LAND NORTH OF CHURCHFIELDS, PUDDING LANE, BARLEY

Phase 2 Environmental Assessment

Prepared for: Hanson Services Limited

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1.0 Introduction

1.1 Appointment

In October 2017, SLR Consulting Limited (SLR) was commissioned by Hanson Services Limited (Hanson) to undertake a Phase 2 Environmental Site Assessment (ESA) of land to the north of Churchfields, Pudding Lane, Barley, Hertfordshire (the Site, Drawing 1) in support of a planning application for residential development.

1.2 Background

Hanson is proposing to develop the Site for residential use. The proposed scheme includes the construction of two dwellings with private gardens and parking spaces which is illustrated on the proposed development plan in Appendix 01. Redevelopment may include removal of waste soil from site.

SLR produced a Phase 1 Environmental Assessment report in October 2017 which identified a moderate risk to future residents from potentially unsuitable shallow soils and a low to moderate risk to future buildings and groundwater.

Therefore a Phase 2 Environmental Assessment was recommended to reduce uncertainty about the quality of shallow soil.

1.3 Objectives

The objective of this assessment is to:

- provide information on shallow soil conditions beneath the Site;
- assess the presence, nature, likely severity and extent of soil contamination which may be present beneath the Site;
- update the Phase 1 risk assessment; and
- provide the client with outline remediation recommendations together with laboratory chemical analysis of soils for waste disposal purposes.

1.4 Scope of Work

The scope of work for the Phase 2 ESA was devised by SLR and outlined in a proposal to Hanson Services Ltd dated 9th October 2017. The scope of work comprises:

- project management and health and safety planning;
- the excavation of six trial pits (TP1 – TP6);
- on site supervision by SLR of the trial pit investigation, including collection and screening of soil samples for volatile organic compounds (VOCs);
- environmental laboratory analysis of soil samples;
- generic quantitative risk assessment (GQRA); and
- reporting including update of the conceptual site model.

The fieldwork methodology is outlined in Appendix 02.

2.0 Site Details, Setting and History

Information from the Phase 1 ESA on site, use setting and history has been summarised below to provide context to the investigation.

2.1 Site Vicinity Description

Information has been obtained from Ordnance Survey (OS), Environment Agency (EA) and British Geological Survey (BGS) mapping, data supplied by Groundsure and from the Site visit. Table 2-1 summarises the Site details.

Table 2-1
Site Details

Address	Land north of Churchfields, Pudding Lane, Barley, SG8 8JU	
Site Location	Located on the southern side of Barley Village. The Site is accessed from Church End [road] approximately 150m to the north. National Grid Reference 540109, 238267 identifies the approximate Site location.	
Current Usage	Currently undergoing redevelopment works comprising clearance of former above ground structures.	
Site Facilities	No facilities identified.	
Surrounding Land Uses	North	Woodland
	East	Private gardens / grass meadow
	South	Grass meadow
	West	Residential

Table 2-2
Physical Site Features Summary

Physical Site Features Summary		
Geography and Geology	Topography & Gradient	The Site slopes down with a two metre fall from south to north.
	Elevation	Approximately 106m above Ordnance Datum (aOD).
	Superficial Geology	Mapping indicates a thin layer of superficial deposits of Lowestoft Formation – Diamicton, which is a gravelly clay, originally termed Boulder Clay.
	Solid Geology	Lewes Nodular Chalk Formation and Seaford Chalk Formation (undifferentiated) – chalk. The closest BGS borehole record is approximately 200m north-west which recorded chalk to a maximum depth[1] of 55m. Depth to groundwater was not recorded.
Hydrology and Hydrogeology	Surface Water	The closest is a pond approximately 150m south-west. No other surface water features identified within 500m.
	Surface Water Abstractions	None identified within 500m.
	Surface Water Sensitivity	Given the distance to the nearest surface water feature its sensitivity as a receptor is considered to be very low.
	Aquifer Status	The Lowestoft Formation Diamicton is classified as a Secondary Aquifer (as undifferentiated layers). The chalk solid geology is classified as a Principal Aquifer. BGS mapping indicates that groundwater in the chalk rests at approximately 50m aOD (approximately 55m depth) with a regional flow direction towards the north.
	Groundwater abstractions	The closest abstraction is approximately 1337m to the west of the Site used for direct transfer between sources.
	Source Protection Zones (SPZ)	The Site lies within an EA Source Protection Zone (SPZ) Zone 3. The SPZ relates to multiple abstractions in the region, the closest of which is 1.5km to the north.
	Groundwater sensitivity of superficial undifferentiated aquifer	Although superficial deposits are indicated beneath the Site, they are not considered to be of sufficient thickness to support local base flow to the nearest surface water courses. Therefore the groundwater sensitivity of the superficial aquifer is considered to be very low.
	Groundwater	Depth to groundwater is anticipated to be in excess of 55m in

[1] All depths in this report are expressed as metres below existing ground level unless stated otherwise.

Physical Site Features Summary		
	Sensitivity of deeper Principal Aquifer and SPZ	the chalk and no significant confining layer is thought to be present. The depth to groundwater would be expected to retard and attenuate the majority of contaminant impacts, however the site is located within a Zone 3 SPZ therefore groundwater sensitivity in the chalk is considered to be moderate.

2.2 Site History

The previous Phase 1 Desk Study report found that the Site was undeveloped from before the 1880s and was indicated to be allotment gardens from the early 20th Century. The Site was converted into a builder's yard between the 1950s and 1970s which included the burning of waste.

Surrounding potentially contaminative uses in the vicinity are limited to glass houses / plant nursery 40m south and a small infilled pond 50m from site, neither of which are considered to be potential sources of off-site contamination by virtue of the distance to site and small size of the pond feature.

2.3 Preliminary Risk Assessment

SLR's Phase 1 Environmental Assessment report in October 2017 identified a moderate risk to future residents from potentially unsuitable shallow soils and a low to moderate risk to future buildings and groundwater.

Given the proposed development as residential with private gardens, a Phase 2 intrusive site investigation was recommended.

3.0 INTRUSIVE INVESTIGATION

3.1 Introduction

The objective of the site investigation was to confirm shallow soil conditions at the site. Despite the findings of the preliminary risk assessment groundwater wells were not proposed at this stage due to the anticipated depth of deep groundwater (over 55m).

An SLR engineer attended site on 18th October 2017 to supervise the excavation of six trial pits using a mechanical excavator to a maximum depth of 2.6m. SLR's engineer logged the trial pits in general accordance with BSS5930:2015 and obtained representative soil samples for laboratory analysis. Trial pit locations are shown on Drawing 2 and details of the site investigation field work methodology are presented in Appendix 02.

3.2 Geology

Reference should be made to the trial pit logs in Appendix 03 for full details of the strata encountered by this investigation. A photographic record of the trial pits is presented as Appendix 04.

Made Ground

The Made Ground was described as brown silty clay containing variable proportions of sand and gravel. The gravel constituent was variable, with all locations finding quantities of brick, concrete and roofing tile within the soil with lesser proportions of clinker, metal, glass, wood and plastic.

The Made Ground extended to a maximum of 0.65m depth and was considered to represent natural ground that had been disturbed over time leading to the inclusion of man-made materials.

Natural Clay

Small quantities of what is thought to be natural clay soil containing gravel of flint were encountered on the eastern side of TP3 and below the Made Ground in TP2.

Chalk

Chalk was encountered below the surface layers from 0.40m depth and was described as an off-white, structureless weathered chalk soil, composed of predominantly chalk silt and clay with variable proportions of chalk gravel. The material was considered to represent the undifferentiated chalk formation.

3.3 Visible Asbestos Occurrence

Visible fragments of suspect asbestos containing material (ACM) were not identified during the trial pitting works. Further details on asbestos in soil are provided in the following sections of this report.

3.4 Visual and Olfactory Field Observations

Visual evidence of significant contaminant impact was not noted in any of the soil samples inspected and soil headspace readings were all below 5ppmv (parts per million by volume), which does not indicate the presence of significant concentrations of volatile organic compounds (VOCs, including the more volatile components of petrol and diesel). The soil headspace readings are recorded on the appended trial pit logs.

3.5 Groundwater Occurrence

Groundwater was not recorded in any of the trial pits. Photographs of water ponding in the base of the pits is as a result of heavy rainfall on the day of the site investigation.

4.0 Soil Quality

4.1 Chemical Analysis - Soils

SLR collected representative samples of soil which were submitted for chemical analysis for some or all of the analysis suites outlined in Table 4-1.

Table 4-1
Soil Analysis

Determinants	Made Ground Samples Tested	Natural Ground Samples Tested
PAH – US EPA 16 Speciated	4	-
Speciated petroleum hydrocarbons (TPH CWG)	-	2
BTEX / MTBE	-	2
Volatile Organic Compounds (VOC)	-	1
Metals	4	-
pH	4	-
Cyanide suite	4	-
Asbestos (presence/absence)	4	-

The soil analysis results are summarised in Appendix 05 and a copy of the laboratory test certificates is contained in Appendix 06.

4.2 Laboratory Analysis Results

4.2.1 Petroleum Hydrocarbons, BTEX and MTBE, VOCs

Petroleum hydrocarbons, BTEX and MTBE or VOCs were not detected in any of the soil samples tested.

4.2.2 Metals

Metals were detected at generally low concentrations in the four soil samples analysed with the single exception of an elevated concentration of lead within the sample of Made Ground from TP6 at 0.2m depth.

4.2.3 PAHs

PAHs were detected in two out of four soil samples analysed. The PAH concentrations in TP1 at 0.2m could be described as trace, at less than 0.6mg/kg total PAH, and the concentration within TP6 at 0.2m was low, at 11mg/kg sum PAH.

4.2.4 Asbestos

Asbestos was detected in two out of four soil samples screened for its presence. The laboratory detected free fibres of chrysotile and fragments of cement sheet in the surface samples of Made Ground from TP4 and TP6.

Subsequent quantification determined that the asbestos content was 50% by weight as fragments of asbestos cement sheet and less than 0.001% by weight free fibres of asbestos.

The asbestos results are also summarised on the soil data summary in Appendix 05 where the detections above the laboratory limit of detection (LOD) highlighted in red – this does not indicate a "GAC exceedance", as asbestos risk is not assessed using generic assessment criteria. The results are discussed further in the following Section on Assessment of Asbestos Risk.

5.0 GQRA Assessment

5.1.1 Human Health Assessment Methodology

The generic risk assessment criteria are drawn from several sources of guidance, some from non-statutory guidance and some informal. SLR uses a combination of assessment criteria that are currently available to assist in the screening of soil data prior to determining whether further action is required. The following assessment criteria have been used for the assessment of contaminant levels in soil:

- Soil Guideline Values – since March 2002, the Department for Environment, Food and Rural Affairs (Defra) and the Environment Agency have been involved in publishing a series of reports that provide a scientifically based framework for the assessment of risks to human health from land contamination;
- LQM/CIEH Generic Assessment Criteria (GAC) – Land Quality Management and the Chartered Institute of Environmental Health have published GACs derived following CLR technical guidance and using the Environment Agency's CLEA UK model;
- LQM/CIEH Suitable for Use Levels (S4ULs) – in 2015 Land Quality Management and the Chartered Institute of Environmental Health have published S4ULs derived following CLEA technical guidance and using the Environment Agency's CLEA UK model, with updated toxicological and exposure parameters and land uses following the publication of the draft C4SLs.
- SLR's own in-house screening criteria derived following CLR technical guidance using the CLEA UK model;
- CLAIRE / AGS / EIC Generic Assessment Criteria (GAC) – these institutions have published publically available GACs derived following CLR technical guidance and using the Environment Agency's CLEA UK model, and
- Category 4 Screening Levels (DEFRA).

The SGVs and GAC have been developed as a guide for regulators and developers; if the concentrations recorded on site are lower than the SGV / GAC it is generally accepted that the contaminants in question are present at acceptable concentrations which aren't capable of putting human health at significant risk - as long as the humans make normal use of the site. An exceedance of these values indicates to an assessor that soil contaminant concentrations need to be considered further. SGV / GACs combine both authoritative science and policy judgements.

The SGVs, GAC and S4ULs / C4SLs used have been derived using the CLEA model according to several typical land uses:

- Residential (with and without vegetable growth);
- Allotments;
- Commercial/Industrial;
- Public Open Space residential (POS1);
- Public Open space park (POS2).

The proposed development at the site is currently proposed as a residential land use. The proposed site layout in Appendix 01 indicates the site will comprise buildings, hardstanding and private gardens. The selected GAC for the Site are therefore for the residential land use including vegetable growth.

The individual sample results for each contaminant were compared to generic assessment criteria (GAC) comprised of published soil guideline values (SGVs) and screening criteria derived using CLEA UK. The GAC and their sources are detailed on the GAC screening sheets at Appendix 05, with samples exceeding the GAC highlighted in red.

The assessment indicates that the majority of the soils sampled are chemically suitable for a proposed residential setting with the exception of the shallow soil at location TP6 which contained a concentration of lead in excess of the GAC (660mg/kg against a GAC of 200mg/kg).

This indicates that the soil at this location is not suitable for use within residential gardens but could be suitable for use below buildings and hardstanding.

6.0 Assessment of Asbestos Risk

6.1.1 Background

Asbestos was detected as free phase ACM and as fibres detected in soil as free fibres of chrysotile (white asbestos).

Quantification was carried out and whilst the quantity of free fibres was below the laboratory detection limit of 0.001%, the soils contained fragments of ACM cement sheet containing chrysotile. The fragments were not large enough to be visible during the site investigation. SLR provides further information on the asbestos detections in the sections below.

