

**LAND BETWEEN CROMFORD AVENUE AND BLACKEATH ROAD,
(ALSO KNOWN AS LAND AT HADDON ROAD)
ATHERSLEY SOUTH,
BARNSELY, S71 3SY**



REPORT ON PHASE 2 GEO-ENVIRONMENTAL INVESTIGATION

Prepared by

SILKSTONE ENVIRONMENTAL LTD

For

ALPHA DORA PROPERTY GROUP

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EXECUTIVE SUMMARY

Site Location	The site is located between Cromford Avenue and Blackheath Road, South Athersley, approximately 2km northeast of Barnsley town centre at NGR 435680 409016.
Site Features	The site is an area of vacant land comprising mostly concrete hardstanding with some smaller areas of asphalt surfacing, some sporadic low-level vegetation mostly extending along joints within the hardstanding and sporadic occurrences of litter.
Proposed Development	Assisted living accommodation comprising of fourteen apartments arranged in two detached two storey blocks with bin store, car park, shared private amenity space and soft landscaping.
Purpose of Investigation	To inform and support the design process for the proposed development by investigating ground conditions to ascertain geotechnical parameters to inform foundation design, assess soil permeability for soakaway drainage and to assess contamination risk.
Scope of Works	The investigation involved 8 no. windowless sampling boreholes, in-situ geotechnical testing, chemical and geotechnical laboratory testing on soils, permeability testing to assess suitability for soakaway drainage of surface water and technical reporting.
Encountered Strata	Made Ground (ground made, affected or disturbed by human activity) was proven to its full depth at all locations ranging between 0.40 and 0.80m begl. The Made Ground comprised predominantly granular material with a concrete and / or asphalt capping above a sandy gravel (or gravelly sand) of mostly sandstone, pebbles, brick and concrete with occasional coal and clinker and small fragments of ceramic tile, glass and timber. The small proportion of cohesive Made Ground was generally encountered at or close to the bottom section as a slightly gravelly sandy silt and a slightly gravelly sandy clay.
	The natural soils below the Made Ground were encountered to depths of between 0.90 and 1.80m begl and comprised predominantly granular material of slightly clayey sandy gravel of sandstone with sandstone cobbles or as a slightly clayey gravelly sand with gravel of sandstone, both constituting either residual weathered sandstone or highly weathered sandstone.
	The depth to bedrock ranged between 0.90 and 1.80m begl across the site and was encountered as an orangey brown highly weathered sandstone.
Groundwater	Whilst some moist strata was recorded at one location (WS06 at 1.35-1.70m begl), no groundwater ingress was encountered during the investigation.
Geotechnical	It is considered that the use of traditional strip footings founded on bedrock from depths at 1.00-1.80m begl will be feasible where adequate bearing and low risk of excessive and/or differential settlement is likely to be experienced with an approximate allowable bearing capacity in excess of 200kN/m ² .
	Excavations for foundations should be inspected and any soft spots removed and replaced with a suitably approved grade of engineering fill to further alleviate the risk of differential settlement.
	No groundwater was encountered during the investigation and therefore the provision of a shoring and sump arrangement is unlikely to be required for any deep excavation. However, it should be noted that groundwater levels can vary on a seasonal basis and therefore may be higher during winter months.
Contamination	The soil contamination screening assessment for human health has identified elevated concentrations above soil screening values (SSVs) in three polyaromatic hydrocarbon (PAH) compounds in one sample from the Made Ground at 0.20-0.40m in WS01. However, the margins of exceedance were only slight and the elevations are believed to originate from fall back of small fragments of asphalt into the sample from the surface and therefore represent a false result.
	Testing for pathogens has identified high levels in clostridium perfringens (a secondary indicator for faecal contamination) in two out of six samples and a less significant level in another sample, all at depths of less than 0.60m. The potential source of the faecal contamination is unknown. No drains were penetrated during the investigation and testing for faecal enterococci determined levels below detection limits indicating no recent faecal contamination of the soil.
Risk Overview	The proposed development is considered to present an overall Very Low to Moderate geo-environmental risk. The main risks relate to construction workers and site end users (residents and visitors) from sporadic historical faecal contamination identified at three locations.

Recommendations	<ol style="list-style-type: none">1. Careful removal the old asphalt surfacing within the area proposed for shared private amenity space to avoid introducing asphalt fragments into the subsurface where they may form part of any imported soil layers. The asphalt surfacing, once removed, should be stockpiled separately from the other Made Ground materials destined for offsite disposal.2. The preparation of a Remediation Strategy to overcome the faecal contamination risk within the proposed shared private amenity space to be submitted to the Local Authority for approval.
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This Executive Summary should be read in conjunction with the entire report as it is only a brief account highlighting the key findings.

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REFERENCES

- A *Land Contamination Risk Management*, Environment Agency, July 2023.
- B *Guiding Principles for Land Contamination*, Environment Agency, March 2010.
- C BS 5930:2020 *Code of Practice for Site Investigations*.
- D BS 10175: 2017 *Investigation of potentially contaminated sites: Code of practice*.
- E CIRIA C665:2007 *Assessing the risk posed by hazardous ground gases to buildings*
- F Town and Country Planning Act 1990.
- G National Planning Policy Framework, December 2024.
- H Revised Statutory Guidance dated April 2012 implementing the contaminated land provisions under Part 2A of the Environmental Protection Act 1990.
- I CIRIA RR97 *Trenching practice*, 2nd edition, 2001.
- J *Health and Safety in Construction*, HSG150, HSE, 2006
- K NHBC Standards, Chapter 4, 2020.
- L BRE Special Digest 1 (SD1) (2005) *Concrete in Aggressive Ground Part 1: Assessing the aggressive chemical environment*, 3rd edition.
- M *Suitable 4 Use Levels (S4ULs) for human health risk assessment*, Land Quality Management Limited and the Chartered Institute of Environmental Health (CIEH), January 2015.
- N *SP1010 - Development of category 4 screening levels for assessment of land affected by contamination. Final project report (Revision 2)*, CL:AIRE for Department for Environment, Food and Rural Affairs (DEFRA), 24th September 2014.
- O Individual publications on *Category 4 screening levels* for vinyl chloride, tetrachloroethene (PCE) and trichloroethene (TCE), CL:AIRE 2021.
- P *Soil Generic Assessment Criteria for Human Health Risk Assessment*, Contaminated Land: Applications in Real Environments (CL:AIRE), January 2010.
- Q Technical Guidance WM3, *Guidance on the classification and assessment of waste*, UK environmental agencies, 1st edition v1.2.GB, October 2021.

1.0 INTRODUCTION

1.1 Brief

Silkstone Environmental Ltd (SEL) have completed a Phase 2 (intrusive) geo-environmental investigation for a plot of land between the Cromford Avenue and Blackheath Road, Barnsley, S71 3SY (the site) (also known as land at Haddon Road) following receipt of an email instruction to proceed from Mr T Marsh, on behalf of Alpha Dore Property Group, dated 28th March 2025.

The site is a generally level area of vacant land comprising mostly concrete hardstanding with some smaller areas of asphalt surfacing and sporadic low level recolonising vegetation.

This report has been requested for the proposed development of two detached two-storey blocks of assisted living residential apartments, with one block containing eight apartments and the other six apartments. The development also includes a car park for fourteen spaces with access onto Blackheath Road, shared private amenity space and soft landscaping.

The purpose of the investigation was to characterise ground conditions, determine geotechnical parameters to inform the design of structural foundations, undertake soil contamination testing and assess soil permeability for soakaway drainage. The work included investigation fieldwork, in-situ geotechnical testing, permeability testing, chemical and geotechnical laboratory testing and the preparation of this report.

The intrusive investigation follows the completion of a *Phase 1 Preliminary Geo-Environmental Risk Assessment* (or desk study) for the site prepared by SEL, reference 24246/P1/0 and issued on 7th November 2024, which should be read alongside this latest report.

1.2 Guidance and Information Sources

This report has been produced in line with relevant guidance and best practice. The ground investigation has been carried out in general accordance with the requirements of *Land Contamination Risk Management* (Ref. A), involving a tier 2 generic quantitative risk assessment. The investigation has also been carried out in general accordance with the '*Guiding Principles for Land Contamination*' (Ref. B), the recommendations of BS5930:(2020) *Code of Practice for Site Investigations* (Ref. C), BS10175:(2017) *Investigation of Potentially Contaminated Sites: Code of Practice* (Ref. D) and CIRIA C665:2007 *Assessing the risk posed by hazardous ground gases to buildings* (Ref. E).

If land proposed to be developed is suspected to be contaminated either historically or by its current use, an investigation may be requested by the Local Authority under the Town and Country Planning Act 1990 (Ref. F) and the National Planning Policy Framework (2024) (Ref. G) to determine the level of risk and if remediation is necessary or whether there may be grounds for the land to be considered contaminated under Part 2A of the Environmental Protection act 1990 (Ref. H). Under this regime investigations are carried out to determine if the current condition of the land is suitable for its proposed use.

1.3 Report Limitations

The comments and opinions expressed in this report are based on the ground conditions encountered at the specific locations during the fieldwork and on the results of measurements made in the field and in the laboratory. However, conditions may prevail which were not revealed by the investigation and which, therefore, could not be taken into account. In particular it should be noted that groundwater levels may vary due to seasonal or other effects such as boring, drilling and excavation processes.

The conclusions reached in this report are necessarily restricted to those which can be determined from available information and may be subject to amendment in the light of additional information becoming available or to changes in relevant legislation.

This report is strictly confidential to the party to whom it is addressed and may only be relied upon by that party or their other professional advisors, for the specific purpose to which it refers. Any third party using this report does so entirely at their own risk and SEL accepts no responsibility or liability for any costs, claims, damages or expenses (including consequential damages) as a result of this report or any part of its contents being used by any third party.

Except in connection with the specific purpose for which this report has been prepared, neither the whole nor any part of this report, nor any reference thereto, may be included in any published document, circular or statement, nor published in any way, nor disclosed orally to a third party, without the written approval from SEL of the form and context of such publication or disclosure. Such approval is required whether or not SEL are referred to by name and whether or not the report is combined with others.

SEL are unaware of any conflicts of interest in the preparation of this report.

2.0 ENVIRONMENTAL SETTING

2.1 Site Location

The site is located between Cromford Avenue and Blackheath Road (and to the north of Haddon Road), Athersley South, approximately 2km to the northeast of Barnsley town centre. A site location plan is presented as Figure 1 in Appendix A.

The National Grid Reference (NGR) for the centre of the site is 435680, 409016. The site is approximately 0.18ha in area and situated at an approximate height of 86-85m Above Ordnance Datum (AOD), with the ground across the site dipping very slightly to the north.

2.2 Historical Land Use

The Phase 1 desk study report found that the site was part of a large field until before 1958 when two buildings were developed within the southwestern part of the site. These were identified to form part of a milk depot by 1970 when a large open fronted canopy structure had been added. The milk depot buildings on site were cleared sometime between 2001 and 2010.

The surrounding area was originally fields with a small reservoir located to the northwest. The first major changes had taken place by 1948 when residential development had been initiated, which slowly expanded in subsequent years.

2.3 Current Site Condition

At the time of the ground investigation the site appeared unchanged since SEL undertook the site walkover for the Phase 1 desk study in October 2024.

The site is an area of vacant land and at the time of the recent investigation (see photos 1-6 in Appendix C) was observed to comprise mostly concrete hardstanding with some smaller areas of asphalt surfacing and sporadic low level vegetation mostly extending along joints in the hardstanding. Low levels of litter and a small number of discarded items / materials were also noted.

The site is located within an extensive residential area with an area of maintained public open space (lawn) adjoining the site to the north and small supermarket / post office adjoining the site to the south fronting onto Haddon Road. An ex-servicemen's club and institute also fronts onto Haddon Road from the south.

