Premier Rig		SKT	

Hole Diameter			Casing Diameter		
Hole Diameter (mm)	Depth to Base (m)	Remarks	Casing Diameter (mm)	Depth to Base (m)	Remarks

Dynamic Sample Drill Run Information						
Run No.	Top Depth (m)	Base Depth (m)	Duration	Hole Diameter (mm)	Sample Recovery (%)	Remarks

Project Specific Time Related Remarks				Drilling Progress by Time				
Date Time Start	Date Time End	Duration	Remarks	Date Time	Depth (m)	Casing Depth (m)	Water Depth (m)	Remarks

SPT								
Top Depth (m)	Test Type	Casing Depth (m)	Water Depth (m)	Self Weight Penetration (mm)	Reported Result (N Value)	Hammer Serial No.	Energy Ratio %	Remarks
2.00	S				N=6 (1,0/1,1,2,2)			

Water Strikes and Details							
Depth Strike (m)	Date Time	Depth Casing (m)	Depth Sealed (m)	Remarks	Time Elapsed (mins)	Water Depth (m)	Remarks

Installation Details						Pipe Construction				
Distance	Point Ref.	Type	Top of Response Zone (m)	Base of Response Zone (m)	Pipe Ref.	Pipe Reference	Depth Top (m)	Depth Base (m)	Diameter (mm)	Pipe Type
0.00	1	SP			1	1	0.00	1.00		PLAIN SLOTTED

Backfill Details			
Depth Top	Depth Base	Material	Remarks
0.00 1.00	1.00 3.00	Bentonite Gravel Backfill	

Status:	FINAL	Log Print Date and Time:	05/10/2023 03:25	Log Approved By:	
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APPENDIX B

Field Sampling and In-Situ Test Methods and Results



B

Soil and Rock Descriptions

All soil and rock descriptions are in general accordance with BS5930 Ref [4].

Anthropogenic soils ('Made Ground' or 'fill') describe materials which have been placed by man and can be divided into those composed of reworked natural soils and those composed of or containing man-made materials. 'Fill' is used to describe material placed in a controlled manner and 'Made Ground' is used to describe materials placed without strict engineering control.

The classification of materials such as topsoil is based on visual description only and should not be interpreted to mean that the material complies with criteria used in BS 3882 Ref [16].

Chalk descriptions are based on CIRIA C574 Ref [17] and Mortimore Ref [18].

The geology code is only provided on logs where a positive identification of the sample strata has been made.

Inspection Pit

Inspection pits are hand excavated from the surface (maximum depth 1.2 – 1.5m) using appropriate tools to locate and avoid existing buried services at exploratory hole positions. They are also regularly used as part of investigations on existing structures to expose and determine foundation detail.

Dynamic Sampling - Window or Windowless

Window sampling is carried out by driving hollow steel tubes incorporating a longitudinal access slot (window) and a cutting shoe into the ground using a percussive 'breaker'. This enables recovery of a continuous soil sample for examination and sub-sampling.

Windowless samplers are designed for taking disturbed, continuous soil samples to depths up to 10 metres (depending on ground conditions). The samplers comprise steel tubes of about 50-100mm diameter with a rigid plastic liner (no window) and are driven into the ground with a sliding hammer mounted on a tracked purpose-designed soil sampling rig. After driving and extracting the sampler from the ground, the plastic liner is extracted together with the enclosed soil sample. The sample can then either be extracted, split and sub-sampled or plastic end caps may be fitted, the tube labelled and transported for future examination and sub-sampling.

Soil samples are disturbed by the driving process with both techniques and can be regarded as being between Class 5 up to Class 3 samples at best (in favourable ground).

The major advantage of using windowless samplers is that the plastic liner greatly reduces the possibility of cross-contamination between successive samples.

An equivalent in-situ test to the Standard Penetration Test can be carried out with the windowless sampler rig.

Standard Penetration Test (SPT)

The Standard Penetration Test (SPT) is specified in BS EN ISO 22476-3 Ref [19]. In this test, an open-ended tube is driven into the ground by blows from a free-falling hammer (with specified sizes, weights and distances).

The tube is seated by driving to a penetration of 150mm, or by 25 blows, whichever occurs first. It is then driven for a maximum of a further 300mm and the number of blows is termed the penetration resistance (N). If 300mm penetration cannot be achieved in 50 blows, the test drive is terminated and penetration depth is recorded.

When testing in gravels, a conical end piece is attached to the tube. The test is then called an SPT(C).

A classification of relative density descriptions as used on borehole logs, based upon uncorrected SPT N values, is given within BS5930 Ref [4] and set out as follows:

Classification based on uncorrected SPT N Value	Term
0 - 4	Very Loose
4 - 10	Loose
10 - 30	Medium Dense
30 - 50	Dense
Over 50	Very Dense

Hand Penetrometer Test

The handheld soil penetrometer consists of a spring loaded and calibrated plunger which is forced into cohesive soil. A reading of unconfined compression strength (equal to twice cohesion) is given on a calibrated scale. The average of a set of three readings shall be recorded.

In common with other hand methods of strength assessment it does not give an accurate indication of bearing capacity in stiff or fissured soils, because of the small test area.

Disturbed Samples

Disturbed samples were taken from exploratory holes in general accordance with BS 5930 [4] and BS EN ISO 22475-1 Ref [20] as required and stored in appropriately labelled containers. Details of the type, size and depth of sample will be recorded within the exploratory hole record. Such samples can be regarded as being between Class 5 up to Class 3 quality depending upon their method of sampling.

Environmental Samples

Environmental samples were taken from the boreholes at regular intervals in the Made Ground and natural soils as indicated on the exploratory hole logs. The sampling strategy was in general accordance with BS10175 Ref [5] and BS ISO 18400 Refs [21], [22], [23], [24] & [25].

These samples were collected and stored in glass jars or plastic pots and transferred to the laboratory in cool boxes as appropriate to the proposed laboratory testing.

Monitoring Well

A groundwater and/or ground gas monitoring well consists of a perforated pipe, which is installed in the ground. The standpipe is typically 50mm nominal in diameter and is installed in a lined borehole. It is perforated from the base with a sand/gravel surround through the soil horizon of interest to an appropriate depth below ground level. Above this there is a bentonite seal with solid pipework and is provided with an end cap or a gas valve at the top as appropriate.

Gas monitoring is carried out via the gas tap. Water sampling/purging can be undertaken by removing the gas tap and bung.

The well is usually completed at the surface with a flush cast iron cover or raised lockable cover.

Groundwater Monitoring – Dip Meter

The dip meter is used to measure standing water levels within boreholes. The probe is lowered into the borehole until the meter detects the groundwater with an audible 'beep'. The level is then read from the tape.

APPENDIX C

Contamination Laboratory Test Methods and Results



These screening values are valid at the time of writing but may be subject to change and any such changes will have implications for the assessments based on them. Their validity should be confirmed at the time of site development.

Table 1 – Tier 1 Screening Values

Contaminant	Units	Proposed Land Use					
		Residential with home grown produce consumption	Residential without home grown produce consumption	Open Space * (Residential)	Open Space * (Park)	Allotments	Commercial / Industrial
Arsenic (As) [2]	mg/kg	37	40	79	170	43	640
Cadmium (Cd) [2]	mg/kg	11	85	120	555	1.9	190
Trivalent Chromium (CrIII) [2]	mg/kg	910	910	1,500	33,000	18,000	8600
Hexavalent Chromium (CrVI) [2]	mg/kg	6	6	7.7	220	1.8	33
Lead (Pb) [3]	mg/kg	200	310	630	1300	80	2330
Mercury (Hg) [1,2,7]	mg/kg	7.6-11	9.2-15	40	68-71	6.0	29-320
Selenium (Se) [2]	mg/kg	250	430	1,100	1,800	88	12,000
Nickel (Ni) [2,4]	mg/kg	130	180	230	800	53	980
Copper (Cu) [2,4]	mg/kg	2,400	7,100	12,000	44,000	520	68,000
Zinc (Zn) [2,4]	mg/kg	3,700	40,000	81,000	170,000	620	730,000
Phenol [1,2]	mg/kg	120-380	440-1200	440-1300	440-1300	23-83	440-1300
Benzo[a]pyrene [1,5]	mg/kg	1.7-2.4	2.6	4.9	10	0.67-2.7	36
Naphthalene [1,2]	mg/kg	2.3-13	2.3-13	77-430*	77-430*	4.1-24	77-430*
Total Cyanide (CN) [6]	mg/kg	/	/	/	/	/	/
Free Cyanide [6]	mg/kg	/	/	/	/	/	/
Complex Cyanides [6]	mg/kg	/	/	/	/	/	/
Thiocyanate [6]	mg/kg	/	/	/	/	/	/

Notes:

* Open Space levels calculated on the basis of the exposure modelling developed in the C4SL research.