Asbestos becomes a risk to human health if loose asbestos fibres are inhaled. There are four main diseases commonly associated with asbestos inhalation; namely:

- mesothelioma;
- lung cancer;
- asbestosis; and
- pleural thickening.

Asbestos is a Class 1 carcinogen and as such harm to human health could occur at any level of exposure. In practice however, elevated risk is present when a high level of exposure occurs and an individual breathes in high levels of asbestos fibres. The Health and Safety Executive (HSE) provides a variety of information in relation to working with asbestos and asbestos risks are controlled in the UK by the Control of Asbestos Regulations (CAR) 2012.

Risks associated with asbestos within soils or waste construction materials are less understood. Historically, reference is often made to an ageing ICRCL[2] threshold of 0.001%. In practice, and in SLR's experience, the actual risk present relates to the propensity for fibre release. Risks will generally be lower when the asbestos is bound in a firm matrix (such as asbestos cement) and where the soil is fine grained. Recently two joint industry working groups have looked at the issue of asbestos within soils and CIRIA has published a guide to managing asbestos risks in soil[3].

The most reliable way to determine "actual" risks from asbestos is to undertake asbestos air monitoring while the material is disturbed under controlled conditions. This can be undertaken by creating conditions that might reasonably be expected to occur in the future and is known as activity based sampling (ABS). It should be noted however that under the Control of Asbestos Regulations (CAR) 2012 there is some debate about whether this would constitute an intentional release of asbestos fibres and thus true ABS is not permitted in the UK. Trials of ABS under controlled conditions have been undertaken however this is a relatively new area of science and requires further testing to check its applicability to this type of scenario.

A distinction also needs to be made between short-term, acute asbestos exposure and longer term risks. Sites proposed for commercial development or where a predominance of building footprint or hard standing will be present usually represent no significant long-term risks to human health since the material is encapsulated. In such cases it is common for the possible presence of asbestos in Made Ground to be noted at the Site (similar

2 Interdepartmental Committee on the Remediation of Contaminated Land.
3 CIRIA, Asbestos in soil and made ground: a guide to understanding and managing risks 2014.

to an Asbestos Register prepared for a building) to inform contractors in the event sub-surface works are required. In some cases, clean corridors can be created to limit exposure to asbestos in the future if sub-surface works are required.

Short term risks during the construction phase of a development are a separate issue and one that can be managed with a combination of asbestos air monitoring, further soil testing, PPE/RPE and asbestos awareness training, as judged to be appropriate to a site.

6.1.2 Asbestos Analysis Results Discussion

The presence of ACM within the soils renders the soils unsuitable for use in a residential setting. In order to facilitate the development, the soils will need to be removed and / or isolated from end users of the development.

7.0 Conceptual Site Model

As part of the evaluation of the Site and in accordance with current best practice, the Site has been considered in terms of a Conceptual Site Model using the principles of a risk assessment comprising the potential Source – Pathway – Receptor model of potential contaminant linkages (Appendix 07).

Table 7-1 lists the potential sources, pathways and receptors identified at this site within the context of possible contaminant linkages, i.e. a situation where the source(s), pathway(s) and receptor(s) are all present at a site and therefore a real (as opposed to a perceived) risk of potential impact exists. Qualitative assessment has been completed according to the methodology set out in CIRIA C552[4].

SLR understands that the Site is proposed to be converted into residential end use and this assessment has been made in that context.

7.1 Sources

The 2012 statutory guidance for Part 2A of the Environmental Protection Act 1990 (EPA 1990), defines a Contaminant as:

"a substance which is in, on or under the land and which has the potential to cause harm or to cause pollution of controlled waters".

Sources of contaminants in this instance are limited to an isolated concentration of lead in one soil sample and asbestos with Made Ground.

7.2 Pathways

The 2012 statutory guidance for Part 2A of the Environmental Protection Act 1990 (EPA 1990) defines a pathway as:

"one or more routes or means by, or through, which a receptor: (a) is being exposed to, or affected by, a contaminant; or (b) could be exposed or affected".

Potential environmental fate and exposure pathways specific to the Site are:

- direct contact, ingestion or inhalation of contaminated soils and soil dust;
- leaching of contamination from soils via rainwater infiltration.

7.3 Receptors

The 2012 statutory guidance for Part 2A of the Environmental Protection Act 1990 (EPA 1990), defines a Receptor as:

"either (a) a living organism, a group of organisms, an ecological system or a piece of property which (i) is in a category listed in Table A as a type of receptor, and (ii) is being, or could be, harmed, by a contaminant; or (b) controlled waters which are being, or could be, polluted by a contaminant".

Potential receptors specific to the Site are:

[4] Contaminated Land Risk Assessment – A Guide to Good Practice. CIRIA C552. 2001

- Human health:
  - future Site users; and
  - adjacent residents 15m west.
  - Note that due to the fact that ground related risks during temporary activities will be governed by the Health and Safety at Work Act, construction workers and ground workers are not discussed further in this report as the risks should be addressed through normal construction industry practices.
- Groundwater:
  - chalk Principal Aquifer in Source Protection Zone 3 (groundwater at over 55m depth); and
  - secondary A aquifer within the superficial deposits.

Due to the distance to the nearest surface water feature (pond 150m south-west) this receptor has not been considered further.

Table 7-1
Conceptual Site Model – Qualitative Risk Assessment

Source	Pathway to Hazard	Receptors	Consequence of risk	Likelihood of Occurrence	Potential Risk	Notes
Metals (former builders yard)	Direct ingestion / inhalation of soil and soil dust Consumption of home grown vegetables	Future on-Site users	Health impact - Medium	Likely	MODERATE RISK	The lead concentration in one soil sample exceeded HH GAC within the Made Ground in an area of proposed private gardens. It is recommended that the Made Ground soil is removed where humans can disturb the soil and grow vegetables.
Asbestos (Made Ground)	Inhalation of dust	Future on-Site users, adjacent residents	Health impact - Medium	Likely	MODERATE RISK	Asbestos quantification showed that the percentage mass of fibres is below the 0.001% LOD however free phase ACM is present within the soil. It is recommended that the Made Ground soil is removed where humans can disturb the soil.
Metals (former builders yard)	Migration of impacted groundwater	Groundwater Impact to Low Sensitivity Superficial Deposits – Secondary Aquifer	Mild	Low likelihood	LOW	No significant thickness of superficial deposits was encountered, and no groundwater was encountered. Significant/widespread metal concentrations were not detected in shallow soil.

Source	Pathway to Hazard	Receptors	Consequence of risk	Likelihood of Occurrence	Potential Risk	Notes
Metals (former builders yard)	Leaching into groundwater	Groundwater Impact to High sensitivity chalk principal aquifer in SPZ Zone 3	Medium	Low likelihood	LOW	Groundwater within the chalk is anticipated to be in excess of 55m and significant/widespread metal concentrations were not detected in shallow soil.
OVERALL RISK APPRAISAL					**MODERATE RISK**	

8.0 Summary and Conclusions

8.1 Summary

The Site was previously allotment gardens before being converted into a builder's yard between the 1950s and 1970s which included the burning of waste.

The Site is located within a residential area with the closest residential properties located approximately 15m west.

Groundwater was not encountered during the site investigation in either superficial or solid geology. The superficial geology is largely absent or thin at this location and depth to groundwater within the chalk is thought to be about 55m. Groundwater sensitivity within the chalk is considered to be moderate. Despite the sensitivity of groundwater within the chalk, the groundwater is thought to be at a depth of approximately 55m and consequently at low risk of impact from surface contamination at the Site.

Made Ground soils were typically high in man-made material content such as tile, concrete, brick, plastic and metal. Analysis of Made Ground soil samples for a targeted range of contaminants shows no significantly elevated concentrations with the exception of lead which was detected in one soil sample at a concentration in excess of the screening criteria in the context of a residential development with plant uptake. Asbestos was detected in two soil samples as fragments of chrysotile asbestos cement and free fibres.

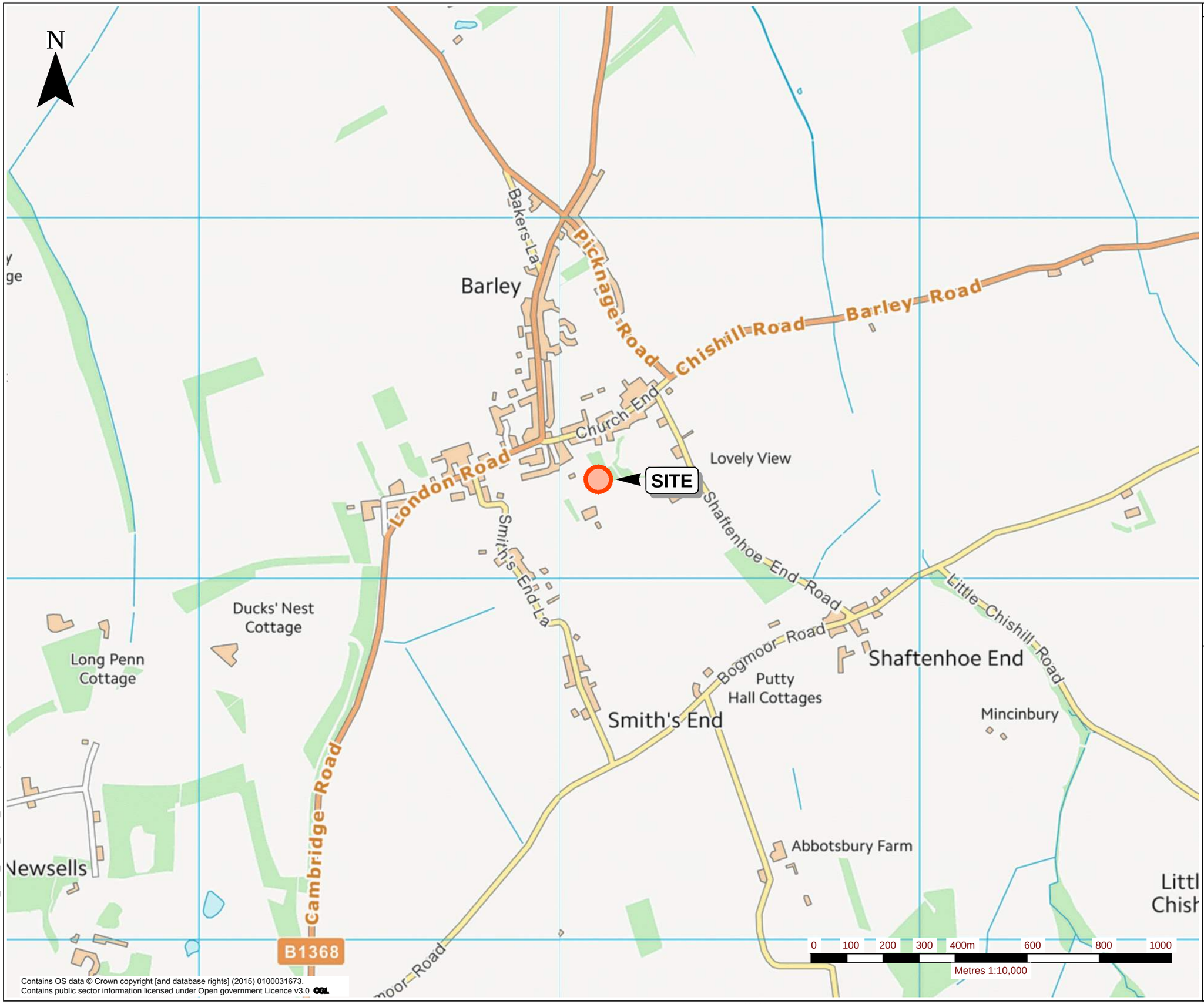
Analysis of soil samples for TPH did not detected hydrocarbons above the limit of detection and there was no evidence of hydrocarbon impact during the investigation.

8.2 Conclusions & Recommendations

The Made Ground materials are judged to be unsuitable for use in a residential setting with private gardens based on the asbestos detections, lead concentration and physical characteristics. Physical characteristics include fragments of brick, concrete, roof tiles, metal and plastic, and on this basis, it is recommended that the potential for direct contact with potentially impacted Made Ground is removed.

Where private gardens are proposed, Made Ground should be removed in its entirety and replaced with clean inert soil material that is suitable for the proposed planting scheme.