2.4 Geology

The anticipated geology of the location based on the previous Phase 1 report, with strata arranged in order of successive depth, is summarised in Table 1.

Table 1: Anticipated Geology

Artificial Ground	No Artificial or Made Ground recorded onsite, but some anticipated associated with historical use.
Superficial Deposits	No superficial deposits recorded onsite. Glacial Till deposits recorded 194m north of the site.
Solid Geology (Bedrock)	Pennine Middle Coal Measures Formation comprising the Woolley Edge Rock (coarse grained sandstone), above a grey mudstone, siltstone, other sandstones and occasional coal seams. Also contains beds of mudstone with marine fossils at the base. The onsite geology has a moderate to high fracture type permeability.
Dip of Solid Strata	2.9° to the northeast.
Faults	A normal fault exists 193m to the southeast, trending southwest to northeast.
Coal Seams / Mining	Site within a Coal Mining Reporting Area. No natural or mining cavities recorded within 500m. There is one record of non-coal mining activities within 250m of site, this being for iron ore located 243m southeast.

2.5 Hydrogeology

The Phase 1 desk study determined that the underlying bedrock is designated a Secondary (A) aquifer in which groundwater has a low vulnerability to any pollution discharged at the surface with a flow mechanism of well-connected fractures. Bedrock groundwater below the area to the immediate south of the site was described as having a high vulnerability, also with a flow mechanism of well-connected fractures. However, the soils overlying both areas were identified as having a low leaching class which should afford some degree of protection to the aquifer, making it less susceptible to pollution from the surface. There were also no recorded groundwater abstractions within 2km which also reduces groundwater sensitivity.

2.6 Hydrology

The Phase 1 report identified the nearest surface watercourse to the site to be a tributary of Cudworth Dike located 326m to the southeast. At this distance, together with the absence of any licensed surface water abstractions within 2km the site, the potential risk of any contamination that may arise and present a risk to surface waters as a result of the proposed development was considered to be low.

2.7 Ecology

The Phase 1 report identified the only potential ecological receptor to be Dearne Valley Park Local Nature Reserve located 1666m to the south, which was considered unlikely to be affected by the proposed development at this distance.

2.8 Ground Gas

Whilst the Phase 1 report identified several potentially gas¹ generating sources within 250m of the site, these were considered to be of insufficient credibility to represent a significant potential risk to the proposed development to warrant further investigation.

The site is located in a Radon Affected Area in which basic radon protection measures (a gas tight membrane) are required for new buildings.

¹ Reference to ground or land gas in this report refers principally to methane and carbon dioxide.

3.0 GROUND INVESTIGATION

3.1 Objectives

The objectives of the Investigation were as follows:

- To characterise ground conditions and provide geotechnical information to assist in the design of foundations with basic recommendations.
- To obtain soil samples for laboratory geotechnical and contamination testing;
- To confirm the outputs from the Phase 1 report, refine the conceptual site model and update the environmental risk assessment, as appropriate; and
- To make recommendations for any remedial measures or further work if appropriate.

3.2 Scope of Works

The investigation was completed on 15 and 16th April 2025 and involved the following:

- 7 no. window (also known as dynamic or windowless) sampling boreholes (WS01-07) to depths of between 1.28 and 2.19m below existing ground level (begl) with standard penetration testing (SPTs) at appropriate intervals from depths at 0.5-1.00m begl;
- Soil sampling within appropriate depth horizons for laboratory geotechnical testing to inform foundation design and chemical testing to enable assessment of the potential soil contamination risk; and
- Permeability testing as falling head tests at two borehole locations to determine the infiltration rate and assess the suitability for the use of soakaway drainage of roof water.

The investigation locations are identified on the exploration hole location plans provided as Figures 2 and 3 in Appendix A. WS02 was aborted after slow progress attempting to penetrate reinforced concrete which was in excess of 0.250m thick, but was reattempted successfully at WS02A.

The rationale for the scope of the investigation is provided in Table 2.

3.3 Ground Investigation Methodology

The investigation was supervised on site by a suitably qualified and experienced SEL Engineer with all exploratory holes logged and sampled in accordance with BS5930:2020 (Ref. C). The exploratory hole logs are provided in Appendix B and a photographic record is provided in Appendix C.

Prior to commencement, the location of underground utilities on site was reviewed by reference to utility information acquired from Utility Site Search Ltd.

Each exploratory hole location was also cleared using a Cable Avoidance Tool (CAT) prior to breaking ground. All windowless sampling locations were also initiated with a hand dug inspection pit as a further precaution prior to the use of mechanical plant.

Table 2: Ground Investigation Rationale

Hole ID	Position	Targeted Location	Rationale for Hole Position				
			Objectives	Elements Completed			
				Environ. Sampling	Geotech. Sampling	Insitu Geotech. Testing	Soakaway Testing
WS01	South side of proposed block B and for potential soakaway in car park.	N	Permeability testing and geotechnical testing for south side of proposed block B.	Y	Y	Y	Y
WS02	Potential soakaway in proposed car park.	Y	Targeting of former milk depot buildings for pathogens. WS03 was moved for ease of breaking out of surfacing.	Y	Y	Y	Y
WS03	Proposed cycle and bin store.	Y		Y		Y	
WS04	NE corner of block A.	Y	Targeting of proposed building corners for geotechnical purposes with non-targeted sampling within proposed private amenity space for contamination assessment.	Y	Y	Y	
WS05	NW corner of block A.			Y	Y	Y	
WS06	SW corner of block B (had to be moved for ease of breaking out).			Y		Y	
WS07	NE corner of block B.			Y		Y	

WS = Window sampling location

Excavation of the inspection pits was completed manually using a hand held breaker to penetrate hard surfacing followed by the use of a post hole digger and spade with the excavated soils being placed on clean plastic sheeting for recording and sampling.

Windowless sampling proceeded using an Archway Competitor tracked rig in which the soils are recovered from the ground in 1.00m long sample tubes fitted with a plastic sample liner to prevent cross contamination between samples.

Standard Penetration Tests (SPTs) were carried out during window sampling at depth intervals of between 0.70 and 1.20m intervals (depending on depth to bedrock) to provide information on soil strength.

Small, disturbed samples for both contamination and geotechnical testing were collected from the recovered soils at each location and placed in appropriate sealed containers provided by the testing laboratories. Larger bulk samples were also collected in polythene bags for geotechnical testing.

Soil samples to be analysed for organic compounds (such as petroleum hydrocarbons) were placed in amber glass jars and stored in a cool box with ice packs prior to dispatch to the chemical laboratory. All samples were collected using appropriate sampling equipment that was cleaned between each sampling location.

The permeability testing was conducted as falling head tests by SEL personnel at WS01 and WS02A. During each test, the diameter and depth of the hole were measured, following which water was poured into the hole to a specified depth and then the water level measured by dip meter at time intervals, with the interval of time depending on the rate the water level was observed to be falling.

Upon completion of the fieldwork the window sampling locations were backfilled with soil arisings in approximately the same order that they were excavated and surface hardstanding reinstated with either concrete or cold mix asphalt.

3.4 Laboratory Testing

Samples for potential contamination were submitted to the UKAS and MCERTS accredited chemical laboratory of SOCOTEC. Samples for geotechnical testing were submitted to the UKAS accredited Professional Soils Laboratory (PSL). All tests were scheduled by SEL in accordance with the encountered ground conditions.

Geotechnical Testing

The following geotechnical tests were scheduled:

Table 3: Scope of Geotechnical Testing

Test	Number
Moisture content	1
Particle size distribution (sieve & sedimentation)	3
BRE concrete design suite (soil aggressiveness)	4

The geotechnical laboratory results are provided in Appendix D and discussed in Section 5.

Contamination Analysis

Samples designated for contamination testing were analysed for the following:

Table 4: Chemical Analysis Suite

Analytical Parameters	No. of Samples
pH (acidity/alkalinity)	14
Metals / metalloids (arsenic, cadmium, chromium, hexavalent chromium, copper, lead, mercury, nickel, selenium, zinc)	10
Sulphate (2:1 water soluble) as SO ₄	4
Total and speciated polycyclic aromatic hydrocarbons (PAHs)	10
Total petroleum hydrocarbons (TPHs) CWG aliphatic / aromatic split	6
Benzene, toluene, ethylbenzene, xylenes (BTEX) & MTBE	6
Soil organic matter (SOM)	10
Asbestos screen & ID (stage 1)	9
Pathogens suite (faecal enterococci, e. coli, coliforms, staphylococcus aureus, clostridium perfringens, salmonella, listeria)	6

Testing for Waste Acceptance Criteria (WAC) was also conducted on one composite sample from two incremental samples from the Made Ground.

The certified chemical laboratory results are presented in Appendix F of this report and discussed in section 6.

4.0 ENCOUNTERED GROUND CONDITIONS

4.1 General

The ground conditions encountered are described in detail on each of the exploratory hole logs and summarised below. The logs for each location are presented in Appendix B and a photographic record of the soils encountered is provided in Appendix C.

4.2 Made Ground

Made Ground was encountered and proven to its full depth at all seven windowless sampling locations and extended to depths of between 0.40m begl (WS01) and 0.80m begl (WS05). The Made Ground comprised 77% granular material and 23% cohesive material.

The Made Ground comprised concrete (often found reinforced) or asphalt (sometimes above concrete) above a granular material (with the upper part also described as a sub base) and comprising a sandy gravel (or gravelly sand) of mostly sandstone, pebbles, brick and concrete with occasional coal and clinker and small fragments of ceramic tile, glass and timber.

The cohesive material was encountered within or close to the bottom section of the Made Ground at the majority of locations as a slightly gravelly sandy silt at WS01 (described as a topsoil) and WS05 and as a slightly gravelly sandy clay at WS02A, WS03 and WS04.

The Made Ground was deepest in the northwestern corner of the site (0.80m begl at WS05) and shallowest near the southeastern corner (0.40m begl at WS01).

4.3 Natural Ground

The natural soils below the Made Ground were encountered at all seven locations to depths of between 0.90 and 1.80m begl and comprised 95% granular soils and 5% cohesive soils.

The granular material was encountered mostly as a slightly clayey sandy gravel of sandstone with sandstone cobbles or as a slightly clayey gravelly sand with gravel of sandstone, both constituting either residual weathered sandstone or highly weathered sandstone.

The small proportion of cohesive material was recorded at only two locations as a slightly gravelly sandy clay at WS02A and WS05, with the gravel component comprising sandstone and both representing the residual weathered sandstone.

The depth to bedrock ranged between 0.90 and 1.80m begl across the site and was encountered as an orangey brown highly weathered sandstone.

4.4 Groundwater

Whilst some moist strata was recorded at one location (WS06 at 1.35-1.70m begl), no groundwater ingress was recorded during the investigation.

A localised pocket of wet strata was also observed in the soil recovered from 1.80-1.99m begl at WS02A, but this is believed to have been residual water remaining from the permeability testing conducted at this location prior to the continuation of windowless sampling.

4.5 Permeability Testing

Permeability testing was completed as falling head tests at WS01 and WS02A to assess soil permeability for the potential use of soakaway drainage. The testing reports are provided in Appendix E and the results have been summarised in the following table (Table 5).