+ Screening values constrained to saturation limit. Higher values may be acceptable on a site specific basis.

[1] Where ranges of values are given for organic contaminants the screening value is dependent on the Soil +Organic Matter.

[2] LQM/CIEH S4UL (2014). Copyright Land Quality Management Ltd. reproduced with permission; Publication Number S4UL 3116. All rights reserved.

[3] C4SL (DEFRA 2014).

[4] Copper, Zinc and Nickel may have phototoxic effects at the given concentrations. Alternative criteria should be adopted for importation of Topsoil or other soils for cultivation. BS3882:2015 and BS8601:2013 suggest values of 200 to 300mg/kg for Zn, 100 to 200mg/kg for Cu, and 60 to 110mg/kg for Ni, for topsoil and subsoil, depending on pH.

[5] Based on the Surrogate Marker approach and modelled using the modified exposure parameters of C4SL but retaining 'minimal risk' HCV.

[6] Screening criteria derived on a site specific basis if test results indicate.

[7] S4UL for Methyl Mercury, higher concentrations may be tolerable if inorganic mercury is the only species present. Lower concentrations apply for elemental Mercury.

THICKNESS OF COVER SYSTEMS FOR CONTAMINATED LAND

(Design to "Cover systems for land regeneration" by BRE, 2004)

Site : Kerswell Close, Tottenham, N15 5HT

Location : Made Ground across the site

Client : Selsdon Building Contractors Limited

Job No J15567

Made By SKT

Checked By SKT

Date 08-Nov-23

Page 1 of 1

Model adopted for calculations :



Calculations :

Contaminant : Benzo(a)pyrene (PAH)

Proposed Land-Use Category : Public Open Space (Residential)

Screening Value of the Contaminant, T_v : 4.9 mg/kg

Measured Concentration in Existing Soil, T_g : 9.1 mg/kg

Contaminant Concentration of Existing Ground
(expressed as a multiple of T_v), $C_g = T_g/T_v$: 1.857

Unknown Clean Cover.

Since Concentration of Cover (T_c) is Unknown,

Assume $C_c = T_c/T_v$: 0.5

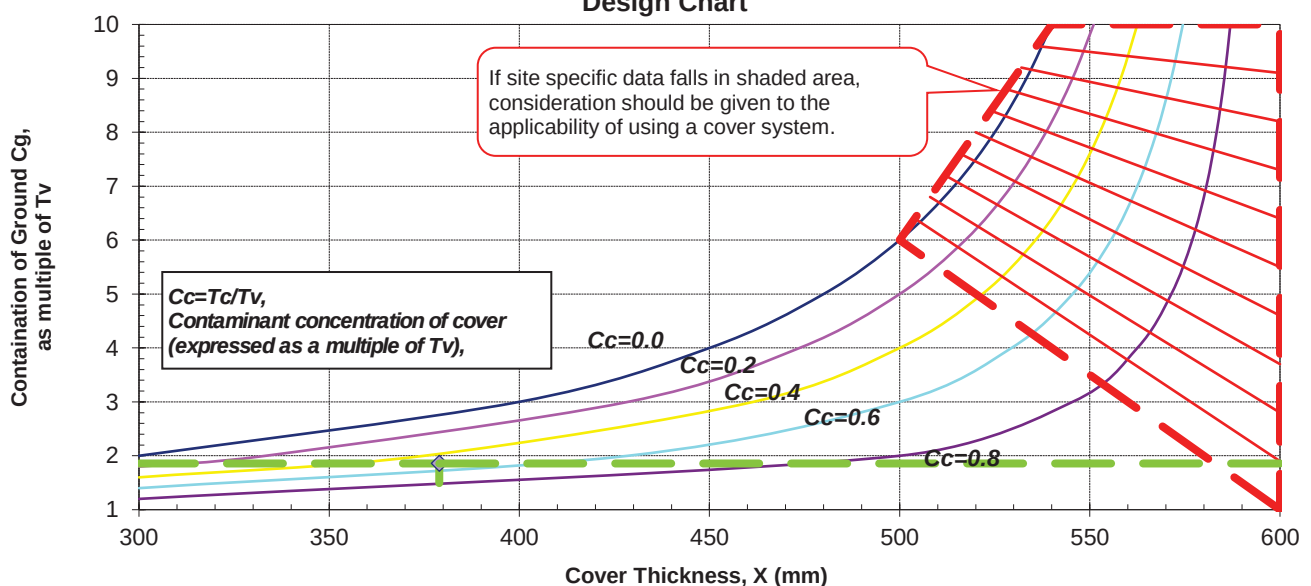
Thickness of Mixed Zone Assumed, M : 600 mm

Thickness of Cover Calculated, $X = (C_g - 1)/(C_g - C_c) * M$: 379 mm

Thickness of Clean Cover Required : 380 mm

The required thickness of cover MUST be redesigned once the details of the cover are known.

Design Chart



Note:

1. This calculation MUST be revised, based on the details of the soil to be imported.
2. The clean cover has not been imported to site yet, therefore a value of $C_c = 0.5$ is assumed in above calculations.
3. The contaminant concentrations in the imported soil must not exceed the target guideline value adopted above.
4. To revise the calculation the design chart shown above could be used.

THICKNESS OF COVER SYSTEMS FOR CONTAMINATED LAND

(Design to "Cover systems for land regeneration" by BRE, 2004)

Site : Kerswell Close, Tottenham, N15 5HT

Location : Made Ground across the site

Client : Selsdon Building Contractors Limited

Job No J15567

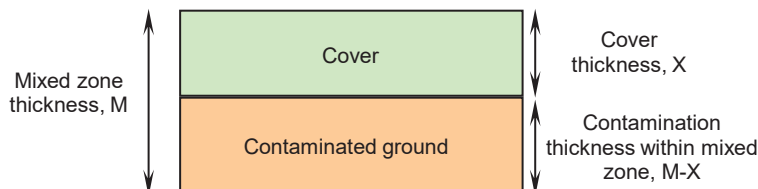
Made By SKT

Checked By SKT

Date 08-Nov-23

Page 1 of 1

Model adopted for calculations :



Calculations :

Contaminant : Lead (Pb)

Proposed Land-Use Category : Public Open Space (Residential)

Screening Value of the Contaminant, Tv : 630 mg/kg

Measured Concentration in Existing Soil, Tg : 820 mg/kg

Contaminant Concentration of Existing Ground
(expressed as a multiple of Tv), $C_g = T_g / T_v$: 1.302