DRAWINGS



NOTES

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PHASE 2 ENVIRONMENTAL SITE ASSESSMENT

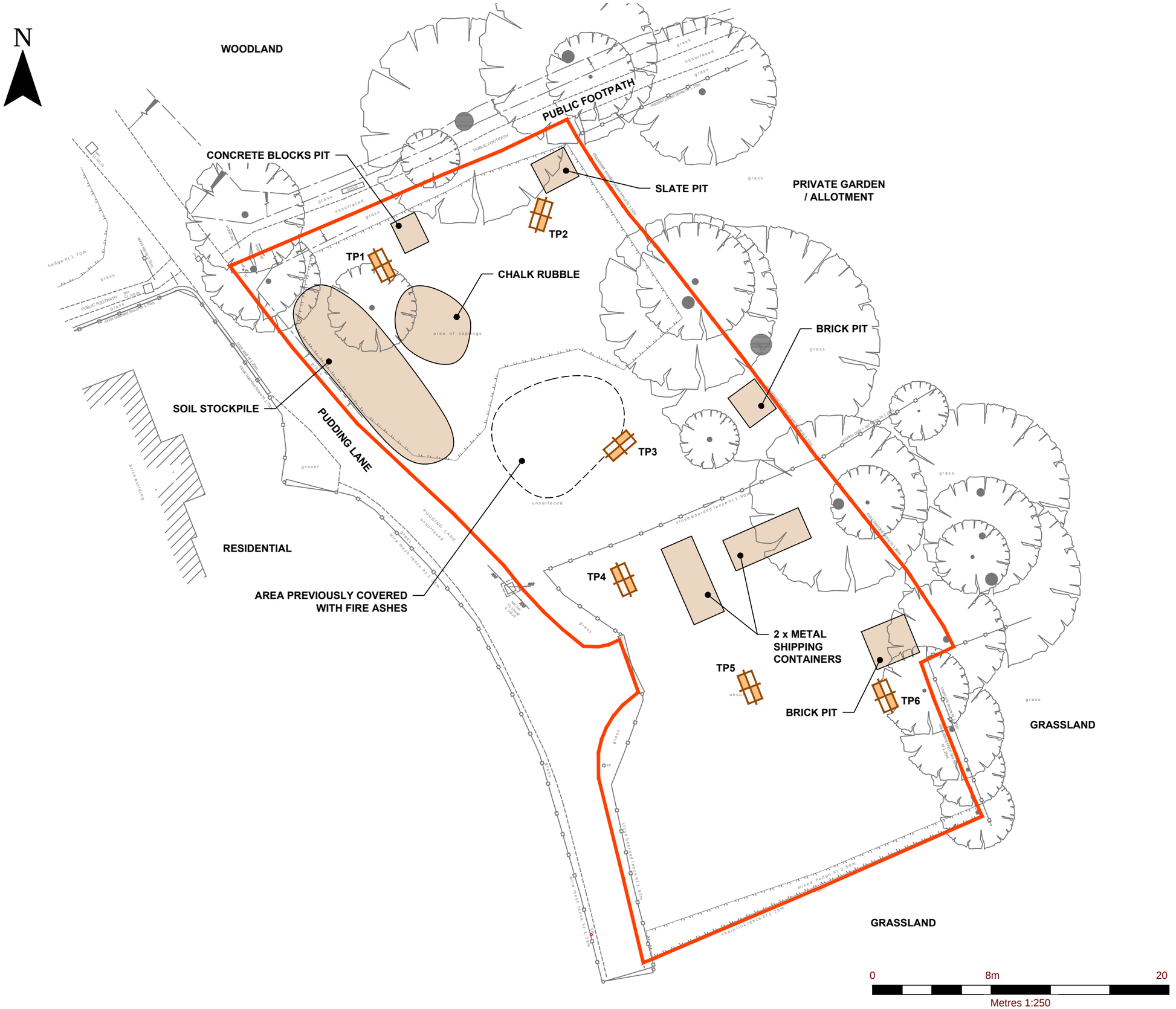
SITE LOCATION PLAN

DWG No. 1

Scale	Date
1:10,000 @ A3	OCTOBER 2017

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NOTES

1. DRAWING IS BASED ON TERRAIN LAND AND ARCHITECTURAL SURVEYORS, TOPOGRAPHICAL SURVEY, REFERENCE: TS16-119S/1, DATED: MARCH 2016.

LEGEND

SITE BOUNDARY

TRIAL PIT LOCATION

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BARLEY

PHASE 2 ENVIRONMENTAL SITE ASSESSMENT

TRIAL PIT LOCATION PLAN

DWG No. 2

Scale: 1:250 @ A3

Date: OCTOBER 2017

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APPENDIX 01

Proposed Development Plan



Existing road to be machine level reduced, lay & roll
MOT type1 sub-base to a depth not exceeding 100mm,
Lay and roll 20mm heavy duty macadam binder course
to a depth of 100mm.
Sweep clean the surface and spray with hot applied bitumen
emulsion with a 10mm golden gravel rolled in.
First 6M from public highway to be tarmac without gravel.
All suitable for 18T traffic.
Any footpath routes to be kept open during and after construction
An ongoing maintenance scheme to be set up to service road in perpetuity.

Scale 1:200 @ A2

SCALE BAR

No.	Date	Revision	Initial

Project

RESIDENTIAL DEVELOPMENT ON LAND AT PUDDING LANE, BARLEY, HERTS SG8 8JU

Client

HANSON SERVICES LTD

Drawing

PROPOSED SITE PLAN

Scale 1:200 @ A2 · Drawn C.R

Checked · Date June 16

Drawing No.

PUD/16/02C

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APPENDIX 02

Fieldwork Methodology

FIELD WORK

Principal Tasks

The Site works were undertaken in October 2017 and comprised the following main tasks:

- Review of public utility plans;
- six machine excavated trial pits;
- soil sampling and headspace screening; and
- submission of soil samples to an accredited laboratory.

Each of the above tasks is discussed below and the exploratory hole locations are shown on Drawing 2.

Utility Search

Public utility records were reviewed to ensure that trial pits were positioned clear of public underground services. All of the locations were screened with a cable avoidance tool to check for the presence of unrecorded services.

Machine Excavated Trial Pits

Eleven trial pits (TP1 to TP6) were excavated on 18th October 2017 by the combination of a 1.5 tonne tracked excavator or wheeled excavator with backhoe, under the supervision of SLR.

Soil Sampling

Soil samples from the trial pits were inspected and logged on site by a consultant from SLR. Samples were screened for volatile organic compounds (VOCs) using a MiniRae Lite Photo Ionisation Detector (PID) calibrated to isobutylene. A set of duplicate subsamples were also recovered for laboratory chemical analysis.

The results of the on-site screening are detailed on the trial pit logs.

Soil samples were selected for environmental laboratory analysis based on the following criteria:

- exhibited high head space screening values;
- visual or olfactory evidence of impact; or
- representative of different depths or lithologies.

Dedicated samples of Made Ground were submitted for laboratory analysis in separate laboratory supplied containers, using representative soil samples taken from a defined depth range.

No visual evidence of asbestos containing materials (ACMs) was identified in the soil therefore the analysis was targeted to surface soils with the greatest chance of disturbance by human activity. Sampling and laboratory analysis were broadly consistent with the 'Blue Book' method, comprising an initial screen followed by gross and detailed gravimetric quantification. Further details are available on request.

APPENDIX 03

Trial Pit Logs

TRIAL PIT LOG

TRIAL PIT No **TP1**

Client: **HANSON SERVICES**

Project: **PUDDING LANE, BARLEY**

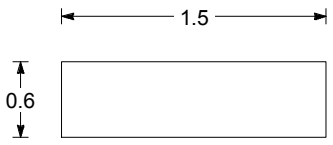
Project No:	Date:	Ground Level:	Co-ordinates:	Sheet:
408.05640.00021	18/10/17			1 of 1

SAMPLES & TESTS				Water	STRATA				Instrument/ Backfill
Depth	Type No	Test Type	Test Result (ppm)		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION	
0.00	D0-0.2						(0.40)	MADE GROUND: Friable brown slightly sandy, slightly gravelly silty CLAY. Gravel is angular to sub-rounded fine to coarse of concrete, brick and flint, rare clinker, ceramic, glass, metal, plastic. Frequent roots and rootlets.	
0.20	D	HS	3				0.40		
0.60	HS	HS	2				(0.85)	Very weak off-white structureless moderately to highly weathered CHALK. Composed of 15% gravel sized fragments of chalk within a silt/clay chalk matrix (Grade Dm).	
1.10	D	HS	3				1.25		
								Trial Pit complete at 1.20m	

GENERAL REMARKS:
1. Headspace readings recorded using a PID MiniRae Lite callibrated to isobutylene.
2. Trial pit backfilled upon completion.
3. Groundwater not encountered.

KEY:
V = Hand Vane Shear Strength
PP = Pocket Penetrometer Shear Strength
D = Small Disturbed Sample
B = Large Bulk Sample
HS = Head Space Measurement (ppm)

Trial Pit Dimensions:



Shoring/Support: None
Stability: Sides stable

All dimensions in metres	Contractor :	Method: Trial Pit/trench	Logged By:	Approved By:
Scale 1:25	Plant: Mechanical Excavator		EH	JH

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LOGGING HAS BEEN CARRIED OUT IN ACCORDANCE WITH BS5930 2015

TRIAL PIT LOG

TRIAL PIT No **TP2**

Client: **HANSON SERVICES**

Project: **PUDDING LANE, BARLEY**

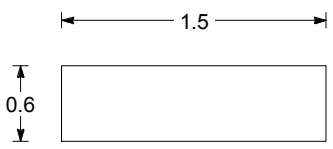
Project No:	Date:	Ground Level:	Co-ordinates:	Sheet:
408.05640.00021	18/10/17			1 of 1

SAMPLES & TESTS				Water	STRATA				Instrument/ Backfill
Depth	Type No	Test Type	Test Result (ppm)		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION	
0.00	D0-0.2						(0.30)	MADE GROUND: Friable brown slightly sandy, slightly gravelly silty CLAY. Gravel is angular to sub-rounded fine to coarse of concrete, brick and flint, rare clinker, ceramic, glass. Frequent roots and rootlets.	
0.20	D	HS	1				0.30		
							0.40	Soft to firm yellowish brown slightly sandy slightly gravelly CLAY. Gravel is fine to medium subangular flint.	
0.50	D	HS	1					Very weak off-white structureless moderately to highly weathered CHALK. Composed of 25% gravel sized fragments of chalk within a silt/clay chalk matrix (Grade Dm). Occasional orange staining on surfaces.	
1.00	HS	HS	2				(1.20)	1.10 - 1.20 Flint cobbles	
1.50	HS	HS	2				1.60		
								Trial Pit complete at 1.60m	

GENERAL REMARKS:
1. Headspace readings recorded using a PID MiniRae Lite callibrated to isobutylene.
2. Trial pit backfilled upon completion.
3. Groundwater not encountered.

KEY:
V = Hand Vane Shear Strength
PP = Pocket Penetrometer Shear Strength
D = Small Disturbed Sample
B = Large Bulk Sample
HS = Head Space Measurement (ppm)

Trial Pit Dimensions:



Shoring/Support: None
Stability: Sides stable

All dimensions in metres	Contractor :	Method: Trial Pit/trench	Logged By:	Approved By:
Scale 1:25	Plant: Mechanical Excavator		EH	JH

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LOGGING HAS BEEN CARRIED OUT IN ACCORDANCE WITH BS5930 2015

TRIAL PIT LOG

TRIAL PIT No **TP3**

Client: **HANSON SERVICES**

Project: **PUDDING LANE, BARLEY**

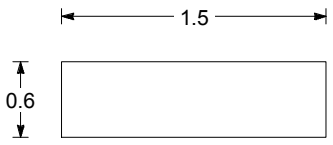
Project No:	Date:	Ground Level:	Co-ordinates:	Sheet:
408.05640.00021	18/10/17			1 of 1

SAMPLES & TESTS				Water	STRATA				Instrument/ Backfill
Depth	Type No	Test Type	Test Result (ppm)		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION	
0.00	D0-0.2						(0.40)	MADE GROUND: Friable brown slightly sandy, slightly gravelly silty CLAY. Gravel is angular to sub-rounded fine to coarse of concrete, brick and flint, rare clinker, ceramic. Frequent roots and rootlets.	
0.20	D	HS	1				0.40		
0.40	HS	HS	<1					Very weak off-white structureless moderately to highly weathered CHALK. Composed of 15% gravel sized fragments of chalk within a silt/clay chalk matrix (Grade Dm).	
0.70	HS	HS	1					0.40 - 0.80 Horizon of firm yellowish brown CLAY in eastern side of pit.	
1									
1.30	HS	HS	2				(1.95)		
1.85	HS	HS	3					1.85 Orangish brown fine to medium sand infill (5cm pockets)	
2									
2.25	D	HS	3				2.35		
								Trial Pit complete at 2.35m	
3									

GENERAL REMARKS:
1. Headspace readings recorded using a PID MiniRae Lite callibrated to isobutylene.
2. Trial pit backfilled upon completion.
3. Groundwater not encountered.

KEY:
V = Hand Vane Shear Strength
PP = Pocket Penetrometer Shear Strength
D = Small Disturbed Sample
B = Large Bulk Sample
HS = Head Space Measurement (ppm)

Trial Pit Dimensions:



Shoring/Support: None
Stability: Sides stable

All dimensions in metres	Contractor :	Method: Trial Pit/trench	Logged By:	Approved By:
Scale 1:25	Plant: Mechanical Excavator		EH	JH

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LOGGING HAS BEEN CARRIED OUT IN ACCORDANCE WITH BS5930 2015

TRIAL PIT LOG

TRIAL PIT No **TP4**

Client: **HANSON SERVICES**

Project: **PUDDING LANE, BARLEY**

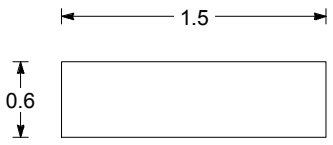
Project No:	Date:	Ground Level:	Co-ordinates:	Sheet:
408.05640.00021	18/10/17			1 of 1

SAMPLES & TESTS				Water	STRATA				Instrument/ Backfill
Depth	Type No	Test Type	Test Result (ppm)		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION	
0.00	D0-0.2								
0.20	D	HS	3				(0.40)	MADE GROUND: Friable brown slightly sandy, slightly gravelly silty CLAY. Gravel is angular to sub-rounded fine to coarse of brick, ceramic, concrete and flint, rare clinker.	
							0.40		
0.60	D	HS	3					Very weak off-white structureless moderately to highly weathered CHALK. Composed of 10% gravel sized fragments of chalk within a silt/clay chalk matrix (Grade Dm).	
1							(1.10)		
1.30	HS	HS	2						
							1.50		
								Trial Pit complete at 1.50m	
2									
3									

GENERAL REMARKS:
1. Headspace readings recorded using a PID MiniRae Lite callibrated to isobutylene.
2. Trial pit backfilled upon completion.
3. Groundwater not encountered.