Table 5: Results of Permeability Testing

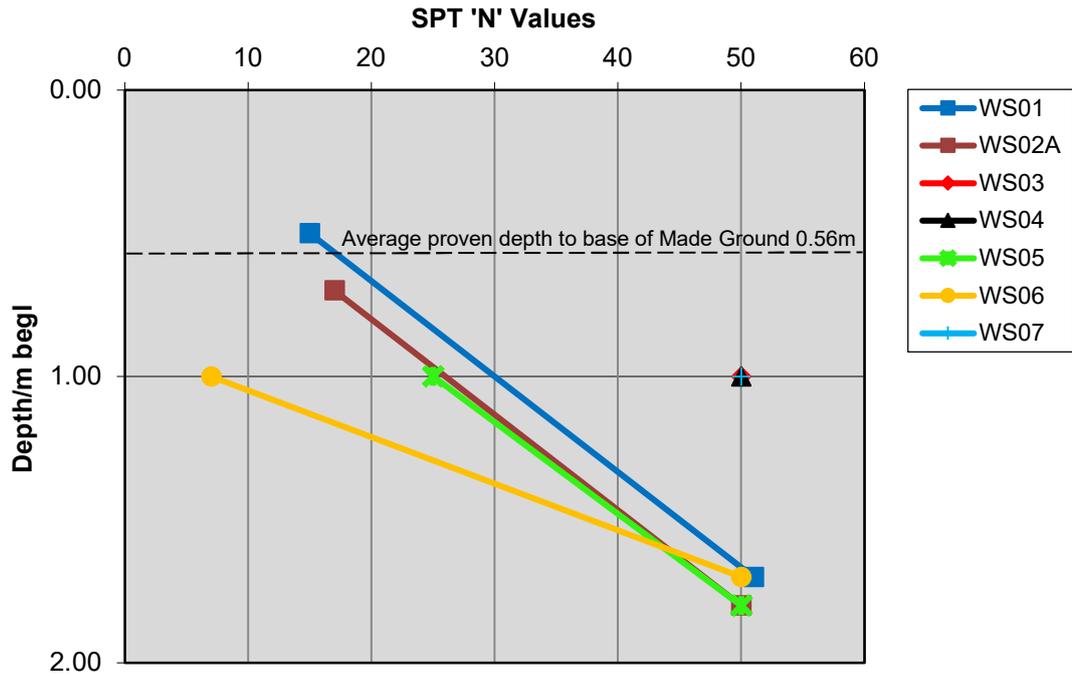
Hole ID	Response Zone (m)	Test	Infiltration Rate (m/s)	Level of Permeability	Drainage Conditions	Comments
WS01	1.00-1.70	1	-	Practically impermeable		Infiltration rate could not be calculated due to very slow reduction in water level.
WS02A	1.00-1.80	1	-			

The testing at the two differing locations within the site during the investigation has shown very slow infiltration rates which means that the soils are unsuitable for soakaway drainage based on the tests conducted.

4.6 In-situ Testing for Soil Strength

Standard Penetration Testing

Standard Penetration Tests (SPTs) were carried out at intervals appropriate to the depth of the holes or the depth to bedrock and commenced within the natural strata at depths of 0.50-1.00m begl. The SPT 'N' values are recorded on the exploratory hole logs provided in Appendix B and are shown graphically on the following page.



The N values recorded within the natural soils ranged between 7 and 25 indicating a loose to medium dense granular material or soft to stiff cohesive material at depths ranging between 0.50 and 1.00m begl. The N values recorded within the sandstone bedrock at depths of 1.00-1.80m begl exceeded the maximum of 50 and are consistent with the field descriptions of weathered sandstone.

Hand Vane Testing

No hand vane testing was undertaken on any of the recovered sections of the natural soils because the soils were not considered appropriate for this type of testing due to the varying proportions of granular material.

5.0 GEOTECHNICAL ASSESSMENT

5.1 Proposed Works

The proposed development is for the construction of two detached two-storey blocks of assisted living residential apartments. The development also includes a car park for fourteen spaces with access onto Blackheath Road, shared private amenity space and soft landscaping.

5.2 Ground Conditions

The site is underlain by Made Ground to depths ranging between 0.40 and 0.80m begl and comprises a concrete and / or asphalt capping above predominantly granular material. This is underlain by natural predominantly granular soils (see Section 4.3 for detailed descriptions), with the SPT results indicating engineering bedrock to be at depths ranging between 1.00 and 1.80m begl.

5.3 Site Preparation

Based on observations of the excavated materials, heavy plant and / or hydraulic breaking equipment is likely to be required to penetrate the asphalt and reinforced concrete hardstanding extending across the majority of the site and the predominantly granular Made Ground and natural soils beneath.

Excavations where access is required should be supported in accordance with CIRIA RR97 (Ref. I).

Excavations should be regularly inspected by a competent person to ensure continued safety. Further advice on the safety of excavations is given in *Health and Safety in Construction* (Ref. J).

No groundwater was encountered during the investigation and therefore the provision of a shoring and sump arrangement is unlikely to be required for any deep excavation. However, it should be noted that groundwater levels can vary on a seasonal basis and therefore may be higher during winter months.

5.4 Geotechnical Laboratory Results

Particle Size Distribution

Three samples of natural material were recovered from variable depths ranging between 0.63m to a maximum of 2.19m begl at WS01, WS04 and WS05l and tested for particle size distribution (sieve and sedimentation). The results are included in Appendix D and calculation of the uniformity coefficient and coefficient of curvature values for each of the grading curves indicate the material in each sample to be poorly graded.

Protection of Buried Concrete

The Design Sulphate Class for the use of concrete in structures has been derived in accordance with BRE Special Digest 1 (Ref. L) as DS-1 and the Aggressive Chemical Environment for Concrete (ACEC) class is AC-1. This is based on the following:

- The characteristic value for sulphate in soil (2:1 leachate equivalent) being 56mg/l;
- The characteristic value for soil pH is pH7.6;
- The characteristic value for total potential sulphate is 0.027%;
- Anticipated mobile groundwater; and
- Having no need to take into account magnesium concentrations because sulphate concentrations in soil are less than 3000mg/l.

5.5 Foundations

Made Ground has been encountered across the site to depths of between 0.40 and 0.80m begl. Foundations should not be constructed upon or within this Made Ground as it is variable in nature and could result in excessive differential settlement.

The natural soils underlying the Made Ground are predominantly granular in nature but have a variable strength with SPT results for depths between 0.50 and 1.00m begl indicating a loose to medium dense material.

On this basis, it is considered that the use of traditional strip footings founded on bedrock from depths at 1.00-1.80m begl will be feasible where adequate bearing and low risk of excessive and/or differential settlement is likely to be experienced with an approximate allowable bearing capacity in excess of 200kN/m².

Excavations for foundations should be inspected and any soft spots removed and replaced with a suitably approved grade of engineering fill to further alleviate the risk of differential settlement.

5.6 Material Reuse

It is considered that any natural soils that may be excavated for foundations during the development, may be considered suitable for reuse on site as general fill due its predominantly granular nature.

6.0 CONTAMINATION ASSESSMENT

6.1 Visual and Olfactory Evidence for Contamination

No obvious visual and/or olfactory signs of potential significant contamination (such as hydrocarbon sheen and odours) were noted from the soils during the investigation.

6.2 Assessment Criteria for Soils

A generic quantitative risk assessment (GQRA) for human health has been undertaken in which the chemical testing results for soils have been assessed against generic assessment criteria (GAC) (also known as Soil Screening Values), with reference values obtained from the following:

1. Suitable 4 Use Levels (S4ULs) for human health risk assessment (Ref. M). This specifies S4ULs for a range of common contaminants above which the concentrations could pose an unacceptable risk to the health of site users which may warrant further investigation or remediation. S4ULs are specified for 6 categories of land use (residential with and without homegrown produce, allotments, commercial, public open space near residential housing and public parks).
2. Category 4 Screening Levels (C4SLs) (Refs. N & O). These were issued for a small number of substances to determine if a site is suitable for a proposed use and if such a site may be deemed to be contaminated in accordance with Part 2A of the Environmental Protection Act 1990. The C4SLs are specified for the same 6 categories of land use listed under 1 (above).
3. The CL:AIRE Soil Generic Assessment Criteria (GAC) for Human Health Risk Assessment (Ref. P). GACs are specified for 4 categories of land use (residential with and without homegrown produce, allotments and commercial).

For the purposes of this assessment the analytical results on the soil samples have been compared against the values for residential use with home grown produce, reflecting the proposed inclusion of shared private amenity space within the development with the assumption of soft landscaping and therefore the possibility of home grown produce.

For the assessment of organic compounds (such as polyaromatic hydrocarbons (PAHs) and petroleum hydrocarbons (TPHs)), assessment values relevant to a soil organic matter (SOM) content of 2.5% have been used based on the average SOM value determined from across the site of 3.15%.

A conceptual (source-pathway-receptor) model is required for the site in order to establish a risk. In this instance, the model would simply consist of any contamination (the 'source') in the ground passing via a 'pathway' (direct contact, or by plant root uptake from a derivative soil) to reach a 'receptor' (human (construction worker, resident / visitor), controlled waters, ecological or property).

This risk assessment considers the 'source' term initially. Where the source term is not considered to present a significant risk following the GQRA, then no further modelling is required.

6.3 Assessment of Results

The chemical laboratory results are provided in Appendix F and the soil contamination screening assessment for human health is provided in Appendix G with any exceedances above the soil screening values (SSVs) highlighted.

This has identified elevations above the SSVs in three polyaromatic hydrocarbon (PAH) compounds in one of ten samples tested (see Table 6). The elevated sample was from the Made Ground at 0.20-0.40m in WS01. However, the margins of exceedance were only slight and are believed to be derived from fall back of small fragments of asphalt into the sample from the surface. This location is also within the area of the proposed car park and therefore will not present a risk to end users.

Table 6: Elevations in PAHs above Soil Screening Values (GACs)

PAH Compound	GAC ¹ (mg/kg)	Concentrations Determined (mg/kg)
Sampling Point		WS01
Depth (m)		020-0.40
Benzo(b)fluoranthene	3.3	7.35
Benzo(a)pyrene	5	6
Dibenzo(a,h)anthracene	0.28	0.64

1. LQM CIEH S4ULs at 2.5% soil organic matter & C4SL for benzo(a)pyrene

With regard to the testing for pathogens², this has not identified any abnormal results that could be attributable to the former use of the site as milk depot. Two out of six samples were found to have high levels in clostridium perfringens which is a secondary indicator for faecal contamination. One of these locations (WS02A) is beneath the proposed car park at a depth of 0.42-0.54m and the sample above this depth at 0.20-0.29m at the same location had low levels. The other location (WS05) was below the northwestern corner of the site at a reasonable depth of 0.50-0.60m. A sample from WS04 at 0.37-0.60m begl was also elevated, but not to the same degree. No drains were penetrated during the investigation and testing for faecal enterococci determined levels below detection limits indicating no recent faecal contamination of the soil.

6.4 Removal of Soils from Site

For the purposes of surplus soil materials requiring excavation from the area of the proposed development for offsite disposal, testing for Waste Acceptance Criteria (WAC) was conducted on one composite sample from two incremental samples of the Made Ground from WS05 and WS06 at a depth of 0.11-0.60m begl. It should be noted that this test determines the appropriate category of landfill site for the material (inert, stable non-reactive hazardous waste or hazardous waste landfill) or whether pre-treatment is required. It is not a test for the waste classification of the soil.

The WAC testing results are included in Appendix F and show that the Made Ground meets the criteria for acceptance at an inert waste landfill. It should be noted that this excludes any asphalt surfacing which will require disposal as a separate waste stream.

² The previous use of the site as a milk depot was identified as a potential source of pathogens (infectious micro-organism or agent).

7.0 REFINED CONCEPTUAL SITE MODEL & GEO-ENVIRONMENTAL RISK ASSESSMENT

7.1 Refined Conceptual Site Model

The Preliminary Conceptual Site Model (CSM) provided in the Phase 1 desk study has been revised following completion of the Phase 2 investigation and is presented below.