Unknown Clean Cover. 10

Since Concentration of Cover (Tc) is Unknown,
Assume $C_c = T_c / T_v$: 0.5

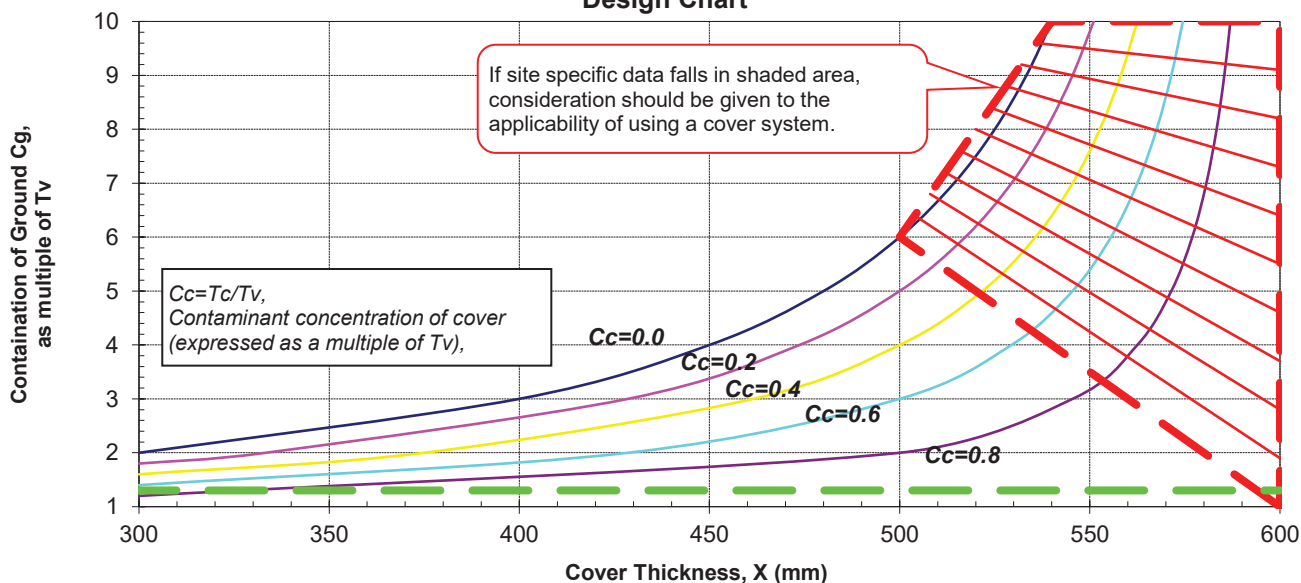
Thickness of Mixed Zone Assumed, M : 600 mm

Thickness of Cover Calculated, $X = (C_g - 1) / (C_g - C_c) * M$: 226 mm

Minimum Thickness of Clean Cover Recommended : 300 mm

The required thickness of cover MUST be redesigned once the details of the cover are known.

Design Chart



Note:

1. This calculation MUST be revised, based on the details of the soil to be imported.
2. The clean cover has not been imported to site yet, therefore a value of $C_c = 0.5$ is assumed in above calculations.
3. The contaminant concentrations in the imported soil must not exceed the target guideline value adopted above.
4. To revise the calculation the design chart shown above could be used.

**Sarah Toms**

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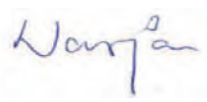
t: 01923 225404
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e: reception@i2analytical.com

Analytical Report Number : 23-60646

Replaces Analytical Report Number: 23-60646, issue no. 1
Additional analysis undertaken.

Quantification added on the samples 2835103, 2835104 and 2835106 as per client's request

Project / Site name:	Kerswell Close, London N15	Samples received on:	05/10/2023
Your job number:	J15567	Samples instructed on/ Analysis started on:	05/10/2023
Your order number:	J15567-1	Analysis completed by:	30/10/2023
Report Issue Number:	2	Report issued on:	30/10/2023
Samples Analysed:	8 soil samples		


Signed:

Dominika Warjan
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

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: 23-60646
 Project / Site name: Kerswell Close, London N15
 Your Order No: J15567-1

Lab Sample Number				2835103	2835104	2835105	2835106	2835107
Sample Reference				HA01	HA02	WLS01	WLS02	WLS02
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.00-0.60	0.30	0.50	0.60	1.50
Date Sampled				03/10/2023	03/10/2023	03/10/2023	03/10/2023	03/10/2023
Time Taken				1000	1200	1030	1300	1300
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	8.7	8.9	14	13	18
Total mass of sample received	kg	0.001	NONE	1.8	0.8	0.4	0.9	0.4

Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	Chrysotile	Chrysotile	-	Chrysotile	-
Asbestos in Soil	Type	N/A	ISO 17025	Detected	Detected	Not-detected	Detected	Not-detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	< 0.001	< 0.001	-	0.141	-
Asbestos Quantification Total	%	0.001	ISO 17025	< 0.001	< 0.001	-	0.141	-
Asbestos Analyst ID	N/A	N/A	N/A	WEM	WEM	MLO	WEM	MLO

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8	9.6	8.1	8.5	8
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.0461	0.246	0.0431	0.113	0.175
Sulphide	mg/kg	1	MCERTS	2.9	2	< 1.0	9.8	< 1.0
Organic Matter (automated)	%	0.1	MCERTS	5.4	3.9	3.2	4.2	1

Total Phenols

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

Naphthalene	mg/kg	0.05	MCERTS	0.29	0.46	0.05	0.12	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	0.13	0.22	< 0.05	0.08	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	0.65	0.7	< 0.05	0.09	< 0.05
Fluorene	mg/kg	0.05	MCERTS	0.51	0.54	< 0.05	0.1	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	5.1	6.6	0.31	1.6	< 0.05
Anthracene	mg/kg	0.05	MCERTS	1.1	1.4	0.08	0.33	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	7.3	9.5	0.79	3.9	< 0.05
Pyrene	mg/kg	0.05	MCERTS	6.1	8.2	0.71	3.3	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	3.3	4.4	0.44	2	< 0.05
Chrysene	mg/kg	0.05	MCERTS	3.1	4.3	0.42	1.8	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	3.9	5.5	0.54	2.4	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	1.6	1.5	0.27	1	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	3.5	4.4	0.46	2	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	1.8	2.1	0.26	1.1	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	0.46	0.57	0.08	0.31	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	2	2.5	0.3	1.3	< 0.05

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	40.7	52.7	4.71	21.4	< 0.80
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Analytical Report Number: 23-60646
 Project / Site name: Kerswell Close, London N15
 Your Order No: J15567-1

Lab Sample Number				2835103	2835104	2835105	2835106	2835107
Sample Reference				HA01	HA02	WLS01	WLS02	WLS02
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.00-0.60	0.30	0.50	0.60	1.50
Date Sampled				03/10/2023	03/10/2023	03/10/2023	03/10/2023	03/10/2023
Time Taken				1000	1200	1030	1300	1300
Analytical Parameter (Soil Analysis)				Units	Limit of detection	Accreditation Status		

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	21	27	14	18	9.9
Boron (water soluble)	mg/kg	0.2	MCERTS	-	2	-	-	-
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	1.8	1.4	< 0.2	2	< 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	47	40	29	35	37
Copper (aqua regia extractable)	mg/kg	1	MCERTS	86	160	51	140	21
Lead (aqua regia extractable)	mg/kg	1	MCERTS	400	820	170	480	25
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	1.3	1.1	0.7	0.8	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	30	32	18	27	17
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	-	61	-	-	-
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	330	680	120	420	140

Petroleum Hydrocarbons

TPH C10 - C40 _{EH, CU, ID, TOTAL}	mg/kg	10	MCERTS	-	130	-	-	-
TPH2 (C6 - C10) _{HS, ID, TOTAL}	mg/kg	1	NONE	-	< 0.1	-	-	-
TPH C6 - C40 _{EH, CU+HS, CU, ID, TOTAL}	mg/kg	10	NONE	-	130	-	-	-

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



Analytical Report Number: 23-60646
 Project / Site name: Kerswell Close, London N15
 Your Order No: J15567-1

Lab Sample Number				2835108	2835109	2835110
Sample Reference				WLS03	WLS03	WLS04
Sample Number				None Supplied	None Supplied	None Supplied
Depth (m)				0.50	0.80	0.50
Date Sampled				03/10/2023	03/10/2023	03/10/2023
Time Taken				1430	1430	1500
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status			
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	9.4	19	12
Total mass of sample received	kg	0.001	NONE	0.6	0.3	0.9

Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	-	-
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	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	MLO	MLO	MLO

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	7.9	7.6	8.1
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.0729	0.225	0.135
Sulphide	mg/kg	1	MCERTS	2.1	< 1.0	3.3
Organic Matter (automated)	%	0.1	MCERTS	2.7	0.9	2.6

Total Phenols

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

Naphthalene	mg/kg	0.05	MCERTS	0.18	< 0.05	0.2
Acenaphthylene	mg/kg	0.05	MCERTS	0.1	< 0.05	0.39
Acenaphthene	mg/kg	0.05	MCERTS	0.26	< 0.05	0.32
Fluorene	mg/kg	0.05	MCERTS	0.23	< 0.05	0.27
Phenanthrene	mg/kg	0.05	MCERTS	2.7	0.14	4.1
Anthracene	mg/kg	0.05	MCERTS	0.62	< 0.05	1.2
Fluoranthene	mg/kg	0.05	MCERTS	5.3	0.35	14
Pyrene	mg/kg	0.05	MCERTS	4.6	0.3	13
Benzo(a)anthracene	mg/kg	0.05	MCERTS	2.5	0.19	7.9
Chrysene	mg/kg	0.05	MCERTS	2.4	0.21	7.1
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	3.3	0.27	12
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	1.2	0.13	3.8
Benzo(a)pyrene	mg/kg	0.05	MCERTS	2.8	0.25	9.1
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	1.5	0.15	5.5
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	0.42	< 0.05	1.3
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	1.7	0.16	6.4