KEY:
V = Hand Vane Shear Strength
PP = Pocket Penetrometer Shear Strength
D = Small Disturbed Sample
B = Large Bulk Sample
HS = Head Space Measurement (ppm)

Trial Pit Dimensions:



Shoring/Support: None
Stability: Sides stable

All dimensions in metres	Contractor :	Method: Trial Pit/trench	Logged By:	Approved By:
Scale 1:25	Plant: Mechanical Excavator		EH	JH

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LOGGING HAS BEEN CARRIED OUT IN ACCORDANCE WITH BS5930 2015

TRIAL PIT LOG

TRIAL PIT No **TP5**

Client: **HANSON SERVICES**

Project: **PUDDING LANE, BARLEY**

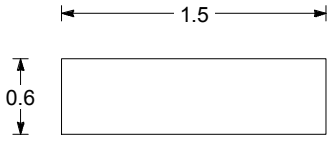
Project No:	Date:	Ground Level:	Co-ordinates:	Sheet:
408.05640.00021	18/10/17			1 of 1

SAMPLES & TESTS				Water	STRATA				Instrument/ Backfill
Depth	Type No	Test Type	Test Result (ppm)		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION	
0.00	D0-0.2						0.15	MADE GROUND: Yellowish brown, slightly clayey gravelly fine to coarse SAND. Gravel is fine to coarse, sub-angular to sub-rounded of brick, tile, concrete, glass. Frequent rootlets. Rare plastic fragments.	
0.40	D	HS	2				(0.50)	MADE GROUND: Friable brown slightly sandy slightly gravelly silty CLAY. Gravel is angular to sub-rounded fine to coarse of concrete, brick, flint, rare clinker and ceramic tile.	
							0.65		
1 1.00	D	HS	3					Firm yellowish brown slightly sandy slightly gravelly CLAY. Gravel is fine to coarse sub-rounded to rounded of flint.	
1.50	HS	HS	3				(1.25)		
							1.90		
2 2.10	D	HS	2					Very weak off-white structureless moderately to highly weathered CHALK. Composed of 20% gravel sized fragments of chalk within a silt/clay chalk matrix (Grade Dm).	
							(0.70)		
							2.60		
3								Trial Pit complete at 2.60m	

GENERAL REMARKS:
1. Headspace readings recorded using a PID MiniRae Lite callibrated to isobutylene.
2. Trial pit backfilled upon completion.
3. Groundwater not encountered.

KEY:
V = Hand Vane Shear Strength
PP = Pocket Penetrometer Shear Strength
D = Small Disturbed Sample
B = Large Bulk Sample
HS = Head Space Measurement (ppm)

Trial Pit Dimensions:



Shoring/Support: None
Stability: Sides stable

All dimensions in metres	Contractor :	Method: Trial Pit/trench	Logged By:	Approved By:
Scale 1:25	Plant: Mechanical Excavator		EH	JH

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LOGGING HAS BEEN CARRIED OUT IN ACCORDANCE WITH BS5930 2015

TRIAL PIT LOG

TRIAL PIT No **TP6**

Client: **HANSON SERVICES**

Project: **PUDDING LANE, BARLEY**

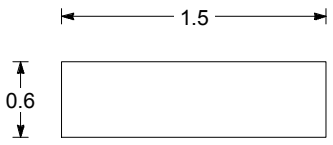
Project No:	Date:	Ground Level:	Co-ordinates:	Sheet:
408.05640.00021	18/10/17			1 of 1

SAMPLES & TESTS				Water	STRATA				Instrument/ Backfill
Depth	Type No	Test Type	Test Result (ppm)		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION	
0.00	D0-0.2						(0.40)	MADE GROUND: Friable brown slightly sandy, slightly gravelly silty CLAY. Gravel is angular to sub-rounded fine to coarse of concrete, flint, brick, tile, with rare wood and plastic. Frequent roots and rootlets.	
0.20	D	HS	1				0.40		
0.50	D	HS	3				(0.25)	Soft to firm yellowish brown slightly sandy slightly gravelly CLAY. Gravel is fine to coarse, sub-angular to rounded of chalk and flint.	
							0.65		
1 1.00	HS	HS	2				(0.95)	Very weak off-white structureless moderately to highly weathered CHALK. Composed of 15% gravel sized fragments of chalk within a silt/clay chalk matrix (Grade Dm).	
1.50	HS	HS	2				1.60		
								Trial Pit complete at 1.60m	
2									
3									

GENERAL REMARKS:
1. Headspace readings recorded using a PID MiniRae Lite callibrated to isobutylene.
2. Trial pit backfilled upon completion.
3. Groundwater not encountered.

KEY:
V = Hand Vane Shear Strength
PP = Pocket Penetrometer Shear Strength
D = Small Disturbed Sample
B = Large Bulk Sample
HS = Head Space Measurement (ppm)

Trial Pit Dimensions:



Shoring/Support: None
Stability: Sides stable

All dimensions in metres	Contractor :	Method: Trial Pit/trench	Logged By:	Approved By:
Scale 1:25	Plant: Mechanical Excavator		EH	JH

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LOGGING HAS BEEN CARRIED OUT IN ACCORDANCE WITH BS5930 2015

APPENDIX 04

Photographs



Plate 1. Trial Pit 1.

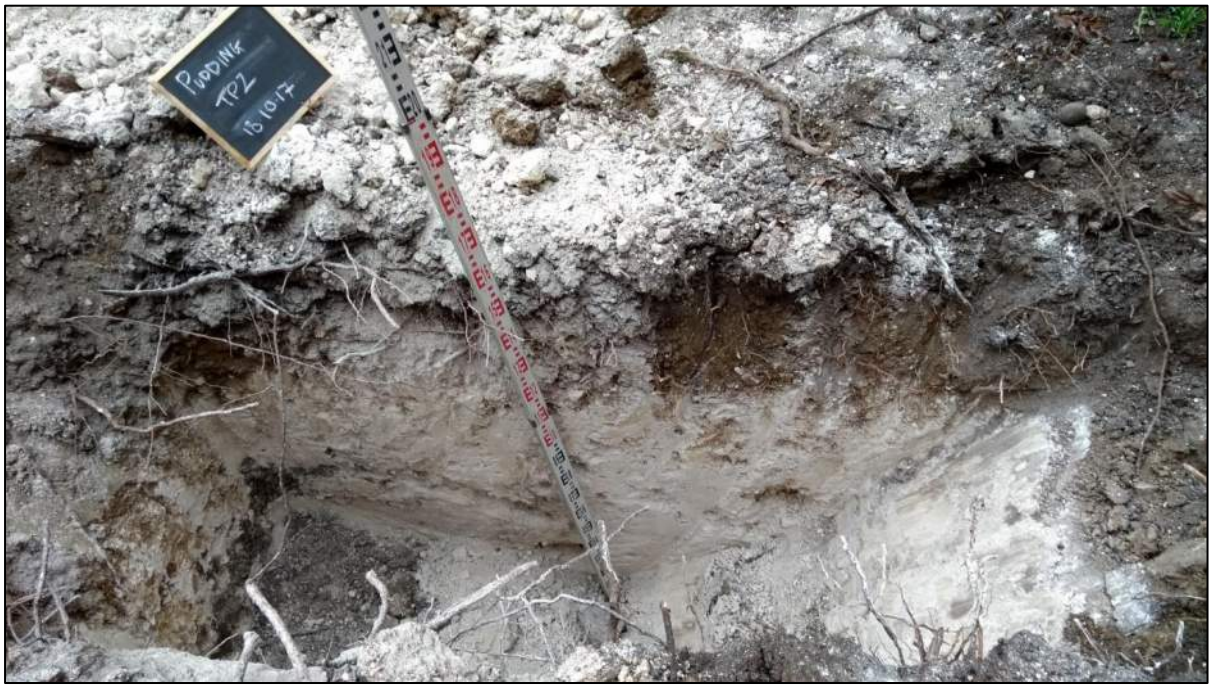


Plate 2. Trial Pit 2.



Plate 3. Trial Pit 2.



Plate 4. Trial Pit 3.



Plate 5. Trial Pit 3.



Plate 6. Trial Pit 4.



Plate 7. Trial Pit 4.



Plate 8. Trial Pit 5.



Plate 9. Trial Pit 5.



Plate 10. Trial Pit 6.



Plate 11. Trial Pit 6.

APPENDIX 05

Soil Analysis Summary

Generic Risk Assessment - Soils
Lab Data Screening

SLR

Exceeds GAC
Exceeds LOD

Client Name	Hanson Services
Site Name	Pudding Lane
Job Number	408.05640.00021
Date	31/10/2017
Description of Data Assessment / Zoning	Whole Site
Selected Screening Value and Land Use	GAC - Residential With Plant Uptake

Test	**Units**	**LOD**	**Selected GAC**	**No. Above GAC**	**Sample ID**	TP1	TP1	TP2	TP2	TP3	TP4	TP4	TP5	TP6	TP6
					Depth	0.00-0.20	0.2	0.00-0.20	0.5	2.25	0.00-0.20	0.6	2.1	0.00-0.20	0.2
					Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
					Sampled Date	18/10/2017	18/10/2017	18/10/2017	18/10/2017	18/10/2017	18/10/2017	18/10/2017	18/10/2017	18/10/2017	18/10/2017
					Sample Received Date	21/10/2017	21/10/2017	21/10/2017	21/10/2017	21/10/2017	21/10/2017	21/10/2017	21/10/2017	21/10/2017	21/10/2017
					J E Sample No	1	2-3	6	9-10	14-15	16	19-20	26-27	28	29-30
					Batch Number	1	1	1	1	1	1	1	1	1	1
					Strata / Zone	Whole Site	Whole Site	Whole Site	Whole Site	Whole Site	Whole Site	Whole Site	Whole Site	Whole Site	Whole Site
Metals						-	-	-	-	-	-	-	-	-	-
Arsenic	mg/kg	<0.5	32	0		-	14	-	2.5	-	-	1.9	-	-	17
Cadmium	mg/kg	<0.1	3	0		-	0.2	-	<0.1	-	-	<0.1	-	-	0.6
Chromium	mg/kg	<0.5	3000	0		-	38	-	9	-	-	6	-	-	46
Hexavalent Chromium	mg/kg	<0.3	4.3	0		-	<0.3	-	<0.3	-	-	<0.3	-	-	<0.3
Copper	mg/kg	<1	2330	0		-	21	-	4	-	-	2	-	-	47
Lead	mg/kg	<5	200	**1**		-	57	-	<5	-	-	<5	-	-	660
Mercury	mg/kg	<0.1	170	0		-	<0.1	-	<0.1	-	-	<0.1	-	-	<0.1
Nickel	mg/kg	<0.7	130	0		-	24	-	5.4	-	-	2.8	-	-	26
Selenium	mg/kg	<1	350	0		-	<1	-	<1	-	-	<1	-	-	<1
Zinc	mg/kg	<5	3750	0		-	86	-	21	-	-	11	-	-	470
pH	pH units	<0.01				-	8.2	-	8.5	-	-	9.0	-	-	8.1
						-	-	-	-	-	-	-	-	-	-
Cyanides						-	-	-	-	-	-	-	-	-	-
Free Cyanide	mg/kg	<0.5	55	0		-	<0.5	-	<0.5	-	-	<0.5	-	-	<0.5
Total Cyanide	mg/kg	<0.5	55	0		-	<0.5	-	<0.5	-	-	<0.5	-	-	1.9
Thiocyanate	mg/kg	<0.6				-	<0.6	-	<0.6	-	-	<0.6	-	-	<0.6
						-	-	-	-	-	-	-	-	-	-
Asbestos Screen & Quantification						-	-	-	-	-	-	-	-	-	-
General Description (Bulk Analysis) #	None	-	-			soil/stones	-	soil/stones	-	-	soil/stones	-	-	soil/stones	-
Asbestos Fibres #	None	-	-			NAD	-	NAD	-	-	Free Fibres	-	-	Free Fibres	-
Asbestos Fibres (2) #	None	-	-			NAD	-	NAD	-	-	-	-	-	-	-
Asbestos ACM #	None	-	-			NAD	-	NAD	-	-	Asbestos Cement	-	-	Asbestos Cement	-
Asbestos ACM (2) #	None	-	-			NAD	-	NAD	-	-	-	-	-	-	-
Asbestos Type #	None	-	-			NAD	-	NAD	-	-	Chrysotile	-	-	Chrysotile	-
Asbestos Type (2) #	None	-	-			NAD	-	NAD	-	-	-	-	-	-	-
Total ACM Gravimetric Quantification	%	0.001				NAD	-	NAD	-	-	50	-	-	50	-
Total Detailed Gravimetric Quantification	%	0.001				NAD		NAD			<0.001			<0.001	
						-	-	-	-	-	-	-	-	-	-

Generic Risk Assessment - Soils
Lab Data Screening

SLR

Exceeds GAC
Exceeds LOD

Client Name	Hanson Services
Site Name	Pudding Lane
Job Number	408.05640.00021
Date	31/10/2017
Description of Data Assessment / Zoning	Whole Site
Selected Screening Value and Land Use	GAC - Residential With Plant Uptake