Table 7: Refined Conceptual Site Model

Potential Pollutant (Source)	Potential Linkage (Pathway)	Receptor
<p>On Site: Milk depot. Demolition of building. Made Ground relating to historical use. Fly tipping. Potential asbestos containing materials (ACMs) within historic building or in fly tipping. Potential unrecorded mine entries. Buried WWII Unexploded Ordnance (UXO). Radon gas.</p> <p>Identified Soil Contaminants: – Isolated low level PAHs in the Made Ground at 1 of the 7 locations (WS01); – Sporadic historical faecal contamination at 3no. locations (WS02A, WS04 & WS05).</p> <p>Off Site: Milk depot (adj.) Electricity substations. Farm. Vehicle hire & rental. Vehicle tyre fitters. Areas of recorded Made Ground. Infilled pond. Infilled reservoir. Non coal mining of iron ore. Potential unrecorded mine entries. Radon gas.</p>	<p>Emission, migration, and inhalation of gases / vapours.</p> <p>Inhalation of soil, water, or dust.</p> <p>Dermal contact with / ingestion of contaminated soil, water, dust.</p> <p>Migration / leaching, runoff and percolation through soils and rock joints.</p> <p>Volatisation of contaminants to indoor or outdoor air.</p> <p>Service pipes.</p> <p>Physical disturbance.</p> <p>Ground instability / differential settlement.</p>	<p>Construction workers.</p> <p>Site end users (residents and their visitors).</p> <p>Neighbouring occupants (residents).</p> <p>Groundwater in Secondary A Aquifer of high vulnerability protected by surface soils of low leachable class.</p> <p>Surface waters (unnamed tributary of Cudworth Dike 326m SE).</p> <p>Ecology (Dearne Valley Park Local Nature Reserve 1666m S).</p> <p>Property (existing site buildings, proposed development, neighbouring residential properties and local road infrastructure and utilities).</p>

7.2 Revised Geo-Environmental Risk Assessment

This section aims to expand the CSM to reassess the level of risk for each potential pollutant linkage following completion of the investigation and the updated assessment is provided in Table 8.

Table 8: Revised Geo-Environmental Risk Assessment

Receptor	Potential Pollutant Linkage	Estimated Degree of Risk to Receptor
Construction Workers	Migration and inhalation of ground gas (methane & carbon dioxide).	Low
	Migration and inhalation of radon gas.	Low
	Physical disturbance (of buried WWII UXO).	Low
	Inhalation of soil, water, or dust.	Low / Moderate*
	Dermal contact with/ ingestion of contaminated soil / water / dust.	Low / Moderate*
	Volatilisation of contaminants to indoor or outdoor air.	Low
Site End Users (Residents & their Visitors)	Migration and inhalation of ground gas (methane & carbon dioxide).	Low
	Migration and inhalation of radon gas.	Low***
	Inhalation of soil / water or dust (from areas of proposed soft landscaping).	Low / Moderate
	Dermal contact with / ingestion of contaminated soil / water / dust (from areas of proposed soft landscaping).	Low / Moderate
	Volatilisation of contaminants to indoor or outdoor air.	Low
Neighbouring Occupants	Migration and inhalation of ground gas (methane & carbon dioxide).	Low
	Migration / leaching / runoff.	Low**
	Inhalation of soil, water, or dust.	Low**
	Dermal contact with / ingestion of contaminated soil / water / dust.	Low**
Surface Water	Migration / leaching / runoff.	Very Low**
Groundwater	Migration / leaching / runoff.	Low**
Ecological Systems	Habitat disturbance (physical, noise, dust), migration / leaching / runoff.	Very Low**
Property (Land & Buildings)	Migration, accumulation, and ignition of methane.	Very Low
	Migration / leaching / runoff.	Low**
	Ground instability / differential settlement (to proposed on site development) associated with unknown depth and strength of superficial soils and depth to bedrock on site.	Low
	Slope instability (to proposed onsite development).	Low

* Assumes basic PPE is used (including gloves and long-sleeved overalls).

** Assumes good site construction practice, including, relevant reports, control of runoff / spillages and dust control.

*** Assumes provision of basic radon protection measures for any new permanent buildings.

In this risk assessment, an overall **Very Low to Moderate** risk is applicable following completion of the intrusive site investigation.

8.0 CONCLUSIONS AND RECOMMENDATIONS

8.1 Overview

Based on the proposed development of two detached two-storey blocks of assisted living residential apartments with shared private amenity space including soft landscaping, it is considered that the proposed development presents an overall **Very Low to Moderate** geo-environmental risk. The main risks relate to construction workers and site end users (residents and visitors) from sporadic historical faecal contamination identified at two locations.

The ground investigation undertaken for this report has involved windowless sampling boreholes at seven locations to depths of between 1.28 and 2.19m begl with in-situ geotechnical testing, permeability testing and soil sampling for chemical and geotechnical laboratory testing.

The purpose of the investigation was to characterise ground conditions, to assess the feasibility of soakaway drainage of roof water, determine geotechnical parameters to inform foundation design and to assess the contamination risk to construction workers and site end users to ensure suitability for use.

The investigation encountered Made Ground at all locations which was proven to its full depth which ranged between 0.40 and 0.80m begl. The Made Ground comprised predominantly granular material with a concrete and / or asphalt capping above a sandy gravel (or gravelly sand) of mostly sandstone, pebbles, brick and concrete with occasional coal and clinker and small fragments of ceramic tile, glass and timber. A small proportion of cohesive material was also encountered generally at or close to the base of the Made Ground as a slightly gravelly sandy silt and a slightly gravelly sandy clay.

Natural soils below the Made Ground were encountered to depths of between 0.90 and 1.80m begl and comprised predominantly granular material of slightly clayey sandy gravel of sandstone with sandstone cobbles or as a slightly clayey gravelly sand with gravel of sandstone, both constituting either residual weathered sandstone or highly weathered sandstone.

The depth to bedrock ranged between 0.90 and 1.80m begl across the site and was encountered as an orangey brown highly weathered sandstone.

Whilst some moist strata was recorded at one location (WS06 at 1.35-1.70m begl), no groundwater ingress was encountered during the investigation. However, it should be noted that groundwater levels can vary on a seasonal basis and therefore may be higher during winter months.

8.2 Geotechnical

Made Ground extends to depths of between 0.40 and 0.80m begl. Foundations should not be constructed upon or within this Made Ground as it is variable in nature and could result in excessive differential settlement.

The natural soils underlying the Made Ground are predominantly granular in nature but have a variable strength with SPT results for depths between 0.50 and 1.00m begl indicating a loose to medium dense material which will be unsuitable as a founding medium.

On this basis, it is considered that the use of traditional strip footings founded on bedrock from depths at 1.00-1.80m begl will be feasible where adequate bearing and low risk of excessive and/or differential settlement is likely to be experienced with an approximate allowable bearing capacity in excess of 200kN/m².

Excavations for foundations should be inspected and any soft spots removed and replaced with a suitably approved grade of engineering fill to further alleviate the risk of differential settlement.

No groundwater ingress was recorded during the investigation and therefore the provision of a shoring and sump arrangement is unlikely to be required for any deep excavation. However, it should be noted that groundwater levels can vary on a seasonal basis and therefore may be higher during winter months.

Permeability testing at two of the windowless sampling locations (both within the proposed car park) has shown very slow infiltration rates which means that the soils are unsuitable for soakaway drainage based on the tests conducted.

8.3 Contamination

The soil contamination assessment for human health has been completed based on residential use with the potential for home grown produce which is the most sensitive end use. This identified elevated concentrations above soil screening values (SSVs) in three polycyclic aromatic hydrocarbon (PAH) compounds in one of ten samples tested. The elevated sample was from the Made Ground at 0.20-0.40m in WS01. However, the margins of exceedance were only slight (see Table 6) and the elevations are believed to originate from fall back of small fragments of asphalt into the sample from the surface and therefore represent a false result. This location is also within the area of the proposed car park and therefore will not present a risk to end users.

Areas of existing asphalt surfacing exist within or close to the area proposed for shared private amenity space which is anticipated will include some soft landscaping. Removal of areas of the old asphalt should therefore be undertaken carefully to avoid introducing asphalt fragments into the subsurface where they may form part of any imported soil layers. The asphalt surfacing, once removed, should be stockpiled separately from the other Made Ground materials destined for offsite disposal.

With regard to the testing for pathogens, this has not identified any abnormal results that could be attributable to the former use of the site as milk depot. However, faecal contamination has been identified with two out of six samples having recorded high levels in clostridium perfringens, a secondary indicator for faecal contamination. One of these locations (WS02A) was beneath the proposed car park at a depth of 0.42-0.54m and the sample above this depth at 0.20-0.29m at the same location had low levels. The other location was below the northwestern corner of the site (WS05) at a depth of 0.50-0.60m begl. A sample from WS04 at 0.37-0.60m begl was also elevated, but not to the same degree.

The potential source of the faecal contamination is unknown. No drains were penetrated during the investigation and testing for faecal enterococci determined levels below detection limits indicating no recent faecal contamination of the soil.

The use of the appropriate Personal Protection Equipment (PPE) and hygiene protocols to ground workers is therefore recommended (see Section 8.4 below). With regard to the potential risk to future occupants, the horizons in which the faecal contamination have been identified are at depths of less than 0.60m begl and therefore render the soils unsuitable for use for the growing of home grown produce. Options to overcome this risk include the provision of a clean cover system³ within the area of the proposed private amenity space or for the installation of an impermeable play area surfacing upon which raised beds could be constructed for the growing of home grown produce if desired. A Remediation Strategy discussing these options and detailing the desired option will need to be submitted to the Local Authority for approval.

8.4 Protection to Construction Workers

Construction workers should use the appropriate Personal Protection Equipment (PPE). This should include (but not necessarily be limited to) long sleeved overalls, gloves and protective footwear. Workers should also adhere to good site hygiene practice with the use of washing facilities before the consumption of food. Notices should be issued advising adherence to this requirement to encourage compliance. This is particularly important for ground workers.

8.5 Material Reuse

It is considered that any natural soils that may be excavated for foundations during the development, may be considered suitable for reuse on site as general fill due its predominantly granular nature.

8.6 Removal of Materials from Site

Testing for Waste Acceptance Criteria (WAC) has been completed on one composite sample from two incremental samples of the Made Ground from WS05 and WS06 at a depth of 0.11-0.60m begl. This found that the Made Ground meets the criteria for acceptance at an inert waste landfill. It should be noted that this excludes any asphalt surfacing which will require disposal as a separate waste stream.

³ A clean cover system involves the removal of the soils to a minimum depth of 600mm below finished garden level and replacement with imported soils that have been chemically validated to be clean.

Technical Guidance Waste Management Paper 3 (May 2021) (Ref. Q) requires the waste disposal facility to make an appropriate assessment of the waste classification. Therefore, a final assessment will be undertaken by the receiving landfill based on the requirements of their permit.

When submitting the WAC testing results to waste operators, the soil testing data appended to this report (Appendix F) should also be included.

Removal of surplus soils should be carried out by a registered waste carrier to an appropriately licensed waste management facility with waste transfer documentation being provided and retained for future reference.

8.7 Protection of Underground Services

With regard to the provision of new services, it should be noted that the requirements vary between different service providers and it would be advisable to discuss the service providers' requirements alongside the chemical testing results appended to this report. This is particularly important for water supply pipes.

8.8 Unforeseen Contamination (Discover Strategy)

From the time development commences on site, ongoing monitoring of any sub-surface materials exposed should take place. Should any unusual, oily, brightly coloured or odorous material, or unexpected buried tanks, containers or suspicious materials / items be encountered, the advice of a suitably qualified specialist should be sought.