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	29.8	2.15	86.5
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Analytical Report Number: 23-60646
 Project / Site name: Kerswell Close, London N15
 Your Order No: J15567-1

Lab Sample Number				2835108	2835109	2835110
Sample Reference				WLS03	WLS03	WLS04
Sample Number				None Supplied	None Supplied	None Supplied
Depth (m)				0.50	0.80	0.50
Date Sampled				03/10/2023	03/10/2023	03/10/2023
Time Taken				1430	1430	1500
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status			
Heavy Metals / Metalloids						
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	22	18	34
Boron (water soluble)	mg/kg	0.2	MCERTS	1.3	-	-
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	2.1
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	40	46	29
Copper (aqua regia extractable)	mg/kg	1	MCERTS	88	22	110
Lead (aqua regia extractable)	mg/kg	1	MCERTS	410	29	700
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	0.8	< 0.3	1.2
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	30	24	35
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	59	-	-
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	300	67	360
Petroleum Hydrocarbons						
TPH C10 - C40 _{EH, CU, ID, TOTAL}	mg/kg	10	MCERTS	30	-	-
TPH2 (C6 - C10) _{HS, ID, TOTAL}	mg/kg	1	NONE	< 0.1	-	-
TPH C6 - C40 _{EH, CU+HS, CU, ID, TOTAL}	mg/kg	10	NONE	30	-	-

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



Analytical Report Number: 23-60646
Project / Site name: Kerswell Close, London N15
Your Order No: J15567-1

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
2835103	HA01	0.00-0.60	210	Loose Fibres & Loose Fibrous Debris	Chrysotile	< 0.001	< 0.001
2835104	HA02	0.30	100	Loose Fibres	Chrysotile	< 0.001	< 0.001
2835106	WLS02	0.60	120	Asbestos Cement	Chrysotile	0.141	0.141

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



Analytical Report Number : 23-60646

Project / Site name: Kerswell Close, London N15

* 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 *
2835103	HA01	None Supplied	0.00-0.60	Brown sand with gravel.
2835104	HA02	None Supplied	0.3	Brown sand with gravel.
2835105	WLS01	None Supplied	0.5	Brown loam and clay with gravel.
2835106	WLS02	None Supplied	0.6	Brown sand with gravel.
2835107	WLS02	None Supplied	1.5	Brown clay.
2835108	WLS03	None Supplied	0.5	Brown loam with gravel.
2835109	WLS03	None Supplied	0.8	Brown clay with gravel.
2835110	WLS04	None Supplied	0.5	Brown clay and sand with gravel.

Analytical Report Number : 23-60646

Project / Site name: Kerswell Close, London N15

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
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode.	In-house method	L010-PL	D	MCERTS
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
TPH2 (Soil)	Determination of hydrocarbons C6-C10 by headspace GC-MS.	In-house method based on USEPA8260	L088-PL	W	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
TPH Banding in Soil by FID	Determination of hexane extractable hydrocarbons in soil by GC-FID.	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-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
Organic matter (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
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



Analytical Report Number : 23-60646
Project / Site name: Kerswell Close, London N15

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
TPH C6 - C40 (soil)	Determination of TPH bands by HS-GC-MS/GC-FID	TPH> C10 Dry soil n-house method with silica gel split/clean up. TPH <C10 by Wet by HS-GC-MS	L088/L076	W/D	NONE

For method numbers ending in 'UK or A' analysis have been carried out in our laboratory in the United Kingdom (WATFORD).
For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).
For method numbers ending in 'PL or B' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.
Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

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

**Sarah Toms**

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Stuart Way
East Grinstead
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RH19 4QA

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

t: 01923 225404
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e: reception@i2analytical.com

Analytical Report Number : 23-60648

Project / Site name:	Kerswell Close, London N15	Samples received on:	05/10/2023
Your job number:	J15567	Samples instructed on/ Analysis started on:	05/10/2023
Your order number:	J15567-1	Analysis completed by:	16/10/2023
Report Issue Number:	1	Report issued on:	16/10/2023
Samples Analysed:	2 wac multi samples		


Signed:

Dominika Liana
Junior Reporting Specialist
For & on behalf of i2 Analytical Ltd.

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

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

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

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

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.

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Waste Acceptance Criteria Analytical Results							
Report No:	23-60648						
					Client: SOUTHERNT		
Location	Kerswell Close, London N15						
Lab Reference (Sample Number)	2835118				Landfill Waste Acceptance Criteria		
					Limits		
Sampling Date	03/10/2023				Inert Waste Landfill	Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill	Hazardous Waste Landfill
Sample ID	HA02						
Depth (m)	0.30						
Solid Waste Analysis							
TOC (%)**	1.9				3%	5%	6%
Loss on Ignition (%) **	5.6				--	--	10%
BTEX (µg/kg)**	< 10				6000	--	--
Sum of PCBs (mg/kg)**	< 0.30				1	--	--
Mineral Oil (mg/kg) BH 10 CU AL	23				500	--	--
Total PAH (WAC-17) (mg/kg)	53.8				100	--	--
pH (units)**	7.6				--	>6	--
Acid Neutralisation Capacity (mmol / kg)	1.4				--	To be evaluated	To be evaluated
Eluate Analysis					Limit values for compliance leaching test		
(BS EN 12457 - 3 preparation utilising end over end leaching procedure)	2:1	8:1		Cumulative 10:1	using BS EN 12457-3 at L/S 10 l/kg (mg/kg)		
	mg/l	mg/l		mg/kg			
Arsenic *	0.011	0.012		0.12	0.5	2	25
Barium *	0.036	0.013		0.16	20	100	300
Cadmium *	< 0.0005	< 0.0005		< 0.0020	0.04	1	5
Chromium *	0.013	0.0053		0.061	0.5	10	70
Copper *	0.043	0.026		0.28	2	50	100
Mercury *	< 0.0015	< 0.0015		< 0.010	0.01	0.2	2
Molybdenum *	0.031	0.0067		0.094	0.5	10	30
Nickel *	0.0025	0.0012		0.014	0.4	10	40
Lead *	0.0093	0.0094		0.094	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 *	0.022	0.0106		0.12	4	50	200
Chloride *	8.4	< 4.0		25	800	15000	25000
Fluoride*	1.0	0.83		8.5	10	150	500
Sulphate *	40	7.5		110	1000	20000	50000
TDS*	160	69		790	4000	60000	100000
Phenol Index (Monohydric Phenols) *	< 0.13	< 0.13		< 0.50	1	-	-
DOC	20	22		220	500	800	1000
Leach Test Information							
Stone Content (%)	< 0.1						
Sample Mass (kg)	0.80						
Dry Matter (%)	91						
Moisture (%)	8.9						
Stage 1							
Volume Eluate L2 (litres)	0.33						
Filtered Eluate VE1 (litres)	0.20						
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:	23-60648							
					Client: SOUTHERNT			
Location	Kerswell Close, London N15							
Lab Reference (Sample Number)	2835119				Landfill Waste Acceptance Criteria			
Sampling Date	03/10/2023				Limits			
Sample ID	WLS03				Inert Waste Landfill	Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill	Hazardous Waste Landfill	
Depth (m)	0.50							
Solid Waste Analysis								
TOC (%)**	1.3				3%	5%	6%	
Loss on Ignition (%) **	4.1				--	--	10%	
BTEX (µg/kg)**	< 10				6000	--	--	
Sum of PCBs (mg/kg)**	< 0.30				1	--	--	
Mineral Oil (mg/kg) BH 10 CU AL	< 10				500	--	--	
Total PAH (WAC-17) (mg/kg)	30.5				100	--	--	
pH (units)**	7.0				--	>6	--	
Acid Neutralisation Capacity (mmol / kg)	0.00				--	To be evaluated	To be evaluated	
Eluate Analysis					Limit values for compliance leaching test			
(BS EN 12457 - 3 preparation utilising end over end leaching procedure)	2:1	8:1		Cumulative 10:1	using BS EN 12457-3 at L/S 10 l/kg (mg/kg)			
	mg/l	mg/l		mg/kg				
Arsenic *	< 0.010	< 0.010		0.059	0.5	2	25	
Barium *	0.032	0.016		0.17	20	100	300	
Cadmium *	< 0.0005	< 0.0005		< 0.0020	0.04	1	5	
Chromium *	0.0048	0.0020		0.023	0.5	10	70	
Copper *	0.044	0.022		0.24	2	50	100	
Mercury *	< 0.0015	< 0.0015		< 0.010	0.01	0.2	2	
Molybdenum *	0.019	0.0042		0.057	0.5	10	30	
Nickel *	0.0031	0.0011		0.013	0.4	10	40	
Lead *	< 0.0050	< 0.0050		0.036	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 *	0.021	0.0054		0.070	4	50	200	
Chloride *	< 4.0	< 4.0		< 15	800	15000	25000	
Fluoride*	0.85	0.64		6.6	10	150	500	
Sulphate *	14	3.8		48	1000	20000	50000	
TDS*	120	63		690	4000	60000	100000	
Phenol Index (Monohydric Phenols) *	< 0.13	< 0.13		< 0.50	1	-	-	
DOC	23	16		170	500	800	1000	
Leach Test Information								
Stone Content (%)	< 0.1							
Sample Mass (kg)	0.70							
Dry Matter (%)	91							
Moisture (%)	9.4							
Stage 1								
Volume Eluate L2 (litres)	0.34							
Filtered Eluate VE1 (litres)	0.18							
Results are expressed on a dry weight basis, after correction for moisture content where applicable. * = UKAS accredited (liquid eluate analysis only)								
Stated limits are for guidance only and I2 cannot be held responsible for any discrepancies with current legislation ** = MCERTS accredited								
Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes as defined by the Waste (England and Wales) Regulations 2011 (as amended) and EA Guidance WM3. This analysis is only applicable for landfill acceptance criteria (The Environmental Permitting (England and Wales) Regulations) and does not give any indication as to whether a waste may be hazardous or non-hazardous.								