Sample ID					TP1	TP1	TP2	TP2	TP3	TP4	TP4	TP5	TP6	TP6
Depth					0.00-0.20	0.2	0.00-0.20	0.5	2.25	0.00-0.20	0.6	2.1	0.00-0.20	0.2
Sample Type					Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
Sampled Date					18/10/2017	18/10/2017	18/10/2017	18/10/2017	18/10/2017	18/10/2017	18/10/2017	18/10/2017	18/10/2017	18/10/2017
Sample Received Date					21/10/2017	21/10/2017	21/10/2017	21/10/2017	21/10/2017	21/10/2017	21/10/2017	21/10/2017	21/10/2017	21/10/2017
J E Sample No					1	2-3	6	9-10	14-15	16	19-20	26-27	28	29-30
Batch Number					1	1	1	1	1	1	1	1	1	1
Strata / Zone					Whole Site	Whole Site	Whole Site	Whole Site	Whole Site	Whole Site	Whole Site	Whole Site	Whole Site	Whole Site
PAH MS					-	-	-	-	-	-	-	-	-	-
Naphthalene	mg/kg	<0.04	1.5	0	-	<0.04	-	<0.04	-	-	<0.04	-	-	<0.04
Acenaphthylene	mg/kg	<0.03	170	0	-	<0.03	-	<0.03	-	-	<0.03	-	-	<0.03
Acenaphthene	mg/kg	<0.05	210	0	-	<0.05	-	<0.05	-	-	<0.05	-	-	<0.05
Fluorene	mg/kg	<0.04	160	0	-	<0.04	-	<0.04	-	-	<0.04	-	-	<0.04
Phenanthrene	mg/kg	<0.03	92	0	-	0.05	-	<0.03	-	-	<0.03	-	-	1.2
Anthracene	mg/kg	<0.04	2300	0	-	<0.04	-	<0.04	-	-	<0.04	-	-	0.39
Fluoranthene	mg/kg	<0.03	260	0	-	0.1	-	<0.03	-	-	<0.03	-	-	1.7
Pyrene	mg/kg	<0.03	560	0	-	0.08	-	<0.03	-	-	<0.03	-	-	1.7
Benzo(a)anthracene	mg/kg	<0.06	3.1	0	-	0.1	-	<0.06	-	-	<0.06	-	-	0.95
Chrysene	mg/kg	<0.02	6	0	-	0.05	-	<0.02	-	-	<0.02	-	-	0.97
Benzo(bk)fluoranthene	mg/kg	<0.07			-	<0.07	-	<0.07	-	-	<0.07	-	-	1.7
Benzo(a)pyrene	mg/kg	<0.04	0.83	0	-	0.06	-	<0.04	-	-	<0.04	-	-	0.81
Indeno(123cd)pyrene	mg/kg	<0.04	3.2	0	-	<0.04	-	<0.04	-	-	<0.04	-	-	0.56
Dibenzo(ah)anthracene	mg/kg	<0.04	0.76	0	-	<0.04	-	<0.04	-	-	<0.04	-	-	<0.04
Benzo(ghi)perylene	mg/kg	<0.04	44	0	-	<0.04	-	<0.04	-	-	<0.04	-	-	0.74
PAH 16 Total	mg/kg	<0.6			-	<0.6	-	<0.6	-	-	<0.6	-	-	10.7
Benzo(b)fluoranthene	mg/kg	<0.05	5.6	0	-	<0.05	-	<0.05	-	-	<0.05	-	-	1.2
Benzo(k)fluoranthene	mg/kg	<0.02	8.5	0	-	<0.02	-	<0.02	-	-	<0.02	-	-	0.48
					-	-	-	-	-	-	-	-	-	-
BTEX/MTBE					-	-	-	-	-	-	-	-	-	-
					-	-	-	-	-	-	-	-	-	-
Methyl Tertiary Butyl Ether	mg/kg	<0.006	49	0	-	-	-	-	<0.006	-	-	<0.006	-	-
Benzene	mg/kg	<0.005	0.079	0	-	-	-	-	<0.005	-	-	<0.005	-	-
Toluene	mg/kg	<0.003	119	0	-	-	-	-	<0.005	-	-	<0.003	-	-
Ethylbenzene	mg/kg	<0.003	65	0	-	-	-	-	<0.005	-	-	<0.003	-	-
m & p Xylene	mg/kg	<0.004	42	0	-	-	-	-	<0.005	-	-	<0.004	-	-
o-Xylene	mg/kg	<0.004	42	0	-	-	-	-	<0.005	-	-	<0.004	-	-
					-	-	-	-	-	-	-	-	-	-
TPH CWG					-	-	-	-	-	-	-	-	-	-
Aliphatics					-	-	-	-	-	-	-	-	-	-
aliphatics >C5-C6	mg/kg	<0.1	30	0	-	-	-	-	<0.1	-	-	<0.1	-	-
aliphatics >C6-C8	mg/kg	<0.1	73	0	-	-	-	-	<0.1	-	-	<0.1	-	-
aliphatics >C8-C10	mg/kg	<0.1	19	0	-	-	-	-	<0.1	-	-	<0.1	-	-
aliphatics >C10-C12	mg/kg	<0.2	93	0	-	-	-	-	<0.2	-	-	<0.2	-	-
aliphatics >C12-C16	mg/kg	<4	740	0	-	-	-	-	<4	-	-	<4	-	-
aliphatics >C16-C21	mg/kg	<7	45000	0	-	-	-	-	<7	-	-	<7	-	-
aliphatics >C21-C35	mg/kg	<7	45000	0	-	-	-	-	<7	-	-	<7	-	-
Total aliphatics C5-35	mg/kg	<19			-	-	-	-	<19	-	-	<19	-	-
Aromatics					-	-	-	-	-	-	-	-	-	-
aromatics >EC5-EC7	mg/kg	<0.1	65	0	-	-	-	-	<0.1	-	-	<0.1	-	-
aromatics >EC7-EC8	mg/kg	<0.1	120	0	-	-	-	-	<0.1	-	-	<0.1	-	-
aromatics >EC8-EC10	mg/kg	<0.1	27	0	-	-	-	-	<0.1	-	-	<0.1	-	-
aromatics >EC10-EC12	mg/kg	<0.2	69	0	-	-	-	-	<0.2	-	-	<0.2	-	-
aromatics >EC12-EC16	mg/kg	<4	140	0	-	-	-	-	<4	-	-	<4	-	-
aromatics >EC16-EC21	mg/kg	<7	250	0	-	-	-	-	<7	-	-	<7	-	-
aromatics >EC21-EC35	mg/kg	<7	890	0	-	-	-	-	<7	-	-	<7	-	-
Total aromatics C5-35	mg/kg	<19			-	-	-	-	<19	-	-	<19	-	-
Total aliphatics and aromatics(C5-35)	mg/kg	<38			-	-	-	-	<38	-	-	<38	-	-
					-	-	-	-	-	-	-	-	-	-

Generic Risk Assessment - Soils
Lab Data Screening

SLR

Exceeds GAC
Exceeds LOD

Client Name	Hanson Services
Site Name	Pudding Lane
Job Number	408.05640.00021
Date	31/10/2017
Description of Data Assessment / Zoning	Whole Site
Selected Screening Value and Land Use	GAC - Residential With Plant Uptake

Sample ID					TP1	TP1	TP2	TP2	TP3	TP4	TP4	TP5	TP6	TP6
Depth					0.00-0.20	0.2	0.00-0.20	0.5	2.25	0.00-0.20	0.6	2.1	0.00-0.20	0.2
Sample Type					Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
Sampled Date					18/10/2017	18/10/2017	18/10/2017	18/10/2017	18/10/2017	18/10/2017	18/10/2017	18/10/2017	18/10/2017	18/10/2017
Sample Received Date					21/10/2017	21/10/2017	21/10/2017	21/10/2017	21/10/2017	21/10/2017	21/10/2017	21/10/2017	21/10/2017	21/10/2017
J E Sample No					1	2-3	6	9-10	14-15	16	19-20	26-27	28	29-30
Batch Number					1	1	1	1	1	1	1	1	1	1
Strata / Zone					Whole Site	Whole Site	Whole Site	Whole Site	Whole Site	Whole Site	Whole Site	Whole Site	Whole Site	Whole Site
					-	-	-	-	-	-	-	-	-	-
VOC MS					-	-	-	-	-	-	-	-	-	-
Dichlorodifluoromethane	mg/kg	<0.002	-	0	-	-	-	-	-	-	-	<0.002	-	-
Methyl Tertiary Butyl Ether	mg/kg	<0.006	49	0	-	-	-	-	-	-	-	<0.006	-	-
Chloromethane	mg/kg	<0.003	0.0083	0	-	-	-	-	-	-	-	<0.003	-	-
Vinyl Chloride	mg/kg	<0.002	0.00047	0	-	-	-	-	-	-	-	<0.002	-	-
Bromomethane	mg/kg	<0.001	-	0	-	-	-	-	-	-	-	<0.001	-	-
Chloroethane	mg/kg	<0.006	8.3	0	-	-	-	-	-	-	-	<0.006	-	-
Trichlorofluoromethane	mg/kg	<0.003	-	0	-	-	-	-	-	-	-	<0.003	-	-
1,1-Dichloroethene	mg/kg	<0.006	-	0	-	-	-	-	-	-	-	<0.006	-	-
Dichloromethane	mg/kg	<0.03	0.58	0	-	-	-	-	-	-	-	<0.03	-	-
Trans-1-2-Dichloroethene	mg/kg	<0.003	0.19	0	-	-	-	-	-	-	-	<0.003	-	-
1,1-Dichloroethane	mg/kg	<0.006		0	-	-	-	-	-	-	-	<0.006	-	-
cis 1-2 dichloroethene	mg/kg	<0.007	0.11	0	-	-	-	-	-	-	-	<0.007	-	-
2,2-Dichloropropane	mg/kg	<0.004	-	0	-	-	-	-	-	-	-	<0.004	-	-
Bromochloromethane	mg/kg	<0.004			-	-	-	-	-	-	-	<0.004	-	-
Chloroform	mg/kg	<0.005			-	-	-	-	-	-	-	<0.005	-	-
1,1,1-Trichloroethane	mg/kg	<0.005	6.2	0	-	-	-	-	-	-	-	<0.005	-	-
1,1-Dichloropropene	mg/kg	<0.003	-	0	-	-	-	-	-	-	-	<0.003	-	-
Carbon Tetrachloride	mg/kg	<0.004	0.018	0	-	-	-	-	-	-	-	<0.004	-	-
1,2-Dichloroethane	mg/kg	<0.005	0.0054	0	-	-	-	-	-	-	-	<0.005	-	-
Benzene	mg/kg	<0.005	0.079	0	-	-	-	-	-	-	-	<0.005	-	-
Trichloroethene	mg/kg	<0.005	0.11	0	-	-	-	-	-	-	-	<0.005	-	-
1,2-Dichloropropane	mg/kg	<0.004	0.024	0	-	-	-	-	-	-	-	<0.004	-	-
Dibromomethane	mg/kg	<0.004	-	0	-	-	-	-	-	-	-	<0.004	-	-
Bromodichloromethane	mg/kg	<0.004	0.016	0	-	-	-	-	-	-	-	<0.004	-	-
Cis-1-3-Dichloropropene	mg/kg	<0.004	-	0	-	-	-	-	-	-	-	<0.004	-	-
Toluene	mg/kg	<0.003	119	0	-	-	-	-	-	-	-	<0.003	-	-
Trans-1-3-Dichloropropene	mg/kg	<0.003	-	0	-	-	-	-	-	-	-	<0.003	-	-
1,1,2-Trichloroethane	mg/kg	<0.004	-	0	-	-	-	-	-	-	-	<0.004	-	-
Tetrachloroethene	mg/kg	<0.003	0.94	0	-	-	-	-	-	-	-	<0.003	-	-
1,3-Dichloropropane	mg/kg	<0.004	-	0	-	-	-	-	-	-	-	<0.004	-	-
Dibromochloromethane	mg/kg	<0.005	-	0	-	-	-	-	-	-	-	<0.005	-	-
1,2-Dibromoethane	mg/kg	<0.003	-	0	-	-	-	-	-	-	-	<0.003	-	-
Chlorobenzene	mg/kg	<0.004	0.33	0	-	-	-	-	-	-	-	<0.004	-	-
1,1,1,2-Tetrachloroethane	mg/kg	<0.005	0.9	0	-	-	-	-	-	-	-	<0.005	-	-
Ethylbenzene	mg/kg	<0.003	65	0	-	-	-	-	-	-	-	<0.003	-	-
m & p Xylene	mg/kg	<0.004	42	0	-	-	-	-	-	-	-	<0.004	-	-
o-Xylene	mg/kg	<0.004	42	0	-	-	-	-	-	-	-	<0.004	-	-
Styrene	mg/kg	<0.003	8.1	0	-	-	-	-	-	-	-	<0.003	-	-
Bromoform	mg/kg	<0.004	2.8	0	-	-	-	-	-	-	-	<0.004	-	-
Isopropylbenzene	mg/kg	<0.003	11	0	-	-	-	-	-	-	-	<0.003	-	-
1,1,2,2-Tetrachloroethane	mg/kg	<0.003	1.4	0	-	-	-	-	-	-	-	<0.003	-	-
Bromobenzene	mg/kg	<0.002	0.87	0	-	-	-	-	-	-	-	<0.002	-	-
1,2,3-Trichloropropane	mg/kg	<0.004	-	0	-	-	-	-	-	-	-	<0.004	-	-
Propylbenzene	mg/kg	<0.004	34	0	-	-	-	-	-	-	-	<0.004	-	-
2-Chlorotoluene	mg/kg	<0.003	-	0	-	-	-	-	-	-	-	<0.003	-	-
1,3,5-Trimethylbenzene	mg/kg	<0.003	-	0	-	-	-	-	-	-	-	<0.003	-	-
4-Chlorotoluene	mg/kg	<0.003	-	0	-	-	-	-	-	-	-	<0.003	-	-
Tert-Butylbenzene	mg/kg	<0.005	-	0	-	-	-	-	-	-	-	<0.005	-	-
1,2,4-Trimethylbenzene	mg/kg	<0.006	0.35	0	-	-	-	-	-	-	-	<0.006	-	-
Sec-Butylbenzene	mg/kg	<0.004	-	0	-	-	-	-	-	-	-	<0.004	-	-
4-Isopropyltoluene	mg/kg	<0.004	-	0	-	-	-	-	-	-	-	<0.004	-	-
1,3-Dichlorobenzene	mg/kg	<0.004	0.29	0	-	-	-	-	-	-	-	<0.004	-	-
1,4-Dichlorobenzene	mg/kg	<0.004	30	0	-	-	-	-	-	-	-	<0.004	-	-
n-Butylbenzene	mg/kg	<0.004	-	0	-	-	-	-	-	-	-	<0.004	-	-
1,2-Dichlorobenzene	mg/kg	<0.004	16	0	-	-	-	-	-	-	-	<0.004	-	-
1,2-Dibromo-3-Chloropropane	mg/kg	<0.004	-	0	-	-	-	-	-	-	-	<0.004	-	-
1,2,4-Trichlorobenzene	mg/kg	<0.007	1.8	0	-	-	-	-	-	-	-	<0.007	-	-
Hexachlorobutadiene	mg/kg	<0.004	0.21	0	-	-	-	-	-	-	-	<0.004	-	-
Naphthalene	mg/kg	<0.027	1.5	0	-	-	-	-	-	-	-	<0.027	-	-
1,2,3-Trichlorobenzene	mg/kg	<0.007	1	0	-	-	-	-	-	-	-	<0.007	-	-