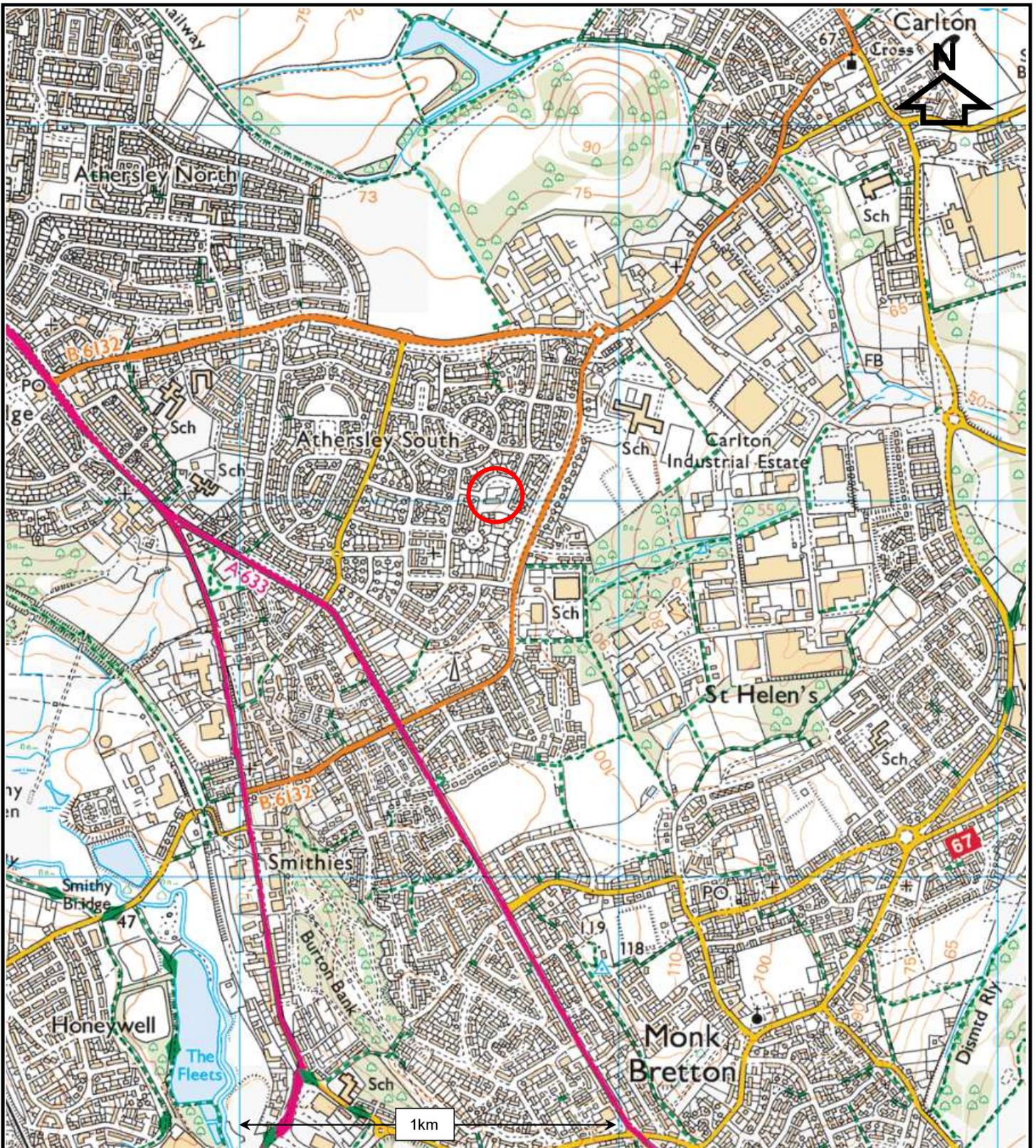
APPENDIX A

Figures

Figure 1: Site Location

Figure 2: Exploration Hole Locations – Existing Layout

Figure 3: Exploration Hole Locations – Proposed Layout



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Project No: 24246
Client: Alpha Dora Property Group Ltd
Project: Land between Cromford Av & Blackheath Rd,
 Athersley South, Barnsley, S71 3SY
Date: October 2024

Title:

Site Location

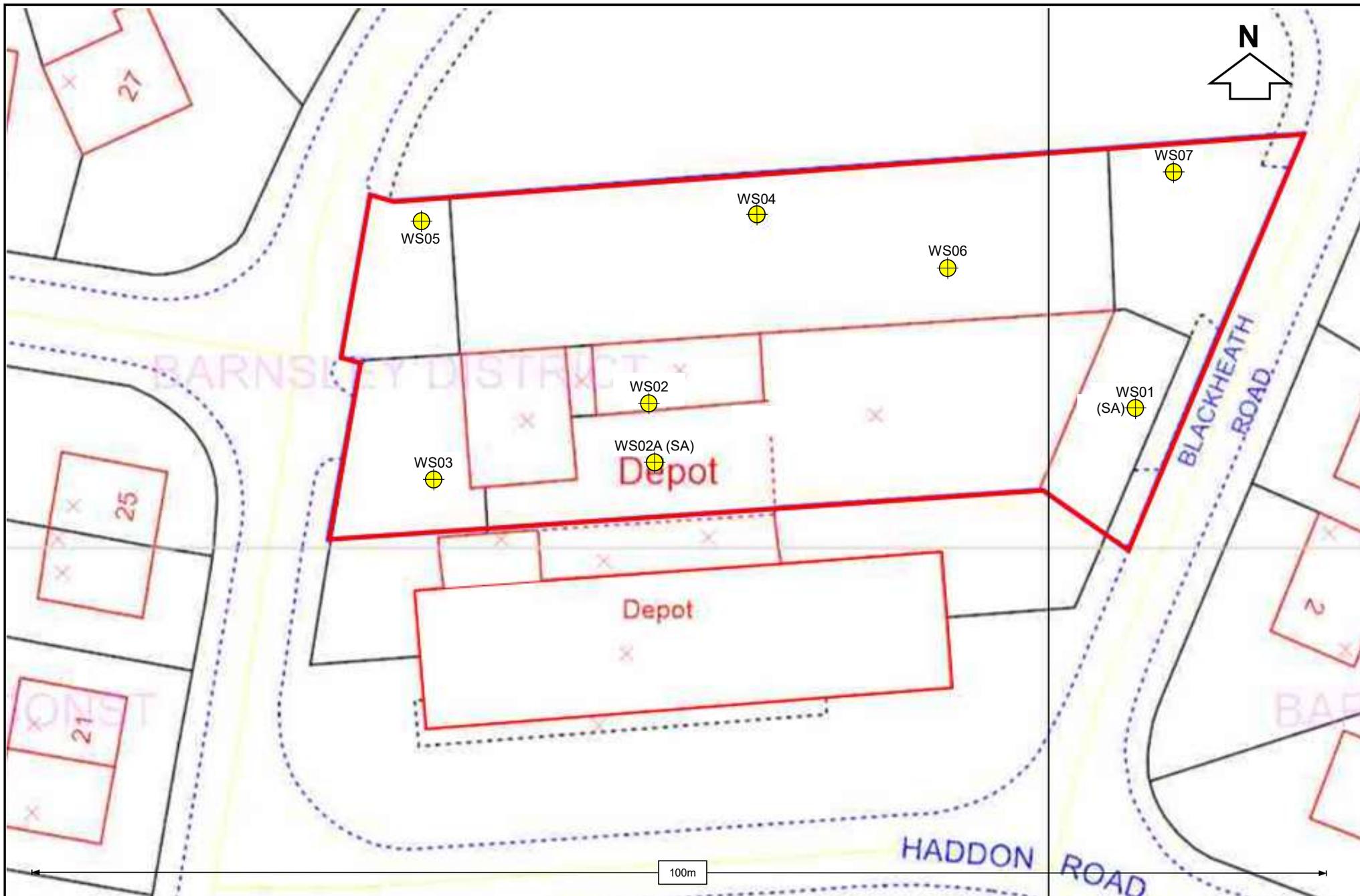
Key:

 Site Location

Scale: Grid squares are 1km



Fig:
1



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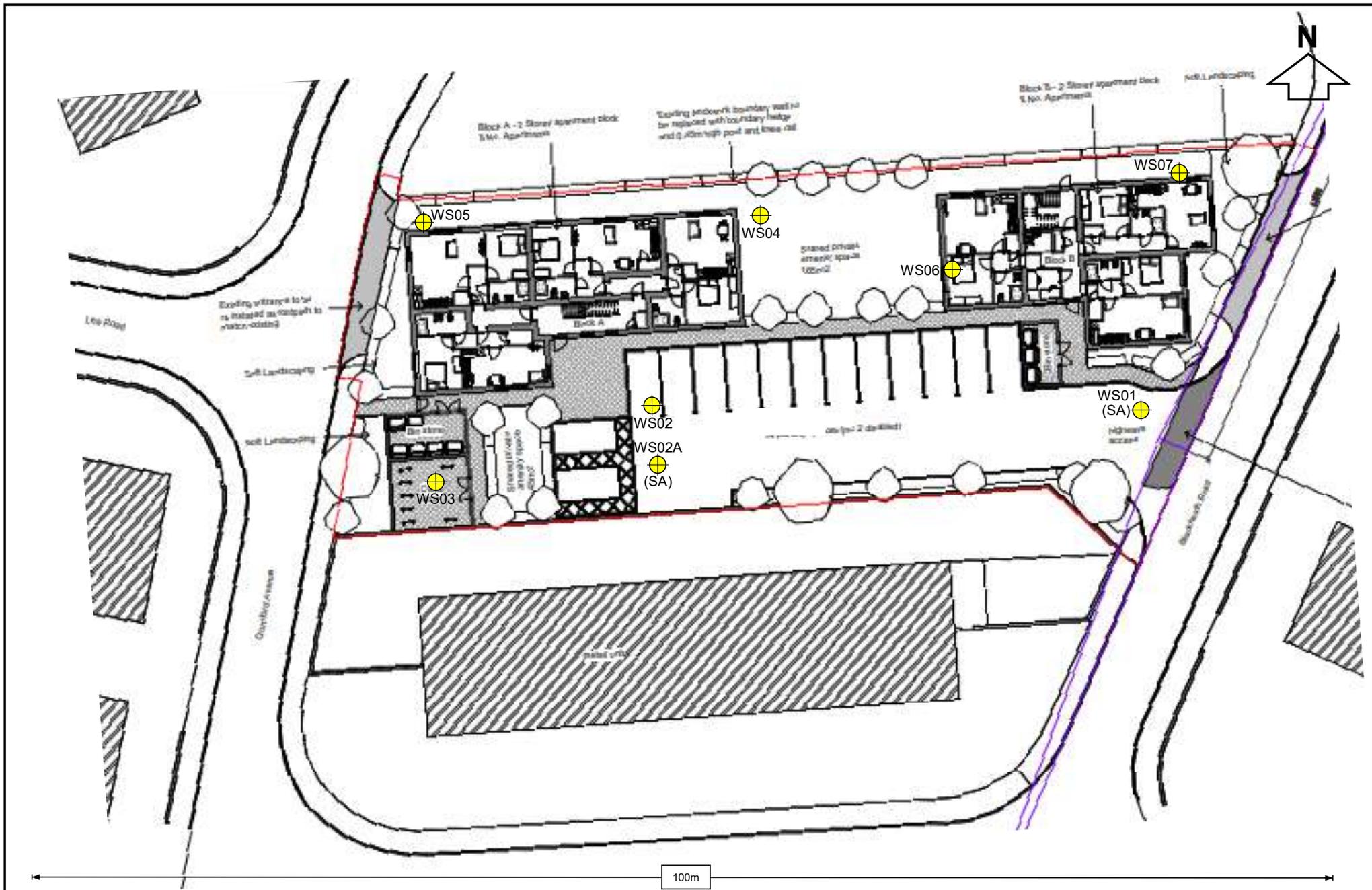
Key:

- Site Boundary
- ⊕ WS02 (SA) Windowless Sampling location (with soakaway testing location)

Project No: 24246
Client: Alpha Dora Property Group
Project: Land between Cromford Av & Blackheath Rd, Athersley South, Barnsley, S71 3SY
Date: May 2025