Analytical Report Number : 23-60648

Project / Site name: Kerswell Close, London N15

* 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 *
2835118	HA02	None Supplied	0.3	Brown sand with gravel.
2835119	WLS03	None Supplied	0.5	Brown loam with gravel.

Analytical Report Number : 23-60648
Project / Site name: Kerswell Close, London N15

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 on 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
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



Analytical Report Number : 23-60648
Project / Site name: Kerswell Close, London N15

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

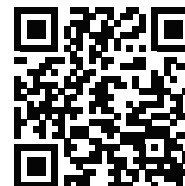
Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Metals in WAC leachate (BS EN 12457-3 Prep)	Determination of metals in leachate by acidification followed by ICP-OES.	In-house method based on Standard Methods for the 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.

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)



688R8-KMMTC-Y1CGD

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

Job name

J15567

Description/Comments

Preliminary waste classification of the Made Ground.

Project

J15567 Tottenham

Site

Kerswell Close, Tottenham

Classified by

Name: **Sarah Toms**
 Date: **02 Nov 2023 15:50 GMT**
 Telephone: **01342 333129**
 Company: **Southern Testing Ltd**
Keeble House
Stuart Way
East Grinstead
RH19 4QA

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
 05 Aug 2021

Next 3 year Refresher due by Aug 2024

Purpose of classification

2 - Material Characterisation

Address of the waste

Kerswell Close, Tottenham

Post Code N15 5NT

SIC for the process giving rise to the waste

41202 Construction of domestic buildings

Description of industry/producer giving rise to the waste

Construction

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

Redevelopment of a brownfield site for residential use.

Description of the waste

Made Ground: brown silty sand and gravel of flint, brick, concrete, mortar, rare glass and clinker.

Job summary

#	Sample name	Depth [m]	Classification Result	Hazard properties	WAC Results			Page
					Inert	SNRHW	Hazardous	
1	HA02	0.3	Non Hazardous		Pass	Pass	N/A	3
2	WLS03	0.5	Non Hazardous		Pass	Pass	N/A	7

Related documents

#	Name	Description
1	STL Contaminated Soils waste - WM3 v1.2.GB Oct 2021	waste stream template used to create this Job

WAC results

WAC Settings: samples in this Job constitute a single population.

WAC limits used to evaluate the samples in this Job: "UK"

The WAC used in this report are the WAC defined for the inert, stable non-reactive hazardous and hazardous classes of landfill in the UK. You should check the actual acceptance criteria when the disposal site is identified as they may differ from the generic WAC used in this report.

Report

Created by: Sarah Toms

Created date: 02 Nov 2023 15:50 GMT

Appendices	Page
Appendix A: Classifier defined and non GB MCL determinands	11
Appendix B: Rationale for selection of metal species	12
Appendix C: Version	13

Classification of sample: HA02

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

Sample details

Sample name:	LoW Code:
HA02	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.3 m	
Moisture content:	
8.9%	
(dry weight correction)	

Hazard properties

None identified

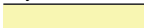
Determinands

Moisture content: 8.9% Dry 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	asbestos 650-013-00-6	-----	12001-28-4 132207-32-0 12172-73-5 77536-66-4 77536-68-6 77536-67-5 12001-29-5		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
2	pH				9.6 pH		9.6 pH	9.6 pH		
3	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
4	phenol 604-001-00-2	203-632-7	108-95-2		<1 mg/kg		<1 mg/kg	<0.0001 %		<LOD
5	arsenic { arsenic trioxide } 033-003-00-0	215-481-4	1327-53-3		27 mg/kg	1.32	32.735 mg/kg	0.00327 %	✓	
6	boron { diboron trioxide; boric oxide } 005-008-00-8	215-125-8	1303-86-2		2 mg/kg	3.22	5.913 mg/kg	0.000591 %	✓	
7	cadmium { cadmium oxide } 048-002-00-0	215-146-2	1306-19-0		1.4 mg/kg	1.142	1.469 mg/kg	0.000147 %	✓	
8	chromium in chromium(VI) compounds { chromium(VI) oxide } 024-001-00-0	215-607-8	1333-82-0		<1.8 mg/kg	1.923	<3.462 mg/kg	<0.000346 %		<LOD
9	chromium in chromium(III) compounds { chromium(III) oxide (worst case) } 215-160-9		1308-38-9		40 mg/kg	1.462	53.684 mg/kg	0.00537 %	✓	
10	copper { dicopper oxide; copper (I) oxide } 029-002-00-X	215-270-7	1317-39-1		160 mg/kg	1.126	165.42 mg/kg	0.0165 %	✓	
11	lead { lead chromate } 082-004-00-2	231-846-0	7758-97-6	1	820 mg/kg	1.56	1174.516 mg/kg	0.0753 %	✓	
12	mercury { mercury dichloride } 080-010-00-X	231-299-8	7487-94-7		1.1 mg/kg	1.353	1.367 mg/kg	0.000137 %	✓	