APPENDIX 06

Laboratory Test Certificates

Exova Jones Environmental

Registered Address : Exova (UK) Ltd, Lochend Industrial Estate, Newbridge, Midlothian, EH28 8PL

Unit 3 Deeside Point
Zone 3
Deeside Industrial Park
Deeside
CH5 2UA

Tel: +44 (0) 1244 833780
Fax: +44 (0) 1244 833781

SLR Consulting Ltd
8 Stow Court
Stow-Cum-Quy
Cambridge
CB25 9AS

4225

Attention :	Jeremy Head
Date :	31st October, 2017
Your reference :	408.05640.00021
Our reference :	Test Report 17/17411 Batch 1
Location :	Pudding Lane
Date samples received :	21st October, 2017
Status :	Final report
Issue :	1

Twenty samples were received for analysis on 21st October, 2017 of which eleven were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.
All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Compiled By:

Paul Boden BSc
Project Manager

Client Name: SLR Consulting Ltd
Reference: 408.05640.00021
Location: Pudding Lane
Contact: Jeremy Head
JE Job No.: 17/17411

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

J E Sample No.	2-3	9-10	14-15	19-20	26-27	29-30	33-35				LOD/LOR	Units	Method No.
Sample ID	TP1	TP2	TP3	TP4	TP5	TP6	WAC						
Depth	0.20	0.50	2.25	0.60	2.10	0.20							
COC No / misc													
Containers	V J	V J	V J	V J	V J	V J	V J T						
Sample Date	18/10/2017	18/10/2017	18/10/2017	18/10/2017	18/10/2017	18/10/2017	18/10/2017						
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil						
Batch Number	1	1	1	1	1	1	1						
Date of Receipt	21/10/2017	21/10/2017	21/10/2017	21/10/2017	21/10/2017	21/10/2017	21/10/2017						
Arsenic #M	14	2.5	-	1.9	-	17	9.6				<0.5	mg/kg	TM30/PM15
Cadmium #M	0.2	<0.1	-	<0.1	-	0.6	0.2				<0.1	mg/kg	TM30/PM15
Chromium #M	38	9.0	-	6.0	-	46	32				<0.5	mg/kg	TM30/PM15
Copper #M	21	4	-	2	-	47	16				<1	mg/kg	TM30/PM15
Lead #M	57	<5	-	<5	-	660	44				<5	mg/kg	TM30/PM15
Mercury #M	<0.1	<0.1	-	<0.1	-	<0.1	<0.1				<0.1	mg/kg	TM30/PM15
Nickel #M	24	5.4	-	2.8	-	26	16				<0.7	mg/kg	TM30/PM15
Selenium #M	<1	<1	-	<1	-	<1	<1				<1	mg/kg	TM30/PM15
Total Sulphate as SO4 #M	-	-	-	-	-	-	870				<50	mg/kg	TM50/PM29
Zinc #M	86	21	-	11	-	470	86				<5	mg/kg	TM30/PM15
PAH MS													
Naphthalene #M	<0.04	<0.04	-	<0.04	-	<0.04	<0.04				<0.04	mg/kg	TM4/PM8
Acenaphthylene	<0.03	<0.03	-	<0.03	-	<0.03	<0.03				<0.03	mg/kg	TM4/PM8
Acenaphthene #M	<0.05	<0.05	-	<0.05	-	<0.05	<0.05				<0.05	mg/kg	TM4/PM8
Fluorene #M	<0.04	<0.04	-	<0.04	-	<0.04	<0.04				<0.04	mg/kg	TM4/PM8
Phenanthrene #M	0.05	<0.03	-	<0.03	-	1.2	0.16				<0.03	mg/kg	TM4/PM8
Anthracene #	<0.04	<0.04	-	<0.04	-	0.39	<0.04				<0.04	mg/kg	TM4/PM8
Fluoranthene #M	0.10	<0.03	-	<0.03	-	1.7	0.38				<0.03	mg/kg	TM4/PM8
Pyrene #	0.08	<0.03	-	<0.03	-	1.7	0.33				<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	0.10	<0.06	-	<0.06	-	0.95	0.22				<0.06	mg/kg	TM4/PM8
Chrysene #M	0.05	<0.02	-	<0.02	-	0.97	0.20				<0.02	mg/kg	TM4/PM8
Benzo(bk)fluoranthene #M	<0.07	<0.07	-	<0.07	-	1.7	0.34				<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	0.06	<0.04	-	<0.04	-	0.81	0.17				<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene #M	<0.04	<0.04	-	<0.04	-	0.56	0.12				<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	<0.04	<0.04	-	<0.04	-	<0.04	<0.04				<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	<0.04	<0.04	-	<0.04	-	0.74	0.12				<0.04	mg/kg	TM4/PM8
Coronene	-	-	-	-	-	-	<0.04				<0.04	mg/kg	TM4/PM8
PAH 16 Total	<0.6	<0.6	-	<0.6	-	10.7	2.0				<0.6	mg/kg	TM4/PM8
Benzo(b)fluoranthene	<0.05	<0.05	-	<0.05	-	1.2	0.24				<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	<0.02	<0.02	-	<0.02	-	0.48	0.10				<0.02	mg/kg	TM4/PM8
PAH Surrogate % Recovery	89	72	-	87	-	83	84				<0	%	TM4/PM8
Methyl Tertiary Butyl Ether #M	-	-	-	-	<0.006	-	-				<0.006	mg/kg	TM15/PM10
Benzene #M	-	-	-	-	<0.005	-	-				<0.005	mg/kg	TM15/PM10
Toluene #M	-	-	-	-	<0.003	-	-				<0.003	mg/kg	TM15/PM10
Ethylbenzene #M	-	-	-	-	<0.003	-	-				<0.003	mg/kg	TM15/PM10
p/m-Xylene #M	-	-	-	-	<0.004	-	-				<0.004	mg/kg	TM15/PM10
o-Xylene #M	-	-	-	-	<0.004	-	-				<0.004	mg/kg	TM15/PM10
Surrogate Recovery Toluene D8	-	-	-	-	79	-	-				<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	-	-	-	-	110	-	-				<0	%	TM15/PM10
MTBE #	-	-	<0.005	-	-	-	<0.005				<0.005	mg/kg	TM31/PM12
Benzene #	-	-	<0.005	-	-	-	<0.005				<0.005	mg/kg	TM31/PM12

Please see attached notes for all abbreviations and acronyms

Client Name: SLR Consulting Ltd
Reference: 408.05640.00021
Location: Pudding Lane
Contact: Jeremy Head
JE Job No.: 17/17411

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

J E Sample No.	2-3	9-10	14-15	19-20	26-27	29-30	33-35				LOD/LOR	Units	Method No.
Sample ID	TP1	TP2	TP3	TP4	TP5	TP6	WAC						
Depth	0.20	0.50	2.25	0.60	2.10	0.20							
COC No / misc													
Containers	V J	V J	V J	V J	V J	V J	V J T						
Sample Date	18/10/2017	18/10/2017	18/10/2017	18/10/2017	18/10/2017	18/10/2017	18/10/2017						
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil						
Batch Number	1	1	1	1	1	1	1						
Date of Receipt	21/10/2017	21/10/2017	21/10/2017	21/10/2017	21/10/2017	21/10/2017	21/10/2017						
Toluene #	-	-	<0.005	-	-	-	<0.005				<0.005	mg/kg	TM31/PM12
Ethylbenzene #	-	-	<0.005	-	-	-	<0.005				<0.005	mg/kg	TM31/PM12
m/p-Xylene #	-	-	<0.005	-	-	-	<0.005				<0.005	mg/kg	TM31/PM12
o-Xylene #	-	-	<0.005	-	-	-	<0.005				<0.005	mg/kg	TM31/PM12
Xylenes (sum of isomers) #	-	-	<0.01	-	-	-	<0.01				<0.01	mg/kg	TM31/PM12
EPH (C8-C40) #M	-	-	-	-	-	-	150				<30	mg/kg	TM5/PM8
TPH CWG													
Aliphatics													
>C5-C6 #M	-	-	<0.1	-	<0.1	-	-				<0.1	mg/kg	TM36/PM12
>C6-C8 #M	-	-	<0.1	-	<0.1	-	-				<0.1	mg/kg	TM36/PM12
>C8-C10	-	-	<0.1	-	<0.1	-	-				<0.1	mg/kg	TM36/PM12
>C10-C12 #M	-	-	<0.2	-	<0.2	-	-				<0.2	mg/kg	TM5/PM16
>C12-C16 #M	-	-	<4	-	<4	-	-				<4	mg/kg	TM5/PM16
>C16-C21 #M	-	-	<7	-	<7	-	-				<7	mg/kg	TM5/PM16
>C21-C35 #M	-	-	<7	-	<7	-	-				<7	mg/kg	TM5/PM16
Total aliphatics C5-35	-	-	<19	-	<19	-	-				<19	mg/kg	TM5/TM36/PM12/PM16
Aromatics													
>C5-EC7 #	-	-	<0.1	-	<0.1	-	-				<0.1	mg/kg	TM36/PM12
>EC7-EC8 #	-	-	<0.1	-	<0.1	-	-				<0.1	mg/kg	TM36/PM12
>EC8-EC10 #M	-	-	<0.1	-	<0.1	-	-				<0.1	mg/kg	TM36/PM12
>EC10-EC12 #	-	-	<0.2	-	<0.2	-	-				<0.2	mg/kg	TM5/PM16
>EC12-EC16 #	-	-	<4	-	<4	-	-				<4	mg/kg	TM5/PM16
>EC16-EC21 #	-	-	<7	-	<7	-	-				<7	mg/kg	TM5/PM16
>EC21-EC35 #	-	-	<7	-	<7	-	-				<7	mg/kg	TM5/PM16
Total aromatics C5-35 #	-	-	<19	-	<19	-	-				<19	mg/kg	TM5/TM36/PM12/PM16
Total aliphatics and aromatics(C5-35)	-	-	<38	-	<38	-	-				<38	mg/kg	TM5/TM36/PM12/PM16
Total Phenols HPLC	-	-	-	-	-	-	<0.15				<0.15	mg/kg	TM26/PM21
Natural Moisture Content	18.2	18.8	21.4	27.1	22.8	18.9	16.2				<0.1	%	PM4/PM0
Hexavalent Chromium #	<0.3	<0.3	-	<0.3	-	<0.3	<0.3				<0.3	mg/kg	TM38/PM20
Free Cyanide	<0.5	<0.5	-	<0.5	-	<0.5	-				<0.5	mg/kg	TM89/PM45
Total Cyanide #M	<0.5	<0.5	-	<0.5	-	1.9	2.8				<0.5	mg/kg	TM89/PM45
Sample Type	Clay	Clay	Clay	Clay	Clay	Clay	Clay					None	PM13/PM0
Sample Colour	Medium Brown	White	White	Light Brown	Light Brown	Medium Brown	Medium Grey					None	PM13/PM0
Other Items	loam, stones, roots, wood	stones, chalk	stones, chalk	stones, chalk	stones, chalk	loam, roots, stones	chalk, stones					None	PM13/PM0

Please see attached notes for all abbreviations and acronyms

Client Name: SLR Consulting Ltd
Reference: 408.05640.00021
Location: Pudding Lane
Contact: Jeremy Head
JE Job No.: 17/17411

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

J E Sample No.	2-3	9-10	14-15	19-20	26-27	29-30	33-35				LOD/LOR	Units	Method No.
Sample ID	TP1	TP2	TP3	TP4	TP5	TP6	WAC						
Depth	0.20	0.50	2.25	0.60	2.10	0.20							
COC No / misc													
Containers	V J	V J	V J	V J	V J	V J	V J T						
Sample Date	18/10/2017	18/10/2017	18/10/2017	18/10/2017	18/10/2017	18/10/2017	18/10/2017						
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil						
Batch Number	1	1	1	1	1	1	1						
Date of Receipt	21/10/2017	21/10/2017	21/10/2017	21/10/2017	21/10/2017	21/10/2017	21/10/2017						
PAH MS													
PAH 17 Total	-	-	-	-	-	-	2.04				<0.64	mg/kg	TM4/PM8
Mineral Oil (C10-C40)	-	-	-	-	-	-	<30				<30	mg/kg	TM5/PM16
PCB 28 #	-	-	-	-	-	-	<0.005				<0.005	mg/kg	TM17/PM8
PCB 52 #	-	-	-	-	-	-	<0.005				<0.005	mg/kg	TM17/PM8
PCB 101 #	-	-	-	-	-	-	<0.005				<0.005	mg/kg	TM17/PM8
PCB 118 #	-	-	-	-	-	-	<0.005				<0.005	mg/kg	TM17/PM8
PCB 138 #	-	-	-	-	-	-	<0.005				<0.005	mg/kg	TM17/PM8
PCB 153 #	-	-	-	-	-	-	<0.005				<0.005	mg/kg	TM17/PM8
PCB 180 #	-	-	-	-	-	-	<0.005				<0.005	mg/kg	TM17/PM8
Total 7 PCBs #	-	-	-	-	-	-	<0.035				<0.035	mg/kg	TM17/PM8
Total Organic Carbon #	-	-	-	-	-	-	0.96				<0.02	%	TM21/PM24
Sulphide	-	-	-	-	-	-	<10				<10	mg/kg	TM106/PM119
Thiocyanate	<0.6	<0.6	-	<0.6	-	<0.6	-				<0.6	mg/kg	TM107/PM119
pH #M	8.2	8.5	-	9.0	-	8.1	8.1				<0.01	pH units	TM73/PM11