Title:
Exploration Hole Locations - Existing Layout

Fig: 2



Base plan taken from Ropergate Architecture Proposed Siteplan, drawing ref. HR- RA- XX- XX- DR- A- (03)04/A, dated 31/05/2024

SILKSTONE ENVIRONMENTAL
 GEOTECHNICAL, PLANNING & SURVEYING CONSULTANTS
 A PHENNA GROUP COMPANY

Key:	Site Boundary
WS02 (SA)	Windowless Sampling location (with soakaway testing location)

Project No:	24246
Client:	Alpha Dora Property Group
Project:	Land between Cromford Av & Blackheath Rd, Athersley South, Barnsley, S71 3SY
Date:	May 2025

Title:	Exploration Hole Locations - Proposed Layout
Fig: 3	

APPENDIX B

Exploration Hole Logs

WINDOW SAMPLE LOG

Project Land between Cronford Avenue & Blackheath Road, Athersley South, Barnsley, S71 3SY				Window Sample No WS01
Job No 24246	Date 15-04-25	Ground Level (m)	Co-Ordinates ()	
Contractor Geoenvironmental Drilling Ltd				Sheet 1 of 1

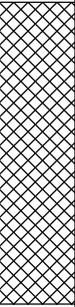
SAMPLES & TESTS			STRATA					Geology	Instrument/ Backfill
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	DESCRIPTION		
						0.08	MADE GROUND: Dark grey ASPHALT.		
0.10-0.20	ES1	N15				(0.12)	MADE GROUND: Light greyish brown very sandy GRAVEL of angular to rounded fine to coarse quartzite pebbles, sandstone, brick and concrete with low to medium cobble content of angular sandstone and concrete (granular sub base).		
0.20-0.40	ES2					(0.20)			MADE GROUND: Grey slightly gravelly sandy SILT (TOPSOIL). Gravel is angular fine to coarse of sandstone, mudstone and occasional brick.
0.50	D3						(1.00)		Medium dense orangey brown slightly gravelly locally slightly clayey SAND with low to medium cobble content of sandstone. Gravel is angular fine to coarse of sandstone (RESIDUAL WEATHERED SANDSTONE).
0.53-0.63	B4								
0.63-1.70		N51/ 250 mm				1.40	Orangey brown sandy GRAVEL of angular fine to coarse sandstone and occasional brown ironstone with medium cobble content of angular sandstone (HIGHLY WEATHERED SANDSTONE).		
						(0.30)			1.70
1.70							(0.40)		2.10
							Terminated on SPT refusal in sandstone at 2.10m begl.		

WINDOW SAMPLE LOG 3M 24246 HADDON ROAD, BARNESLEY (WS & SA) GPJ GINT STD AGS 3.1.GDT 4/6/25

Hole Progress and Water Observations						Window Sample Recovery				GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Dia (m)	Rec (%)	
										1. Hand dug pit followed by windowless sampling. 2. No groundwater encountered. 3. No visual or olfactory evidence of potential contamination. 4. Soakaway testing completed 1.00-1.70m begl.
All dimensions in metres Scale 1:15.625						Client Alpha Dora Property Group Ltd		Method/ Plant Used Archway Competitor		

WINDOW SAMPLE LOG

Project Land between Cronford Avenue & Blackheath Road, Athersley South, Barnsley, S71 3SY				Window Sample No WS02
Job No 24246	Date 15-04-25	Ground Level (m)	Co-Ordinates ()	
Contractor Geoenvironmental Drilling Ltd				Sheet 1 of 1

SAMPLES & TESTS			STRATA					Geology	Instrument/ Backfill
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	DESCRIPTION		
						(0.25) 0.25	MADE GROUND: Light yellowish white CONCRETE with 12mm diameter reinforcement mesh 80mm begl.		
							Hole aborted due to excessive thickness of concrete (>250mm).		

WINDOW SAMPLE LOG 3M 24246 HADDON ROAD, BARNESLEY (WS & SA), GPJ GINT STD ACS 3_1.GDT 4/6/25

Hole Progress and Water Observations						Window Sample Recovery				GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Dia (m)	Rec (%)	
										1. Hand dug inspection pit using mechanical breaker. 2. No groundwater encountered. 3. No visual or olfactory evidence of potential contamination.

All dimensions in metres Scale 1:6.25	Client Alpha Dora Property Group Ltd	Method/ Plant Used Mechanical breaker	Logged By N Pickard
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WINDOW SAMPLE LOG

Project Land between Cronford Avenue & Blackheath Road, Athersley South, Barnsley, S71 3SY				Window Sample No WS02A
Job No 24246	Date 15-04-25	Ground Level (m)	Co-Ordinates ()	
Contractor Geoenvironmental Drilling Ltd				Sheet 1 of 1

SAMPLES & TESTS			STRATA					Geology	Instrument/ Backfill
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	DESCRIPTION		
						(0.15) 0.15	MADE GROUND: Light yellowish white CONCRETE.		
0.20-0.29	ES1					(0.14) 0.29	MADE GROUND: Dark grey sandy angular to rounded fine to coarse GRAVEL of sandstone, concrete, brick, stone pebbles and occasional ceramic tile and clinker with fine rootlets. Medium cobble content of angular sandstone and brick.		
0.29-0.42	ES2					(0.13) 0.42			
0.42-0.54	ES3					(0.12) 0.54	MADE GROUND: Light greyish brown sandy angular to rounded fine to coarse GRAVEL of stone pebbles, sandstone, concrete and occasional brick with isolated gravel sized fragment of glass and low to medium cobble content of angular sandstone and concrete (granular sub base).		
0.69-1.80 0.70	B4	N17				(0.15) 0.69	MADE GROUND: Brownish dark grey slightly gravelly sandy CLAY. Gravel is angular to subangular fine to coarse of sandstone, concrete and occasional brick and coal.		
						(1.11)	Orangey brown slightly gravelly sandy CLAY. Gravel is angular to subangular fine to coarse of sandstone and occasional coal (RESIDUAL WEATHERED SANDSTONE). Medium dense brown becoming orangey brown slightly clayey very sandy GRAVEL of angular to subangular fine to coarse sandstone with medium cobble content of subrounded sandstone (HIGHLY WEATHERED SANDSTONE).		
1.60-1.70	D5					1.80			
1.80		N50/ 170 mm				(0.19) 1.99	Orangey brown weathered SANDSTONE.		
							Terminated on SPT refusal in sandstone at 1.99m begl.		

WINDOW SAMPLE LOG 3M 24246 HADDON ROAD, BARNESLEY (WS & SA) GPJ GINT STD ACS 3_1.GDT 5/6/25

Hole Progress and Water Observations						Window Sample Recovery				GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Dia (m)	Rec (%)	
										1. Hand dug pit followed by windowless sampling. 2. No groundwater encountered. 3. No visual or olfactory evidence of potential contamination. 4. Soakaway testing completed 1.00-1.80m begl.
All dimensions in metres Scale 1:15.625						Client Alpha Dora Property Group Ltd		Method/ Plant Used Archway Competitor		

WINDOW SAMPLE LOG

Project Land between Cronford Avenue & Blackheath Road, Athersley South, Barnsley, S71 3SY				Window Sample No WS03
Job No 24246	Date 15-04-25	Ground Level (m)	Co-Ordinates ()	
Contractor Geoenvironmental Drilling Ltd				Sheet 1 of 1

SAMPLES & TESTS			STRATA					Geology	Instrument/ Backfill
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	DESCRIPTION		
0.35-0.50 0.40-0.45 0.50-0.60 1.00	ES1 ES2 ES3	N50/ 280 mm				(0.20)	MADE GROUND: Light yellowish white CONCRETE with 5mm diameter reinforcement mesh 100mm begl.		
						0.20	MADE GROUND: Light greyish brown gravelly SAND. Gravel is angular to rounded fine to coarse of concrete and stone pebbles (granular sub base).		
						0.35	MADE GROUND: Brownish dark grey slightly gravelly sandy CLAY. Gravel is angular to subangular fine to medium of sandstone and occasional coal.		
					0.50	Orangey brown slightly gravelly clayey SAND. Gravel is angular to subangular fine to coarse of sandstone (RESIDUAL WEATHERED SANDSTONE).			
					0.60	Orangey brown slightly clayey sandy GRAVEL with low to medium cobble content of angular sandstone. Gravel is angular to subangular fine to coarse of sandstone (RESIDUAL WEATHERED SANDSTONE).			
					0.90	Orangey brown cobbly SANDSTONE (HIGHLY WEATHERED SANDSTONE BEDROCK).			
						(0.53)			
						1.43	Terminated on SPT refusal in sandstone at 1.43m begl.		

WINDOW SAMPLE LOG 3M_24246 HADDON ROAD, BARNSELEY (WS & SA). GPJ_GINT STD_ACS 3_1.GDT_4/6/25

Hole Progress and Water Observations						Window Sample Recovery				GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Dia (m)	Rec (%)	
										1. Hand dug inspection pit followed by windowless sampling. 2. No groundwater encountered. 3. No visual or olfactory evidence of potential contamination.

All dimensions in metres Scale 1:15.625	Client Alpha Dora Property Group Ltd	Method/ Plant Used Archway Competitor	Logged By N Pickard
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WINDOW SAMPLE LOG

Project Land between Cronford Avenue & Blackheath Road, Athersley South, Barnsley, S71 3SY				Window Sample No WS04
Job No 24246	Date 15-04-25	Ground Level (m)	Co-Ordinates ()	
Contractor Geoenvironmental Drilling Ltd				Sheet 1 of 1

SAMPLES & TESTS			STRATA					Geology	Instrument/ Backfill
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	DESCRIPTION		
0.17-0.37	ES1					(0.17) 0.17	MADE GROUND: Light greyish whiter CONCRETE.		
0.37-0.60	ES2					(0.20) 0.37	MADE GROUND: Light greyish brown and orangey brown gravelly SAND with low to medium cobble content of angular to subangular sandstone. Gravel is angular to subangular fine to coarse of similar lithology (granular sub base).		
0.63-0.67 0.67-1.00	D3 B4					(0.23) 0.60	MADE GROUND: Dark grey slightly gravelly sandy CLAY. Gravel is angular to subangular fine to coarse of sandstone and occasional brick.		
1.00	N50/ 130 mm					(0.63) 1.00	MADE GROUND: Orangey brown slightly gravelly clayey SAND. Gravel is angular to subangular fine to coarse of sandstone and brick masonry. Orangey brown slightly clayey sandy GRAVEL with low cobble content of angular sandstone, becoming less clayey with depth. Gravel is angular fine to coarse of similar lithology (HIGHLY WEATHERED SANDSTONE).		
						(0.37) 1.00	Orangey brown highly weathered SANDSTONE.		
						(0.28) 1.28	Terminated on SPT refusal in sandstone at 1.28m begl.		