#		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								
13		nickel { nickel chromate }				32 mg/kg	2.976	87.457 mg/kg	0.00875 %		✓	
		028-035-00-7	238-766-5	14721-18-7								
14		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<1 mg/kg	1.405	<1.405 mg/kg	<0.000141 %			<LOD
		034-002-00-8										
15		vanadium {  divanadium pentaoxide; vanadium pentoxide }				61 mg/kg	1.785	99.997 mg/kg	0.01 %		✓	
		023-001-00-8	215-239-8	1314-62-1								
16		zinc { zinc oxide }				680 mg/kg	1.245	777.232 mg/kg	0.0777 %		✓	
		030-013-00-7	215-222-5	1314-13-2								
17		naphthalene				0.46 mg/kg		0.422 mg/kg	0.0000422 %		✓	
		601-052-00-2	202-049-5	91-20-3								
18		acenaphthylene				0.22 mg/kg		0.202 mg/kg	0.0000202 %		✓	
			205-917-1	208-96-8								
19		acenaphthene				0.7 mg/kg		0.643 mg/kg	0.0000643 %		✓	
			201-469-6	83-32-9								
20		fluorene				0.54 mg/kg		0.496 mg/kg	0.0000496 %		✓	
			201-695-5	86-73-7								
21		phenanthrene				6.6 mg/kg		6.061 mg/kg	0.000606 %		✓	
			201-581-5	85-01-8								
22		anthracene				1.4 mg/kg		1.286 mg/kg	0.000129 %		✓	
			204-371-1	120-12-7								
23		fluoranthene				9.5 mg/kg		8.724 mg/kg	0.000872 %		✓	
			205-912-4	206-44-0								
24		pyrene				8.2 mg/kg		7.53 mg/kg	0.000753 %		✓	
			204-927-3	129-00-0								
25		benzo[a]anthracene				4.4 mg/kg		4.04 mg/kg	0.000404 %		✓	
		601-033-00-9	200-280-6	56-55-3								
26		chrysene				4.3 mg/kg		3.949 mg/kg	0.000395 %		✓	
		601-048-00-0	205-923-4	218-01-9								
27		benzo[b]fluoranthene				5.5 mg/kg		5.051 mg/kg	0.000505 %		✓	
		601-034-00-4	205-911-9	205-99-2								
28		benzo[k]fluoranthene				1.5 mg/kg		1.377 mg/kg	0.000138 %		✓	
		601-036-00-5	205-916-6	207-08-9								
29		benzo[a]pyrene; benzo[def]chrysene				4.4 mg/kg		4.04 mg/kg	0.000404 %		✓	
		601-032-00-3	200-028-5	50-32-8								
30		indeno[123-cd]pyrene				2.1 mg/kg		1.928 mg/kg	0.000193 %		✓	
			205-893-2	193-39-5								
31		dibenz[a,h]anthracene				0.57 mg/kg		0.523 mg/kg	0.0000523 %		✓	
		601-041-00-2	200-181-8	53-70-3								
32		benzo[ghi]perylene				2.5 mg/kg		2.296 mg/kg	0.00023 %		✓	
			205-883-8	191-24-2								
33		TPH (C6 to C40) petroleum group				130 mg/kg		119.376 mg/kg	0.0119 %		✓	
				TPH								
34		confirm TPH has NOT arisen from diesel or petrol				☒						
Total:									0.215 %			

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 No visual or olfactory evidence of free product in the sample.

Hazard Statements hit:

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

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.0119%)

WAC results for sample: HA02

WAC Settings: samples in this Job constitute a single population.

WAC limits used to evaluate this sample: "UK"

The WAC used in this report are the WAC defined for the inert, stable non-reactive hazardous and hazardous classes of landfill in the UK. You should check the actual acceptance criteria when the disposal site is identified as they may differ from the generic WAC used in this report.

The sample **PASSES** the Inert (Inert waste landfill) criteria.

The sample **PASSES** the SNRHW (Stable non-reactive hazardous waste in non-hazardous landfill) criteria.

WAC Determinands

Solid Waste Analysis				Landfill Waste Acceptance Criteria Limits		
#	Determinand		User entered data	Inert waste landfill	Stable non-reactive hazardous waste in non-hazardous landfill	Hazardous waste landfill
1	TOC (total organic carbon)	%	1.9	3	5	6
2	LOI (loss on ignition)	%	5.6	-	-	10
3	BTEX (benzene, toluene, ethylbenzene and xylenes)	mg/kg	<0.01	6	-	-
4	PCBs (polychlorinated biphenyls, 7 congeners)	mg/kg	<0.3	1	-	-
5	Mineral oil (C10 to C40)	mg/kg	23	500	-	-
6	PAHs (polycyclic aromatic hydrocarbons)	mg/kg	53.8	100	-	-
7	pH	pH	7.6	-	>6	-
8	ANC (acid neutralisation capacity)	mol/kg	1.4	-	-	-
Eluate Analysis 10:1						
9	arsenic	mg/kg	0.12	0.5	2	25
10	barium	mg/kg	0.16	20	100	300
11	cadmium	mg/kg	<0.002	0.04	1	5
12	chromium	mg/kg	0.061	0.5	10	70
13	copper	mg/kg	0.28	2	50	100
14	mercury	mg/kg	<0.01	0.01	0.2	2
15	molybdenum	mg/kg	0.094	0.5	10	30
16	nickel	mg/kg	0.014	0.4	10	40
17	lead	mg/kg	0.094	0.5	10	50
18	antimony	mg/kg	<0.02	0.06	0.7	5
19	selenium	mg/kg	<0.04	0.1	0.5	7
20	zinc	mg/kg	0.12	4	50	200
21	chloride	mg/kg	25	800	15,000	25,000
22	fluoride	mg/kg	8.5	10	150	500
23	sulphate	mg/kg	110	1,000	20,000	50,000
24	phenol index	mg/kg	<0.5	1	-	-
25	DOC (dissolved organic carbon)	mg/kg	220	500	800	1,000
26	TDS (total dissolved solids)	mg/kg	790	4,000	60,000	100,000

Key

	User supplied data
	Not applicable

Classification of sample: WLS03

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

Sample details

Sample name:	LoW Code:
WLS03	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.5 m	
Moisture content:	
9.4%	
(dry weight correction)	

Hazard properties

None identified

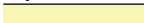
Determinands

Moisture content: 9.4% Dry 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	asbestos 650-013-00-6	-----	12001-28-4 132207-32-0 12172-73-5 77536-66-4 77536-68-6 77536-67-5 12001-29-5		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
2	pH		PH		7.9 pH		7.9 pH	7.9 pH		
3	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
4	phenol 604-001-00-2	203-632-7	108-95-2		<1 mg/kg		<1 mg/kg	<0.0001 %		<LOD
5	arsenic { arsenic trioxide } 033-003-00-0	215-481-4	1327-53-3		22 mg/kg	1.32	26.551 mg/kg	0.00266 %	✓	
6	boron { diboron trioxide; boric oxide } 005-008-00-8	215-125-8	1303-86-2		1.3 mg/kg	3.22	3.826 mg/kg	0.000383 %	✓	
7	cadmium { cadmium oxide } 048-002-00-0	215-146-2	1306-19-0		<0.2 mg/kg	1.142	<0.228 mg/kg	<0.0000228 %		<LOD
8	chromium in chromium(VI) compounds { chromium(VI) oxide } 024-001-00-0	215-607-8	1333-82-0		<1.8 mg/kg	1.923	<3.462 mg/kg	<0.000346 %		<LOD
9	chromium in chromium(III) compounds { chromium(III) oxide (worst case) } 215-160-9		1308-38-9		40 mg/kg	1.462	53.439 mg/kg	0.00534 %	✓	
10	copper { dicopper oxide; copper (I) oxide } 029-002-00-X	215-270-7	1317-39-1		88 mg/kg	1.126	90.565 mg/kg	0.00906 %	✓	
11	lead { lead chromate } 082-004-00-2	231-846-0	7758-97-6	1	410 mg/kg	1.56	584.574 mg/kg	0.0375 %	✓	
12	mercury { mercury dichloride } 080-010-00-X	231-299-8	7487-94-7		0.8 mg/kg	1.353	0.99 mg/kg	0.000099 %	✓	