Please see attached notes for all abbreviations and acronyms

Client Name: SLR Consulting Ltd
Reference: 408.05640.00021
Location: Pudding Lane
Contact: Jeremy Head
JE Job No.: 17/17411

VOC Report : **Solid**

J E Sample No.	26-27												
Sample ID	TP5												
Depth	2.10												
COC No / misc													
Containers	V J												
Sample Date	18/10/2017												
Sample Type	Soil												
Batch Number	1												
Date of Receipt	21/10/2017												

Please see attached notes for all abbreviations and acronyms

											LOD/LOR	Units	Method No.
VOC MS													
Surrogate Recovery Toluene D8	79										<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	110										<0	%	TM15/PM10
Dichlorodifluoromethane	<0.002										<0.002	mg/kg	TM15/PM10
Methyl Tertiary Butyl Ether #M	<0.006										<0.006	mg/kg	TM15/PM10
Chloromethane #	<0.003										<0.003	mg/kg	TM15/PM10
Vinyl Chloride	<0.002										<0.002	mg/kg	TM15_A/PM10
Bromomethane	<0.001										<0.001	mg/kg	TM15/PM10
Chloroethane #M	<0.006										<0.006	mg/kg	TM15/PM10
Trichlorofluoromethane #M	<0.003										<0.003	mg/kg	TM15/PM10
1,1-Dichloroethene (1,1 DCE) #M	<0.006										<0.006	mg/kg	TM15/PM10
Dichloromethane (DCM) #	<0.03										<0.03	mg/kg	TM15/PM10
trans-1-2-Dichloroethene #	<0.003										<0.003	mg/kg	TM15/PM10
1,1-Dichloroethane #M	<0.006										<0.006	mg/kg	TM15/PM10
cis-1-2-Dichloroethene #M	<0.007										<0.007	mg/kg	TM15/PM10
2,2-Dichloropropane	<0.004										<0.004	mg/kg	TM15/PM10
Bromochloromethane #M	<0.004										<0.004	mg/kg	TM15/PM10
Chloroform #M	<0.005										<0.005	mg/kg	TM15/PM10
1,1,1-Trichloroethane #M	<0.005										<0.005	mg/kg	TM15/PM10
1,1-Dichloropropene #	<0.003										<0.003	mg/kg	TM15/PM10
Carbon tetrachloride #M	<0.004										<0.004	mg/kg	TM15/PM10
1,2-Dichloroethane #M	<0.005										<0.005	mg/kg	TM15/PM10
Benzene #M	<0.005										<0.005	mg/kg	TM15/PM10
Trichloroethene (TCE) #M	<0.005										<0.005	mg/kg	TM15/PM10
1,2-Dichloropropane #M	<0.004										<0.004	mg/kg	TM15/PM10
Dibromomethane #M	<0.004										<0.004	mg/kg	TM15/PM10
Bromodichloromethane #M	<0.004										<0.004	mg/kg	TM15/PM10
cis-1-3-Dichloropropene	<0.004										<0.004	mg/kg	TM15/PM10
Toluene #M	<0.003										<0.003	mg/kg	TM15/PM10
trans-1-3-Dichloropropene	<0.003										<0.003	mg/kg	TM15/PM10
1,1,2-Trichloroethane #M	<0.004										<0.004	mg/kg	TM15/PM10
Tetrachloroethene (PCE) #	<0.003										<0.003	mg/kg	TM15/PM10
1,3-Dichloropropane #M	<0.004										<0.004	mg/kg	TM15/PM10
Dibromochloromethane #M	<0.005										<0.005	mg/kg	TM15/PM10
1,2-Dibromoethane #	<0.003										<0.003	mg/kg	TM15/PM10
Chlorobenzene #M	<0.004										<0.004	mg/kg	TM15/PM10
1,1,1,2-Tetrachloroethane #M	<0.005										<0.005	mg/kg	TM15/PM10
Ethylbenzene #M	<0.003										<0.003	mg/kg	TM15/PM10
p/m-Xylene #M	<0.004										<0.004	mg/kg	TM15/PM10
o-Xylene #M	<0.004										<0.004	mg/kg	TM15/PM10
Styrene	<0.003										<0.003	mg/kg	TM15_A/PM10
Bromoform	<0.004										<0.004	mg/kg	TM15/PM10
Isopropylbenzene #	<0.003										<0.003	mg/kg	TM15/PM10
1,1,2,2-Tetrachloroethane #M	<0.003										<0.003	mg/kg	TM15/PM10
Bromobenzene	<0.002										<0.002	mg/kg	TM15/PM10
1,2,3-Trichloropropane #M	<0.004										<0.004	mg/kg	TM15/PM10
Propylbenzene #	<0.004										<0.004	mg/kg	TM15/PM10
2-Chlorotoluene	<0.003										<0.003	mg/kg	TM15/PM10
1,3,5-Trimethylbenzene #	<0.003										<0.003	mg/kg	TM15/PM10
4-Chlorotoluene	<0.003										<0.003	mg/kg	TM15/PM10
tert-Butylbenzene #	<0.005										<0.005	mg/kg	TM15/PM10
1,2,4-Trimethylbenzene #	<0.006										<0.006	mg/kg	TM15/PM10
sec-Butylbenzene #	<0.004										<0.004	mg/kg	TM15/PM10
4-Isopropyltoluene #	<0.004										<0.004	mg/kg	TM15/PM10
1,3-Dichlorobenzene #M	<0.004										<0.004	mg/kg	TM15/PM10
1,4-Dichlorobenzene #	<0.004										<0.004	mg/kg	TM15/PM10
n-Butylbenzene #	<0.004										<0.004	mg/kg	TM15/PM10
1,2-Dichlorobenzene #M	<0.004										<0.004	mg/kg	TM15/PM10
1,2-Dibromo-3-chloropropane #	<0.004										<0.004	mg/kg	TM15/PM10
1,2,4-Trichlorobenzene #	<0.007										<0.007	mg/kg	TM15/PM10
Hexachlorobutadiene	<0.004										<0.004	mg/kg	TM15/PM10
Naphthalene	<0.027										<0.027	mg/kg	TM15/PM10
1,2,3-Trichlorobenzene #	<0.007										<0.007	mg/kg	TM15/PM10

Mass of sample taken (kg)	-	Moisture Content Ratio (%) =	19.1
Mass of dry sample (kg) =	0.09	Dry Matter Content Ratio (%) =	84.0
Particle Size <4mm =	>95%		

		Landfill Waste Acceptance Criteria Limits		
JEFL Job No	**17/17411**	**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Sample No	**35**			
Client Sample No	**WAC**			
Depth/Other				
Sample Date	**18/10/2017**			
Batch No	**1**			
Solid Waste Analysis				
Total Organic Carbon (%)	0.96	3	5	6
Loss on Ignition (%)	-	-	-	10
Sum of BTEX (mg/kg)	<0.025	6	-	-
Sum of 7 PCBs (mg/kg)	<0.035	1	-	-
Mineral Oil (mg/kg)	<30	500	-	-
PAH Sum of 17(mg/kg)	2.04	100	-	-
pH (pH Units)	-	-	>6	-
ANC to pH 7 (mol/kg)	-	-	to be evaluated	to be evaluated
ANC to pH 4 (mol/kg)	-	-	to be evaluated	to be evaluated

Eluate Analysis	**10:1 conc^{n} leached**		**Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg**		
	C_{10}	**A_{10}**			
	mg/l	**mg/kg**	**mg/kg**		
Arsenic	0.0041	0.041	0.5	2	25
Barium	0.005	0.05	20	100	300
Cadmium	<0.0005	<0.005	0.04	1	5
Chromium	<0.0015	<0.015	0.5	10	70
Copper	<0.007	<0.07	2	50	100
Mercury	<0.001	<0.01	0.01	0.2	2
Molybdenum	0.003	0.03	0.5	10	30
Nickel	<0.002	<0.02	0.4	10	40
Lead	<0.005	<0.05	0.5	10	50
Antimony	<0.002	<0.02	0.06	0.7	5
Selenium	<0.003	<0.03	0.1	0.5	7
Zinc	<0.003	<0.03	4	50	200
Chloride	2.2	22	800	15000	25000
Fluoride	<0.3	<3	10	150	500
Sulphate as SO4	47	470	1000	20000	50000
Total Dissolved Solids	150	1500	4000	60000	100000
Phenol	<0.01	<0.1	1	-	-
Dissolved Organic Carbon	5	50	500	800	1000

Client Name: SLR Consulting Ltd
Reference: 408.05640.00021
Location: Pudding Lane
Contact: Jeremy Head

Note:

Asbestos Screen analysis is carried out in accordance with our documented in-house methods PM042 and TM065 and HSG 248 by Stereo and Polarised Light Microscopy using Dispersion Staining Techniques and is covered by our UKAS accreditation. Detailed Gravimetric Quantification and PCOM Fibre Analysis is carried out in accordance with our documented in-house methods PM042 and TM131 and HSG 248 using Stereo and Polarised Light Microscopy and Phase Contrast Optical Microscopy (PCOM). Samples are retained for not less than 6 months from the date of analysis unless specifically requested.

Opinions, including ACM type and Asbestos level, lie outside the scope of our UKAS accreditation.

Where the sample is not taken by a Jones Environmental Laboratory consultant, Jones Environmental Laboratory cannot be responsible for inaccurate or unrepresentative sampling.

Signed on behalf of Jones Environmental Laboratory:

Ryan Butterworth
Asbestos Team Leader

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Date Of Analysis	Analysis	Result
17/17411	1	TP1	0.00-0.20	1	24/10/2017	**General Description (Bulk Analysis)**	soil/stones
					24/10/2017	**Asbestos Fibres**	NAD
					24/10/2017	**Asbestos Fibres (2)**	NAD
					24/10/2017	**Asbestos ACM**	NAD
					24/10/2017	**Asbestos ACM (2)**	NAD
					24/10/2017	**Asbestos Type**	NAD
					24/10/2017	**Asbestos Type (2)**	NAD
					24/10/2017	**Asbestos Level Screen**	NAD
17/17411	1	TP2	0.00-0.20	6	24/10/2017	**General Description (Bulk Analysis)**	soil/stones
					24/10/2017	**Asbestos Fibres**	NAD
					24/10/2017	**Asbestos Fibres (2)**	NAD
					24/10/2017	**Asbestos ACM**	NAD
					24/10/2017	**Asbestos ACM (2)**	NAD
					24/10/2017	**Asbestos Type**	NAD
					24/10/2017	**Asbestos Type (2)**	NAD
					24/10/2017	**Asbestos Level Screen**	NAD
17/17411	1	TP4	0.00-0.20	16	24/10/2017	**General Description (Bulk Analysis)**	soil/stones
					24/10/2017	**Asbestos Fibres**	Free Fibres
					24/10/2017	**Asbestos ACM**	Asbestos Cement
					24/10/2017	**Asbestos Type**	Chrysotile
					24/10/2017	**Asbestos Level Screen**	Asbestos level cannot be determined from Screen. Quantification required.
17/17411	1	TP6	0.00-0.20	28	24/10/2017	**General Description (Bulk Analysis)**	soil/stones
					24/10/2017	**Asbestos Fibres**	Free Fibres
					24/10/2017	**Asbestos ACM**	Asbestos Cement
					24/10/2017	**Asbestos Type**	Chrysotile
					24/10/2017	**Asbestos Level Screen**	Asbestos level cannot be determined from Screen. Quantification required.