WINDOW SAMPLE LOG 3M_24246 HADDON ROAD, BARNESLEY (WS & SA). GPJ GINT STD_ACS 3_1.GDT 4/6/25

Hole Progress and Water Observations						Window Sample Recovery				GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Dia (m)	Rec (%)	
										1. Hand dug inspection pit followed by windowless sampling. 2. No groundwater encountered. 3. No visual or olfactory evidence of potential contamination.
All dimensions in metres Scale 1:15.625						Client Alpha Dora Property Group Ltd		Method/ Plant Used Archway Competitor		

WINDOW SAMPLE LOG

Project Land between Cronford Avenue & Blackheath Road, Athersley South, Barnsley, S71 3SY				Window Sample No WS05
Job No 24246	Date 16-04-25	Ground Level (m)	Co-Ordinates ()	
Contractor Geoenvironmental Drilling Ltd				Sheet 1 of 1

SAMPLES & TESTS			STRATA					Geology	Instrument/ Backfill
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	DESCRIPTION		
0.21-0.60	ES1					0.02	MADE GROUND: Dark grey asphalt.		
						(0.19)	MADE GROUND: Light greyish white CONCRETE.		
0.50-0.60	ES2					0.21	MADE GROUND: Light greyish brown gravelly SAND with low to medium cobble content of angular sandstone, concrete and occasional brick. Gravel is angular fine to coarse of similar lithology (granular sub base).		
						(0.29)			
1.00	B3	N25				0.50	MADE GROUND: Dark grey slightly silty slightly gravelly SAND. Gravel is angular to subangular fine to coarse of sandstone and occasional brick.		
						(0.60)			
1.10-2.19	B3					0.80	MADE GROUND: Greyish orange slightly clayey slightly gravelly sandy SILT. Gravel is angular to subangular fine to coarse of sandstone and occasional coal (REWORKED NATURAL MATERIAL).		
						(0.20)			
1.50-1.65	D4					1.00	Brown slightly gravelly clayey SAND. Gravel is angular to subangular fine to coarse of sandstone (RESIDUAL WEATHERED SANDSTONE).		
						(0.30)			
1.80		N50/ 240 mm				1.10	Medium dense orangey brown slightly clayey gravelly SAND. Gravel is angular to subangular fine to coarse of sandstone (RESIDUAL WEATHERED SANDSTONE).		
						(0.40)			
						1.50	Stiff to very stiff brown slightly gravelly sandy CLAY. Gravel is angular to subangular fine to coarse of sandstone (RESIDUAL WEATHERED SANDSTONE).		
						(0.15)			
						1.65	Medium dense to dense brown slightly clayey sandy GRAVEL of angular to subangular sandstone with medium cobble content of similar lithology (HIGHLY WEATHERED SANDSTONE).		
						(0.15)			
						1.80	Orangey brown highly weathered SANDSTONE.		
						(0.39)			
						2.19	Terminated on SPT refusal in sandstone at 2.19m begl.		

WINDOW SAMPLE LOG 3M 24246 HADDON ROAD, BARNSELY (WS & SA) GPJ GINT STD ACS 3_1.GDT 5/6/25

Hole Progress and Water Observations						Window Sample Recovery				GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Dia (m)	Rec (%)	
										1. Hand dug inspection pit followed by windowless sampling. 2. No groundwater encountered. 3. No visual or olfactory evidence of potential contamination.

All dimensions in metres Scale 1:15.625	Client Alpha Dora Property Group Ltd	Method/ Plant Used Archway Competitor	Logged By N Pickard
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WINDOW SAMPLE LOG

Project Land between Cronford Avenue & Blackheath Road, Athersley South, Barnsley, S71 3SY				Window Sample No WS06
Job No 24246	Date 16-04-25	Ground Level (m)	Co-Ordinates ()	
Contractor Geoenvironmental Drilling Ltd				Sheet 1 of 1

SAMPLES & TESTS			STRATA					Geology	Instrument/ Backfill
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	DESCRIPTION		
0.13-0.29	ES1	N7				0.02	MADE GROUND: Dark grey asphalt.		
0.13-0.35	ES2					0.13	MADE GROUND: Light greyish white CONCRETE with 5mm diameter reinforcement mesh at base.		
				(0.16)		MADE GROUND: Light brown sandy subrounded fine to coarse GRAVEL of sandstone (granular sub base).			
0.29-0.45	ES3			0.29		MADE GROUND: Brownish dark grey slightly clayey sandy GRAVEL of angular to subangular sandstone and brick with medium cobbled content of angular sandstone and brick masonry. Occasional small gravel sized fragments of timber and glass.			
						0.45	MADE GROUND: Orangey brown sandy GRAVEL of angular to subangular fine to coarse sandstone (POSSIBLE REWORKED NATURAL MATERIAL).		
						0.53	Loose to medium dense orangey brown sandy GRAVEL of angular to subangular fine to coarse sandstone with low to medium cobbled content of similar lithology (RESIDUAL WEATHERED SANDSTONE).		
1.00						(1.17)			
1.35-1.45	D4	N50/ 200 mm				1.70	1.35 - 1.70 Strata moist.		
1.70						(0.35)	Orangey brown highly weathered SANDSTONE.		
						2.05	Terminated on SPT refusal in sandstone at 2.05m begl.		

WINDOW SAMPLE LOG 3M_24246 HADDON ROAD, BARNESLEY (WS & SA) GPJ_GINT STD_ACS 3_1.GDT_4/6/25

Hole Progress and Water Observations						Window Sample Recovery				GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Dia (m)	Rec (%)	
										1. Hand dug inspection pit followed by windowless sampling. 2. Strata moist between 1.35 and 1.70m begl. 3. No visual or olfactory evidence of potential contamination.
All dimensions in metres Scale 1:15.625						Client Alpha Dora Property Group Ltd		Method/ Plant Used Archway Competitor		

WINDOW SAMPLE LOG

Project Land between Cronford Avenue & Blackheath Road, Athersley South, Barnsley, S71 3SY				Window Sample No WS07
Job No 24246	Date 16-04-25	Ground Level (m)	Co-Ordinates ()	
Contractor Geoenvironmental Drilling Ltd				Sheet 1 of 1

SAMPLES & TESTS			STRATA					Geology	Instrument/ Backfill
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	DESCRIPTION		
0.28-0.46	ES1					(0.21)	MADE GROUND: Light greyish white CONCRETE.		
						0.21			
0.46-0.51	ES2					(0.18)	MADE GROUND: Light brown sandy subrounded fine to coarse GRAVEL of sandstone (granular sub base).		
						0.46	MADE GROUND: Brownish grey slightly sandy angular to subangular fine to coarse GRAVEL of sandstone, brick and occasional coal with low to medium cobble content of angular sandstone and ceramic drain fragment.		
1.00		N50/ 280 mm				(0.49)	MADE GROUND: Grey slightly gravelly silty SAND. Gravel is angular fine of sandstone and brick (possible old topsoil). Orangey brown gravelly SAND. Gravel is angular to subangular fine to coarse of sandstone (RESIDUAL WEATHERED SANDSTONE).		
						1.00			
						(0.28)	Orangey brown highly weathered SANDSTONE recovered as a very dense sandy angular to subangular fine to coarse gravel with low to medium cobble content.		
						1.28	Terminated on SPT refusal in sandstone at 1.28m begl.		

WINDOW SAMPLE LOG 3M_24246 HADDON ROAD, BARNESLEY (WS & SA). GPJ GINT STD_ACS 3_1.GDT 4/6/25

Hole Progress and Water Observations						Window Sample Recovery				GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Dia (m)	Rec (%)	
										1. Hand dug inspection pit followed by windowless sampling. 2. No groundwater encountered. 3. No visual or olfactory evidence of potential contamination.

All dimensions in metres Scale 1:15.625	Client Alpha Dora Property Group Ltd	Method/ Plant Used Archway Competitor	Logged By N Pickard
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APPENDIX C

Photographic Record



Photo 1: Site Condition – View of the Cromford Avenue frontage looking southeast, showing former site entrance.



Photo 2: Site Condition – View north along the western edge of the site.



Photo 3: Site Condition – View across the site looking east from near the northwestern corner showing northern site boundary (left).



Photo 4: Site Condition – View across the site looking west from near the northeastern corner showing northern site boundary (right).



Photo 5: Site Condition – View south along the eastern edge of the site towards Haddon Road from near the northeastern corner.



Photo 6: Site Condition – View north along the eastern site boundary with Blackheath Road.



Photo 7: 15/04/2025 WS01 – Hand dug inspection pit excavated prior to windowless sampling.



Photo 8: 15/04/2025 WS01 – Close up of hand dug pit.



Photo 9: 15/04/2025 WS01 – Soils recovered from hand dug pit to 0.53m begl (depth progressing from left to right). Tape is extended to 1.00m.



Photo 10: 15/04/2025 WS01 – Recovered soil cores following penetration by windowless sampling to 1.70m begl (depth progressing left to right and from top (0.53-1.00m) to bottom (1.00-1.70m)).



Photo 11: 15/04/2025 WS02 – Hand dug inspection pit aborted in reinforced concrete at 0.25m begl.



Photo 12: 15/04/2025 WS02A – Hand dug inspection pit.



Photo 13: 15/04/2025 WS02A – Close up of hand dug pit.



Photo 14: 15/04/2025 WS02A – Soils recovered from hand dug pit to 0.69m begl (depth progressing from left to right). Tape is extended to 1.00m.



Photo 15: 15/04/2025 WS02A – Recovered soil cores following penetration by windowless sampling to 1.80m begl (depth progressing left to right and from top to bottom).



Photo 16: 15/04/2025 WS02A – Recovered SPT sample following refusal at 1.99m begl (depth progressing left to right). The observed wet section of sample resulted from the soakaway testing.

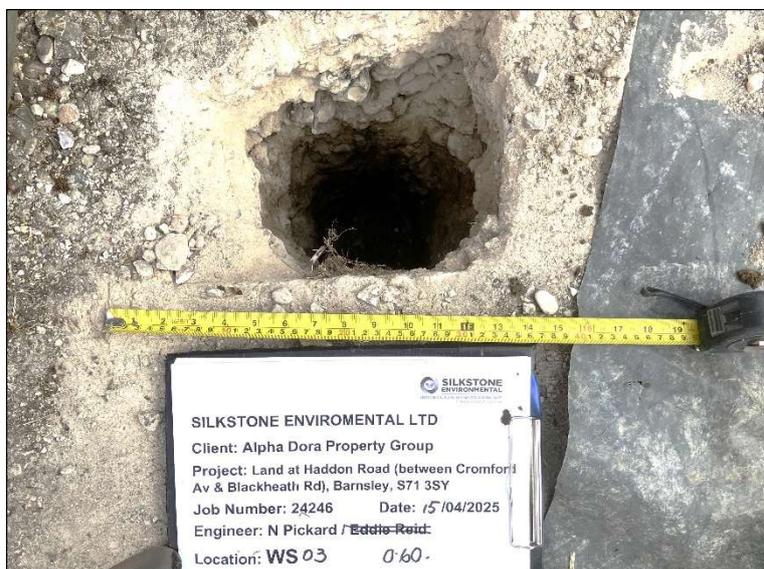


Photo 17: 15/04/2025 WS03 – Hand dug inspection pit.



Photo 18: 15/04/2025 WS03 – Close up of hand dug pit.



Photo 19: 15/04/2025 WS03 – Soils recovered from hand dug pit to 0.60m begl (depth progressing from left to right). Tape is extended to 1.00m.



Photo 20: 15/04/2025 WS03 – Recovered soil cores following penetration by windowless sampling to 1.00m begl and SPT refusal at 1.43m begl (depth progressing left to right). Tape is extended to 1.00m.

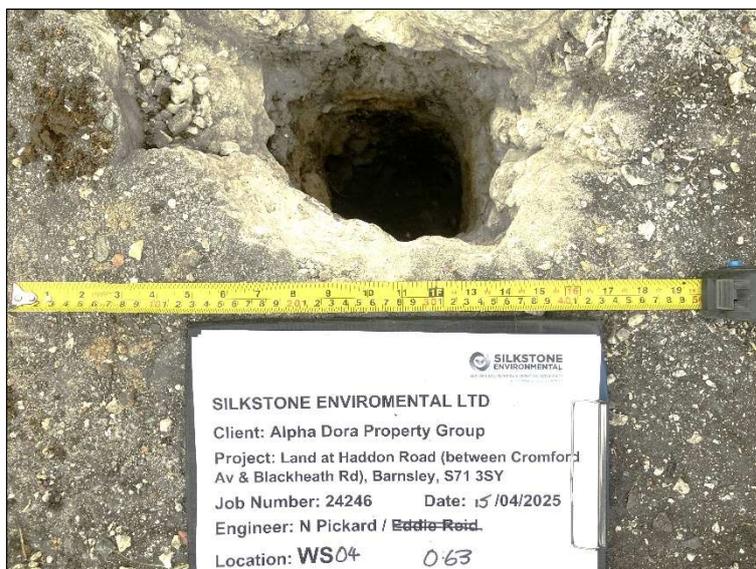


Photo 21: 15/04/2025 WS04 – Hand dug inspection pit.