#		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								
13		nickel { nickel chromate }				30 mg/kg	2.976	81.616 mg/kg	0.00816 %	✓		
		028-035-00-7	238-766-5	14721-18-7								
14		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<1 mg/kg	1.405	<1.405 mg/kg	<0.000141 %		<LOD	
		034-002-00-8										
15		vanadium {  divanadium pentaoxide; vanadium pentoxide }				59 mg/kg	1.785	96.276 mg/kg	0.00963 %	✓		
		023-001-00-8	215-239-8	1314-62-1								
16		zinc { zinc oxide }				300 mg/kg	1.245	341.329 mg/kg	0.0341 %	✓		
		030-013-00-7	215-222-5	1314-13-2								
17		naphthalene				0.18 mg/kg		0.165 mg/kg	0.0000165 %	✓		
		601-052-00-2	202-049-5	91-20-3								
18		acenaphthylene				0.1 mg/kg		0.0914 mg/kg	0.00000914 %	✓		
			205-917-1	208-96-8								
19		acenaphthene				0.26 mg/kg		0.238 mg/kg	0.0000238 %	✓		
			201-469-6	83-32-9								
20		fluorene				0.23 mg/kg		0.21 mg/kg	0.000021 %	✓		
			201-695-5	86-73-7								
21		phenanthrene				2.7 mg/kg		2.468 mg/kg	0.000247 %	✓		
			201-581-5	85-01-8								
22		anthracene				0.62 mg/kg		0.567 mg/kg	0.0000567 %	✓		
			204-371-1	120-12-7								
23		fluoranthene				5.3 mg/kg		4.845 mg/kg	0.000484 %	✓		
			205-912-4	206-44-0								
24		pyrene				4.6 mg/kg		4.205 mg/kg	0.00042 %	✓		
			204-927-3	129-00-0								
25		benzo[a]anthracene				2.5 mg/kg		2.285 mg/kg	0.000229 %	✓		
		601-033-00-9	200-280-6	56-55-3								
26		chrysene				2.4 mg/kg		2.194 mg/kg	0.000219 %	✓		
		601-048-00-0	205-923-4	218-01-9								
27		benzo[b]fluoranthene				3.3 mg/kg		3.016 mg/kg	0.000302 %	✓		
		601-034-00-4	205-911-9	205-99-2								
28		benzo[k]fluoranthene				1.2 mg/kg		1.097 mg/kg	0.00011 %	✓		
		601-036-00-5	205-916-6	207-08-9								
29		benzo[a]pyrene; benzo[def]chrysene				2.8 mg/kg		2.559 mg/kg	0.000256 %	✓		
		601-032-00-3	200-028-5	50-32-8								
30		indeno[123-cd]pyrene				1.5 mg/kg		1.371 mg/kg	0.000137 %	✓		
			205-893-2	193-39-5								
31		dibenz[a,h]anthracene				0.42 mg/kg		0.384 mg/kg	0.0000384 %	✓		
		601-041-00-2	200-181-8	53-70-3								
32		benzo[ghi]perylene				1.7 mg/kg		1.554 mg/kg	0.000155 %	✓		
			205-883-8	191-24-2								
33		TPH (C6 to C40) petroleum group				30 mg/kg		27.422 mg/kg	0.00274 %	✓		
				TPH								
34		confirm TPH has NOT arisen from diesel or petrol				☒						
Total:									0.113 %			

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 No visual or olfactory evidence of free product in the sample.

Hazard Statements hit:

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

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.00274%)

WAC results for sample: WLS03

WAC Settings: samples in this Job constitute a single population.

WAC limits used to evaluate this sample: "UK"

The WAC used in this report are the WAC defined for the inert, stable non-reactive hazardous and hazardous classes of landfill in the UK. You should check the actual acceptance criteria when the disposal site is identified as they may differ from the generic WAC used in this report.

The sample PASSES the Inert (Inert waste landfill) criteria.

The sample PASSES the SNRHW (Stable non-reactive hazardous waste in non-hazardous landfill) criteria.

WAC Determinands

Solid Waste Analysis				Landfill Waste Acceptance Criteria Limits		
#	Determinand		User entered data	Inert waste landfill	Stable non-reactive hazardous waste in non-hazardous landfill	Hazardous waste landfill
1	TOC (total organic carbon)	%	1.3	3	5	6
2	LOI (loss on ignition)	%	4.1	-	-	10
3	BTEX (benzene, toluene, ethylbenzene and xylenes)	mg/kg	<0.01	6	-	-
4	PCBs (polychlorinated biphenyls, 7 congeners)	mg/kg	<0.3	1	-	-
5	Mineral oil (C10 to C40)	mg/kg	<10	500	-	-
6	PAHs (polycyclic aromatic hydrocarbons)	mg/kg	30.5	100	-	-
7	pH	pH	7	-	>6	-
8	ANC (acid neutralisation capacity)	mol/kg		-	-	-
Eluate Analysis 10:1						
9	arsenic	mg/kg	0.059	0.5	2	25
10	barium	mg/kg	0.17	20	100	300
11	cadmium	mg/kg	<0.002	0.04	1	5
12	chromium	mg/kg	0.023	0.5	10	70
13	copper	mg/kg	0.24	2	50	100
14	mercury	mg/kg	<0.01	0.01	0.2	2
15	molybdenum	mg/kg	0.057	0.5	10	30
16	nickel	mg/kg	0.013	0.4	10	40
17	lead	mg/kg	0.036	0.5	10	50
18	antimony	mg/kg	<0.02	0.06	0.7	5
19	selenium	mg/kg	<0.04	0.1	0.5	7
20	zinc	mg/kg	0.07	4	50	200
21	chloride	mg/kg	<15	800	15,000	25,000
22	fluoride	mg/kg	6.6	10	150	500
23	sulphate	mg/kg	48	1,000	20,000	50,000
24	phenol index	mg/kg	<0.5	1	-	-
25	DOC (dissolved organic carbon)	mg/kg	170	500	800	1,000
26	TDS (total dissolved solids)	mg/kg	690	4,000	60,000	100,000

Key

	User supplied data
	Not applicable

Appendix A: Classifier defined and non GB MCL determinands

• pH (CAS Number: PH)

Description/Comments: Appendix C4
Data source: WM3 1st Edition 2015
Data source date: 25 May 2015
Hazard Statements: None.

• 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

• 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

• divanadium pentaoxide; vanadium pentoxide (EC Number: 215-239-8, CAS Number: 1314-62-1)

GB MCL index number: 023-001-00-8
Description/Comments: Hazard statements H301, H330, H350 added by HazWasteOnline due to ATP 18 (Regulation (EU) 2022/692) considers vanadium pentoxide to be Carc. 1B; H350. The GB MCL Agency has reached the same opinion [but is yet to formerly make this change to the MCL List]. Substance has therefore been self-classified.
Additional Hazard Statement(s): Carc. 1B; H350 , Acute Tox. 3; H301 , Acute Tox. 2; H330
Reason for additional Hazards Statement(s):
20 Sep 2022 - Carc. 1B; H350 hazard statement sourced from: ATP 18 (Regulation (EU) 2022/692) considers vanadium pentoxide to be Carc. 1B; H350. The GB MCL Agency has reached the same opinion [but is yet to formerly make this change to the MCL List]. Substance has therefore been self-classified.
28 Sep 2022 - Acute Tox. 3; H301 hazard statement sourced from: ATP 18 (Regulation (EU) 2022/692) considers vanadium pentoxide to be "Acute tox 3; H301". The GB MCL Agency has reached the same opinion [but is yet to formerly make this change to the MCL List]. Substance has therefore been self-classified.
28 Sep 2022 - Acute Tox. 2; H330 hazard statement sourced from: ATP 18 (Regulation (EU) 2022/692) considers vanadium pentoxide to be "Acute tox 2; H330". The GB MCL Agency has reached the same opinion [but is yet to formerly make this change to the MCL List]. Substance has therefore been self-classified.

• 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

• **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

• **confirm TPH has NOT arisen from diesel or petrol**

Description/Comments: Chapter 3, section 4b requires a positive confirmation for benzo[a]pyrene to be used as a marker in evaluating Carc. 1B; H350 (HP 7) and Muta. 1B; H340 (HP 11)

Data source: WM3 1st Edition 2015

Data source date: 25 May 2015

Hazard Statements: None.

Appendix B: Rationale for selection of metal species

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] (edit as required)

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 (edit as required)

boron {diboron trioxide; boric oxide}

site specific

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. (edit as required) 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 (edit as required)

chromium in chromium(VI) compounds {chromium(VI) oxide}

Worst case CLP species based on hazard statements/molecular weight. Industrial sources include: production stainless steel, electroplating, wood preservation, anti-corrosion agents or coatings, pigments (edit as required)

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 (edit as required)

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. (edit as required) Worse case copper sulphate is very soluble and likely to have been leached away if ever present and/or not enough soluble sulphate detected. (edit as required)

lead {lead chromate}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

mercury {mercury dichloride}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

nickel {nickel chromate}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

selenium {selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex}

Harmonised group entry used as most reasonable case. Pigment cadmium sulphoselenide not likely to be present in this soil. No evidence for the other CLP entries: sodium selenite, nickel II selenite and nickel selenide, to be present in this soil. (edit as required)

vanadium {divanadium pentaoxide; vanadium pentoxide}

default

zinc {zinc oxide}

Not enough chromium VI for the default zinc chromate.