Client Name: SLR Consulting Ltd
Reference: 408.05640.00021
Location: Pudding Lane
Contact: Jeremy Head

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Analysis	Reason
No deviating sample report results for job 17/17411						

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating.
Only analyses which are accredited are recorded as deviating if set criteria are not met.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

JE Job No.: 17/17411

SOILS

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overesitimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

DEVIATING SAMPLES

Samples must be received in a condition appropriate to the requested analyses. All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. If this is not the case you will be informed and any test results that may be compromised highlighted on your deviating samples report.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.
Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS) accredited - UK.
SA	ISO17025 (SANAS) accredited - South Africa.
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
++	Result outside calibration range, results should be considered as indicative only and are not accredited.
*	Analysis subcontracted to a Jones Environmental approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range

JE Job No: 17/17411

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465 and BS1377.	PM0	No preparation is required.				
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465 and BS1377.	PM0	No preparation is required.			AR	
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes	Yes	AR	Yes
TM5	Modified USEPA 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) with carbon banding within the range C8-C40 GC-FID.	PM16	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.			AR	Yes
TM5	Modified USEPA 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) with carbon banding within the range C8-C40 GC-FID.	PM16	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM5	Modified USEPA 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) with carbon banding within the range C8-C40 GC-FID.	PM16	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes	Yes	AR	Yes
TM5	Modified USEPA 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) with carbon banding within the range C8-C40 GC-FID.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes	Yes	AR	Yes
TM5/TM36	TM005: Modified USEPA 8015B. Determination of solvent Extractable Petroleum Hydrocarbons (EPH) including column fractionation in the carbon range of C10-35 into aliphatic and aromatic fractions by GC-FID. TM036: Modified USEPA 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C5-10 by headspace GC-FID. Including determination of BTEX and calculation of Aliphatic fractions	PM12/PM16	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis./Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.			AR	Yes

JE Job No: 17/17411

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM5/TM36	TM005: Modified USEPA 8015B: Determination of solvent Extractable Petroleum Hydrocarbons (EPH) including column fractionation in the carbon range of C10-35 into aliphatic and aromatic fractions by GC-FID. TM036: Modified USEPA 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C5-10 by headspace GC-FID. Including determination of BTEX and calculation of Aliphatic fractions	PM12/PM16	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis./Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
PM13	A visual examination of the solid sample is carried out to ascertain sample make up, colour and any other inclusions. This is not a geotechnical description.	PM0	No preparation is required.			AR	
TM15	Modified USEPA 8260. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM15	Modified USEPA 8260. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM15	Modified USEPA 8260. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes	Yes	AR	Yes
TM17	Modified US EPA method 8270. Determination of specific Polychlorinated Biphenyl congeners by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM20	Modified BS 1377-3: 1990/USEPA 160.3 Gravimetric determination of Total Dissolved Solids/Total Solids	PM0	No preparation is required.			AR	Yes
TM21	Modified USEPA 415.1. Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO2 generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.	Yes		AD	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM0	No preparation is required.			AR	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM21	As received solid or water samples are extracted in Methanol: Sodium Hydroxide (0.1M NaOH) (60:40) by orbital shaker.			AR	Yes

JE Job No: 17/17411

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.	Yes	Yes	AD	Yes
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM17	Modified method EN12457-2 As received solid samples are leached with water in a 10:1 water to soil ratio for 24 hours, the moisture content of the sample is included in the ratio.	Yes		AR	Yes
TM31	Modified USEPA 8015B. Determination of Methyltertbutylether, Benzene, Toluene, Ethylbenzene and Xylene by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM31	Modified USEPA 8015B. Determination of Methyltertbutylether, Benzene, Toluene, Ethylbenzene and Xylene by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes	Yes	AR	Yes
TM38	Soluble Ion analysis using the Thermo Aquakem Photometric Automatic Analyser. Modified US EPA methods 325.2, 375.4, 365.2, 353.1, 354.1	PM0	No preparation is required.	Yes		AR	Yes
TM38	Soluble Ion analysis using the Thermo Aquakem Photometric Automatic Analyser. Modified US EPA methods 325.2, 375.4, 365.2, 353.1, 354.1	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AR	Yes
TM50	Acid soluble sulphate (Total Sulphate) analysed by ICP-OES	PM29	Dried and ground solid sample is boiled with dilute hydrochloric acid, the resulting liquor is then analysed.	Yes	Yes	AD	Yes

JE Job No: 17/17411

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM60	Modified USEPA 9060. Determination of TOC by calculation from Total Carbon and Inorganic Carbon using a TOC analyser, the carbon in the sample is converted to CO2 and then passed through a non-dispersive infrared gas analyser (NDIR).	PM0	No preparation is required.			AR	Yes
TM65	Asbestos Bulk Identification method based on HSG 248.	PM42	Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	
TM73	Modified US EPA methods 150.1 and 9045D and BS1377:1990. Determination of pH by Metrohm automated probe analyser.	PM11	Extraction of as received solid samples using one part solid to 2.5 parts deionised water.	Yes	Yes	AR	No
TM89	Modified USEPA method OIA-1667. Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM45	As received solid samples are extracted with 1M NaOH by orbital shaker for Cyanide and Thiocyanate analysis.			AR	Yes
TM89	Modified USEPA method OIA-1667. Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM45	As received solid samples are extracted with 1M NaOH by orbital shaker for Cyanide and Thiocyanate analysis.	Yes	Yes	AR	Yes
TM106	Determination of Sulphide by Skalar Continuous Flow Analyser	PM119	As received solid samples are extracted with 1M NaOH by orbital shaker for Sulphide and Thiocyanate analysis.			AR	Yes
TM107	Determination of Thiocyanate by Skalar Continuous Flow Analyser	PM119	As received solid samples are extracted with 1M NaOH by orbital shaker for Sulphide and Thiocyanate analysis.			AR	Yes
TM173	Analysis of fluoride by ISE (Ion Selective Electrode) using modified ISE method 340.2	PM0	No preparation is required.			AR	Yes
NONE	No Method Code	PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465 and BS1377.			AR	
TM15_A	Modified USEPA 8260. Quantitative Determination of Volatile Organic Compounds, Vinyl Chloride & Styrene by Headspace GC-MS.	PM10	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes

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Attention :	Jeremy Head
Date :	7th November, 2017
Your reference :	408.05640.00021
Our reference :	Test Report 17/17411 Batch 1 Schedule B
Location :	Pudding Lane
Date samples received :	21st October, 2017
Status :	Final report
Issue :	1

Twenty samples were received for analysis on 21st October, 2017 of which two were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.
All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Compiled By:

Paul Boden BSc
Project Manager

Client Name: SLR Consulting Ltd
Reference: 408.05640.00021
Location: Pudding Lane
Contact: Jeremy Head

Note:

Asbestos Screen analysis is carried out in accordance with our documented in-house methods PM042 and TM065 and HSG 248 by Stereo and Polarised Light Microscopy using Dispersion Staining Techniques and is covered by our UKAS accreditation. Detailed Gravimetric Quantification and PCOM Fibre Analysis is carried out in accordance with our documented in-house methods PM042 and TM131 and HSG 248 using Stereo and Polarised Light Microscopy and Phase Contrast Optical Microscopy (PCOM). Samples are retained for not less than 6 months from the date of analysis unless specifically requested.

Opinions, including ACM type and Asbestos level, lie outside the scope of our UKAS accreditation.

Where the sample is not taken by a Jones Environmental Laboratory consultant, Jones Environmental Laboratory cannot be responsible for inaccurate or unrepresentative sampling.

Signed on behalf of Jones Environmental Laboratory:

Ryan Butterworth
Asbestos Team Leader

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Date Of Analysis	Analysis	Result
17/17411	1	TP4	0.00-0.20	16	07/11/2017	**Total ACM Gravimetric Quantification (% Asb)**	50.000 (mass %)
					07/11/2017	**Total Detailed Gravimetric Quantification (% Asb)**	<0.001 (mass %)
					07/11/2017	**Total Gravimetric Quantification (ACM + Detailed) (% Asb)**	50.000 (mass %)
17/17411	1	TP6	0.00-0.20	28	07/11/2017	**Total ACM Gravimetric Quantification (% Asb)**	50.000 (mass %)
					07/11/2017	**Total Detailed Gravimetric Quantification (% Asb)**	<0.001 (mass %)
					07/11/2017	**Total Gravimetric Quantification (ACM + Detailed) (% Asb)**	50.000 (mass %)

Client Name: SLR Consulting Ltd
Reference: 408.05640.00021
Location: Pudding Lane
Contact: Jeremy Head

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Analysis	Reason
No deviating sample report results for job 17/17411						

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating.
Only analyses which are accredited are recorded as deviating if set criteria are not met.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

JE Job No.: 17/17411

SOILS

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overesitimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

DEVIATING SAMPLES

Samples must be received in a condition appropriate to the requested analyses. All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. If this is not the case you will be informed and any test results that may be compromised highlighted on your deviating samples report.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.
Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa.
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
++	Result outside calibration range, results should be considered as indicative only and are not accredited.
*	Analysis subcontracted to a Jones Environmental approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range

JE Job No: 17/17411

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM131	Quantification of Asbestos Fibres and ACM, based on HSG248 and SCA method.	PM42	Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	Yes

APPENDIX 07

Risk Assessment Methodology

Introduction

Risk assessment is the process of collating known information on a hazard or set of hazards in order to estimate actual or potential risks to receptors. The receptor may be human health, a water resource, a sensitive local ecosystem or even future construction materials. Receptors can be connected with the hazard under consideration via one or several exposure pathways (e.g. the pathway of direct contact). Risks are generally managed by isolating or removing the hazard, isolating the receptor, or by intercepting the exposure pathway. Without the three essential components of a source (hazard), pathway and receptor, there can be no risk. Thus, the mere presence of a hazard at a site does not mean that there will necessarily be attendant risks. The following risk assessment thus focuses on those parts of the site where hazards or potential hazards have been identified and is not general to the whole site.

Hazards

Potential sources of contamination are identified for the site, based on a review of the current and previous site uses. Not only the nature but also the likely extent of any contamination is considered, e.g. whether such contamination is likely to be localised or widespread.

Receptors

The varying effects of a hazard on individual receptors depends largely on the sensitivity of the target. Receptors include any people, animal or plant population, or natural or economic resources within the range of the source which are connected to the source by the transport pathway. Receptors can, in addition, extend to remediation processes and future construction materials that may be adversely affected by on-site contamination. In general, however, receptors can be divided into a number of groups depending on the final use of the site.

Pathways

The mere presence of contamination does not infer a risk. The exposure pathway determines the dose delivered to the receptor and the effective dose determines the extent of the adverse effect on the receptor. The pathway which transports the contaminants to the receptor or target generally involves conveyance via soil, water or air.

Exposure Assessment

By considering the source, pathway and receptor, an assessment is made for each contaminant on a receptor by receptor basis with reference to the significance and degree of the risk. In assessing this information, a measure is made of whether the source contamination can reach a receptor, determining whether it is of a major or minor significance. The exposure risks are assessed against the present site conditions.

A risk assessment has been undertaken for these potential source-pathway-receptor linkages to identify potentially unacceptable risks on a qualitative basis. This approach is based on DEFRA and CIRIA guidance on risk assessment and Model Procedures. Risk is based on a consideration of both:

- the likelihood of an event (probability); [takes into account both the presence of the hazard and receptor and the integrity of the pathway]; and
- the severity of the potential consequence [takes into account both the potential severity of the hazard and the sensitivity of the receptor].

In order to then determine the risk to the identified receptor, both the likelihood and severity of the potential hazard is input into a risk assessment matrix as follows:

		Consequence			
		Severe	Medium	Mild	Minor/Negligible
Probability (Likelihood)	High Likelihood	Very high risk	High risk	Moderate risk	Moderate/Low risk
	Likely	High risk	Moderate risk	Moderate/Low risk	Low risk
	Low Likelihood	Moderate risk	Moderate/Low risk	Low risk	Negligible risk
	Unlikely	Moderate/Low risk	Low risk	Negligible risk	Negligible risk

Under such a classification system the following categorisation of risk has been developed and the terminology adopted as follows:

Term	Description
Very high risk	Severe harm to a receptor may already be occurring OR a high likelihood that severe harm will arise to a receptor, unless immediate remedial action works / mitigation measures are undertaken.
High risk	Harm is likely to arise to a receptor, and is likely to be severe, unless appropriate remedial actions / mitigation measures are undertaken. Remedial works may be required in the short term, but likely to be required over the long term.
Moderate risk	Possible that harm could arise to a receptor but low likelihood that such a harm would be severe. Harm is likely to be medium. Some remedial works may be required in the long term.
Moderate / low risk	Possible that harm could arise to a receptor, but where a combination of likelihood and consequence results in a risk that is above low, but is not of sufficient concern to be classified as medium. It can be driven by cases where there is an acute risk which carries a severe consequence, but where the exposure is unlikely.
Low risk	Possible that harm could arise to a receptor. Such harm would at worse normally be mild.
Negligible risk	Low likelihood that harm could arise to a receptor. Such harm unlikely to be any worse than mild.

The colour coding for each risk category is used in the risk assessment summary table.

Classification of Consequences

Classification	Definition
Severe	▪ Acute risks to human health ▪ Short-term risk of pollution of sensitive water resource (e.g. major spillage into controlled waters) ▪ Impact on controlled waters e.g. large scale pollution or very high levels of contamination ▪ Catastrophic damage to buildings or property 9e.g. explosion causing building collapse) ▪ Ecological system effects – irreversible adverse changes to a protected location. Immediate risks.
Medium	▪ Chronic risks to human health ▪ Pollution of sensitive water resources (e.g. leaching of contaminants into controlled waters) ▪ Ecological system effects – substantial adverse changes to a protected location. ▪ Significant damage to buildings, structures and services (e.g. damage rendering a building unsafe to occupy, such as foundation damage)
Mild	▪ Non-permanent health effects to human health ▪ Pollution of non-sensitive water resources (e.g. pollution of non-classified groundwater) ▪ Damage to buildings, structures and services (e.g. damage rendering a building unsafe to occupy, such as foundation damage) ▪ Substantial damage to non-sensitive environments (unprotected ecosystems e.g. crops)
Minor/Negligible	▪ Non-permanent health effects to human health (easily prevented by appropriate use of PPE ▪ Minor pollution to non-sensitive water resources ▪ Minor damage to non-sensitive environments (unprotected ecosystems e.g. crops) ▪ Easily repairable effects of damage to buildings, structures, services or the environment (e.g. discoloration of concrete, loss of plants in a landscaping scene).

Classification	Definition
High Likelihood	An event is very likely to occur in the short term, and is almost inevitable over the long term OR there is evidence at the receptor of harm or pollution
Likely	It is probably that an event will occur. It is not inevitable, but possible in the short term and likely over the long term
Low Likelihood	Circumstances are possible under which an event could occur. It is by no means certain that even over a longer period such an event would take place, and less likely in the short term
Unlikely	It is improbable that an event would occur even in the very long term

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