Appendix C: Version

HazWasteOnline Classification Engine: WM3 1st Edition v1.2.GB - Oct 2021

HazWasteOnline Classification Engine Version: 2023.304.5791.10713 (31 Oct 2023)

HazWasteOnline Database: 2023.304.5791.10713 (31 Oct 2023)

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

APPENDIX D
Monitoring Data

D

Project Name		Project No		Operative		Date		Equipment Used					
Kerswell close, Tottenham		J15567		JB		26 October 2023		GFM436: S/N 10743 TIGER: S/N A-861240					
Well No	WLS01	Atm Press	mb temp	992	Time of Reading	Flow l/hr	Max:	0.0	Diff Pressure (Pa)	Max:	0		
				16C			Min:	0.0		Min:	0		
Well Depth (m)	3.00	Groundwater level from GL (m)	Dry	11:20	VOC ppm	Max:	0.1	LEL %	Max:	0.0			
						Min:	0.1		Min:	0.0			
	Time (Seconds)												
	30	60	90	120	180	240	300	360	420	480	540	600	
O ₂	19.7	18.0	18.1	17.5	17.0	16.8	16.8	16.8	16.8	16.7	16.7	16.7	
CO ₂	0.0	1.9	2.0	2.7	2.9	2.9	3.0	3.0	3.1	3.1	3.1	3.1	
CH ₄	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Remarks/Weather DRY/SUNNY GROUND WET							CO	Max:	0	H ₂ s		Max:	0
							ppm	Min:	0			ppm	Min:
Well No	WLS02	Atm Press	mb temp	990	Time of Reading	Flow l/hr	Max:	0.0	Diff Pressure (Pa)	Max:	0		
				16C			Min:	0.0		Min:	0		
Well Depth (m)	2.90	Groundwater level from GL (m)	Dry	11:35	VOC ppm	Max:	0.9	LEL %	Max:	0.0			
						Min:	0.7		Min:	0.0			
	Time (Seconds)												
	30	60	90	120	180	240	300	360	420	480	540	600	
O ₂	19.6	18.4	17.5	17.4	17.5	17.5	17.3	17.3	17.3	17.2	17.2	17.2	
CO ₂	2.1	2.4	2.4	2.4	2.4	2.5	2.6	2.6	2.7	2.7	2.7	2.7	
CH ₄	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Remarks/Weather DRY/SUNNY GROUND WET							CO	Max:	0	H ₂ s		Max:	0
							ppm	Min:	0			ppm	Min:
Well No	WLS03	Atm Press	mb temp	989	Time of Reading	Flow l/hr	Max:	0.0	Diff Pressure (Pa)	Max:	0		
				16C			Min:	0.0		Min:	0		
Well Depth (m)	2.90	Groundwater level from GL (m)	1.19	11:50	VOC ppm	Max:	0.1	LEL %	Max:	0.0			
						Min:	0.0		Min:	0.0			
	Time (Seconds)												
	30	60	90	120	180	240	300	360	420	480	540	600	
O ₂	20.9	20.3	20.2	20.1	20.1	20.1	20.1	20.1	20.1	20.1	20.1	20.1	
CO ₂	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	
CH ₄	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Remarks/Weather OVERCAST / GROUND WET							CO	Max:	0	H ₂ s		Max:	0

Project Name		Project No		Operative		Date		Equipment Used				
Kerswell Close, Tottenham		J15567		SKT		12 October 2023		GFM436: S/N 10743 TIGER: S/N A-861240				
Well No	WLS01	Atm Press mb temp °C	1011	Time of Reading	Flow l/hr	Max:	0.0	Diff Pressure (Pa)	Max:	0		
			17			Min:	0.0		Min:	0		
Well Depth (m)	3.10	Groundwater level from GL (m)	Dry	1205	VOC ppm	Max:	0.0	LEL %	Max:	/		
						Min:	0.0		Min:	/		
	Time (Seconds)											
	30	60	90	120	180	240	300	360	420	480	540	600
O ₂	18.5	18.3	18.2	18.1	18.0	17.8	17.7	/	/	/	/	18.0
CO ₂	2.6	2.7	2.8	3.0	3.2	3.4	3.5	/	/	/	/	3.0
CH ₄	0.0	0.0	0.0	0.0	0.0	0.0	0.0	/	/	/	/	0.0
Remarks/Weather	Overcast with drizzle and occasional light rain. Still and mild.						CO ppm	Max:	0	H ₂ S ppm	Max:	0
								Min:	0		Min:	0
Well No	WLS02	Atm Press mb temp °C	1011	Time of Reading	Flow l/hr	Max:	0.0	Diff Pressure (Pa)	Max:	0		
			17			Min:	0.0		Min:	0		
Well Depth (m)	2.53	Groundwater level from GL (m)	Dry	1150	VOC ppm	Max:	0.0	LEL %	Max:	/		
						Min:	0.0		Min:	/		
	Time (Seconds)											
	30	60	90	120	180	240	300	360	420	480	540	600
O ₂	19.1	19.0	18.9	18.8	18.7	18.6	18.5	18.5	18.5	18.5	/	/
CO ₂	1.8	1.8	1.9	1.9	2.1	2.2	2.3	2.3	2.3	2.3	/	/
CH ₄	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	/	/
Remarks/Weather	Overcast with drizzle and occasional light rain. Still and mild.						CO ppm	Max:	0	H ₂ S ppm	Max:	0
								Min:	0		Min:	0
Well No	WLS03	Atm Press mb temp °C	1012	Time of Reading	Flow l/hr	Max:	0.0	Diff Pressure (Pa)	Max:	0		
			17			Min:	0.0		Min:	0		
Well Depth (m)	3.05	Groundwater level from GL (m)	1.95	1140	VOC ppm	Max:	0.0	LEL %	Max:	/		
						Min:	0.0		Min:	/		
	Time (Seconds)											
	30	60	90	120	180	240	300	360	420	480	540	600
O ₂	20.5	20.0	20.0	20.0	19.9	19.9	19.9	/	/	/	/	/
CO ₂	0.5	0.5	0.5	0.5	0.6	0.6	0.7	/	/	/	/	/
CH ₄	0.0	0.0	0.0	0.0	0.0	0.0	0.0	/	/	/	/	/
Remarks/Weather	Overcast with drizzle and occasional light rain. Still and mild.						CO ppm	Max:	0	H ₂ S ppm	Max:	0
								Min:	0		Min:	0



Project Name		Project No		Tech		Date		Equipment Used				
Kerswell Close, Tottenham		J15567		SKT		12 October 2023		GFM436: S/N 10743 TIGER: S/N A-861240				
Well No	WLS04	Atm Press	mb	1013	Flow l/hr	Max:	0.0	Diff Pressure (Pa)	Max:	0		
				17			0.0			Min:	0	
Well Depth (m)	3.05	Groundwater level from GL (m)	0.83	VOC ppm	Max:	0.0	LEL %	Max:	/			
						Min:			0.0	Min:	/	
	Time (Seconds)											
	30	60	90	120	180	240	300	360	420	480	540	600
O ₂	20.0	19.8	20.0	20.1	20.1	20.2	20.3	/	/	/	/	/
CO ₂	0.4	0.0	0.0	0.0	0.0	0.0	0.0	/	/	/	/	/
CH ₄	0.0	0.0	0.0	0.0	0.0	0.0	0.0	/	/	/	/	/
Remarks/Weather	Overcast with drizzle and occasional light rain. Still and mild.						CO ppm	Max:	0	H ₂ s ppm	Max:	0
									Min:			0
Pressure Trend Before Visit: Stable/falling slightly.												

APPENDIX E

Photographs





Plate 1: Looking south across the carpark on the north of the site.



Plate 2: Northeast corner of the site.



Plate 3: Southeast side of the carpark.



Plate 4: South side of the carpark.



Plate 5: Looking north from south of the carpark.



Plate 6: Soft landscaping on the southeast of the site.



Plate 7: As plate 6.



Plate 8: Tree Root Protection Area on the southeast of the site.



Plate 9: Looking northwest across the soft landscaped area.



Plate 10: As plate 9.



Plate 11: Area on the southwest of the site where the gas main has been repaired.



Plate 12: Made Ground/spoil from the repair of the gas main.



Plate 13: Southwest corner of the site.



Plate 14: Tree Protection Area on the southwest corner of the site.



Plate 15: Arisings from WLS01.



Plate 16: Arisings from WLS03.



Plate 17: Arisings from WLS04.



Plate 18: Arisings from HA01.



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