Photo 22: 15/04/2025 WS04 – Close up of hand dug pit.



Photo 23: 15/04/2025 WS04 – Soils recovered from hand dug pit to 0.63m begl (depth progressing from left to right). Tape is extended to 1.00m.



Photo 24: 15/04/2025 WS04 – Recovered soil cores following penetration by windowless sampling to 1.00m begl and SPT refusal at 1.28m begl (depth progressing left to right). Tape is extended to 1.00m.

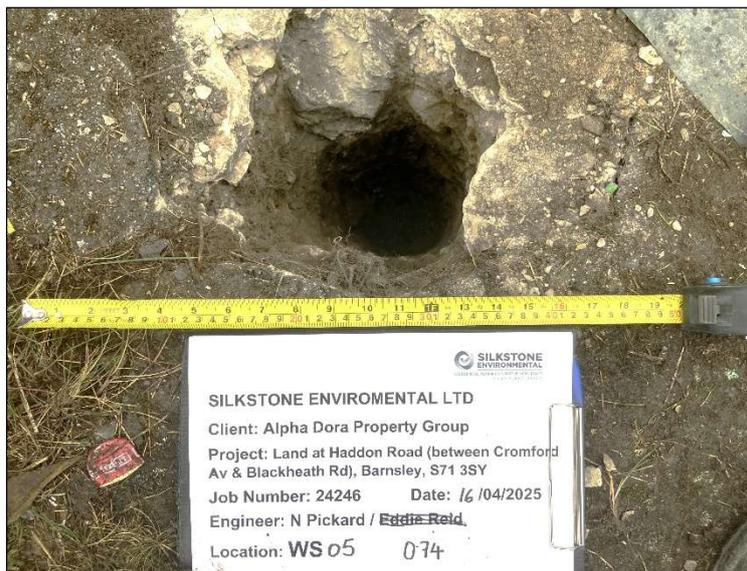


Photo 25: 16/04/2025 WS05 – Hand dug inspection pit.



Photo 26: 16/04/2025 WS05 – Close up of hand dug pit.



Photo 27: 16/04/2025 WS05 – Soils recovered from hand dug pit to 0.74m begl (depth progressing from left to right). Tape is extended to 1.00m.



Photo 28: 16/04/2025 WS05 – Windowless sampling in progress.



Photo 29: 16/04/2025 WS05 – Recovered soil cores following penetration by windowless sampling to 1.80m begl and SPT refusal at 2.19m begl (depth progressing left to right and from top to bottom).

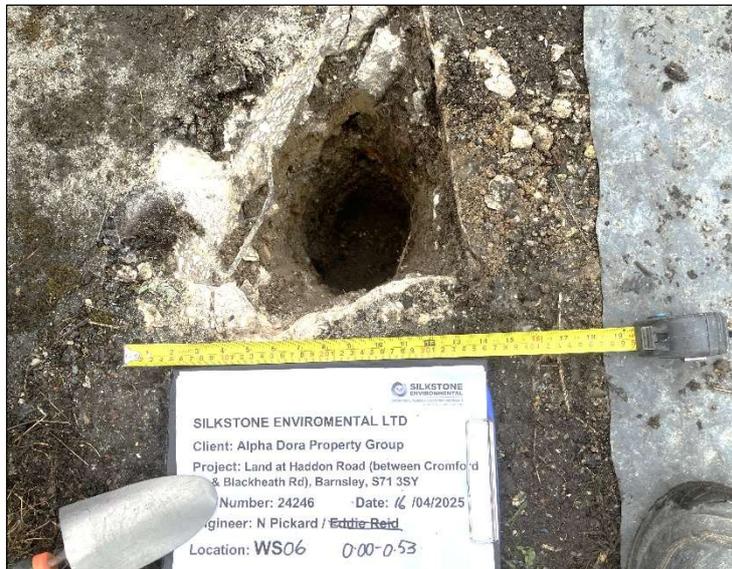


Photo 30: 16/04/2025 WS06 – Hand dug inspection pit.



Photo 31: 16/04/2025 WS06 – Close up of hand dug pit.



Photo 32: 16/04/2025 WS06 – Soils recovered from hand dug pit to 0.53m begl (depth progressing from left to right). Tape is extended to 1.00m.



Photo 33: 16/04/2025 WS06 – Recovered soil cores following penetration by windowless sampling to 1.70m begl and SPT refusal at 2.05m begl (depth progressing left to right and from top to bottom).

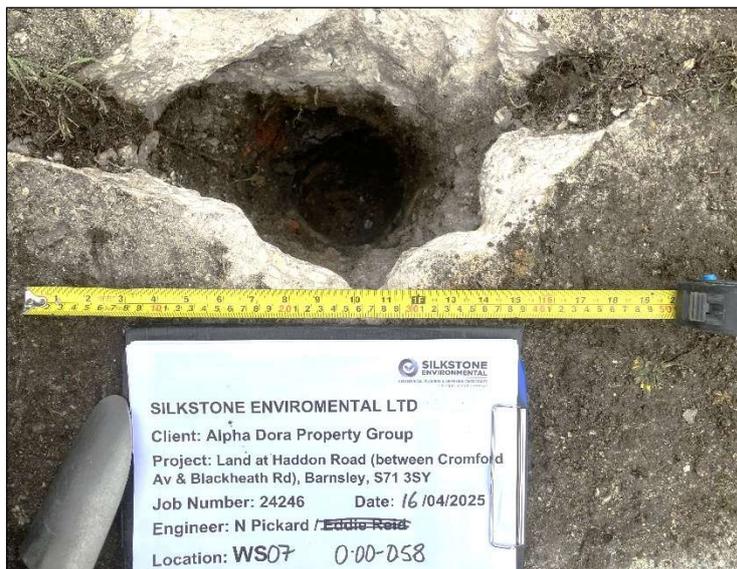


Photo 34: 16/04/2025 WS07 – Hand dug inspection pit.



Photo 35: 16/04/2025 WS07 – Close up of hand dug pit.



Photo 36: 16/04/2025 WS07 – Soils recovered from hand dug pit to 0.58m begl (depth progressing from left to right). Tape is extended to 1.00m.



Photo 37: 16/04/2025 WS07 – Recovered soil cores following penetration by windowless sampling to 1.00m begl (top) and SPT refusal at 1.28m begl (bottom), depth progressing from left to right.

APPENDIX D

Geotechnical Laboratory Testing Results



LABORATORY REPORT



Contract Number: PSL25/3233

Report Date: 22 May 2025
Client's Reference: SEL 24246-02
Client Name: Silkstone Environmental Ltd
7 Hall Annex
Thorncliffe Park
Chapelton
Sheffield
S35 2PH

For the attention of: Nick Pickard

Contract Title: Haddon Road, Athersley South, Barnsley, S71 3SY
Date Received: 30/04/2025
Date Commenced: 30/04/2025
Date Completed: 22/05/2025

Notes: Opinions and Interpretations are outside the UKAS Accreditation

A copy of the Laboratory Schedule of accredited tests as issued by UKAS is attached to this report. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced other than in full, without the prior written approval of the laboratory.

Checked and Approved Signatories:

A Watkins
(Managing Director)

R Berriman
(Associate Director)

S Royle
(Laboratory Manager)

L Knight
(Assistant Laboratory Manager)


D Nicholson
(Senior Technician)

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Page 1 of

PARTICLE SIZE DISTRIBUTION TEST

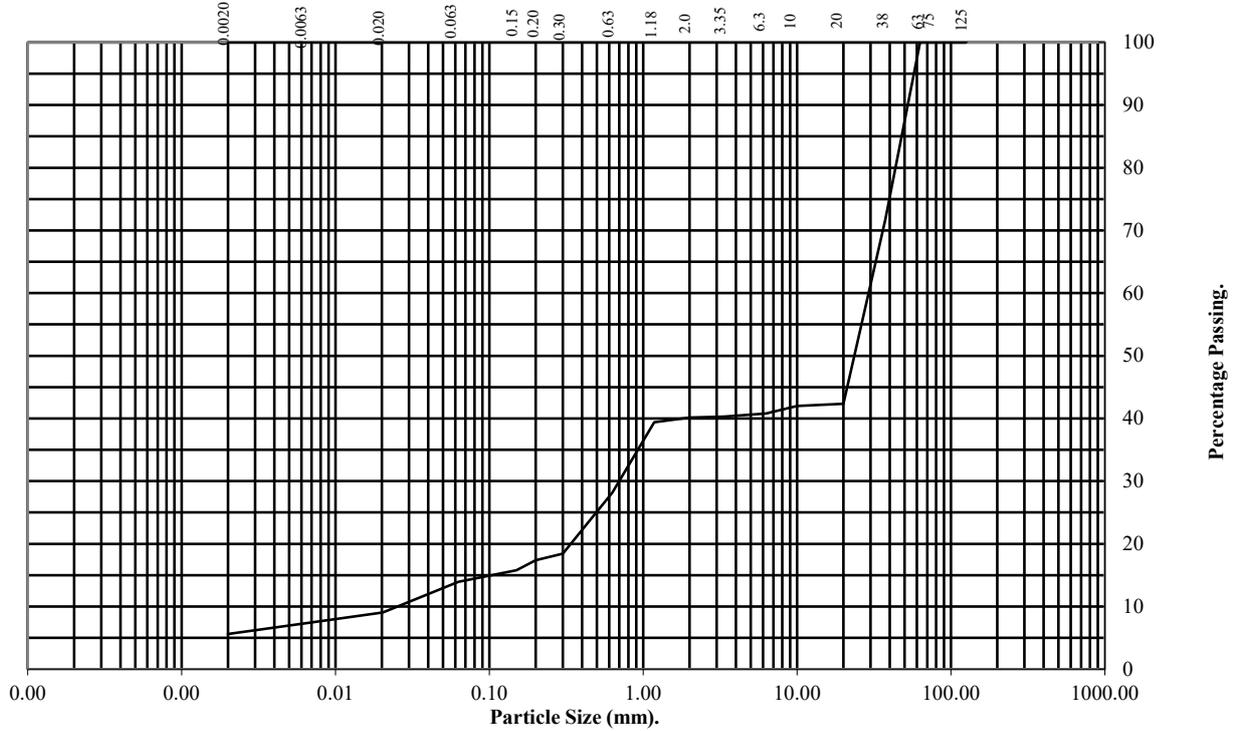
BS 1377 - Part 2 : 2022 : Clause 10 in accordance with BS EN ISO 17892 - 4 : 2016

Sieve Method, Clause 5.2 & Pipette Method, Clause 5.4

Hole Number: **WS01** **Top Depth (m):** **0.63**

Sample Number: **Base Depth (m):** **1.70**

Sample Type: **B**



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	72
20	42
10	42
6.3	41
3.35	40
2	40
1.18	39
0.63	28
0.3	18
0.2	17
0.15	16
0.063	14

Particle Diameter	Percentage Passing
0.020	9
0.0063	7
0.0020	6
<i>Particle Density - 2.65 Mg/m3 assumed</i>	

Soil Fraction	Total Percentage
Cobbles	0
Gravel	60
Sand	26
Silt	8
Clay	6

Remarks:

See Summary of Soil Descriptions



Haddon Road, Athersley South Barnsley, S71 3SY

Contract No:
PSL25/3233
Client Ref:
24246

PARTICLE SIZE DISTRIBUTION TEST

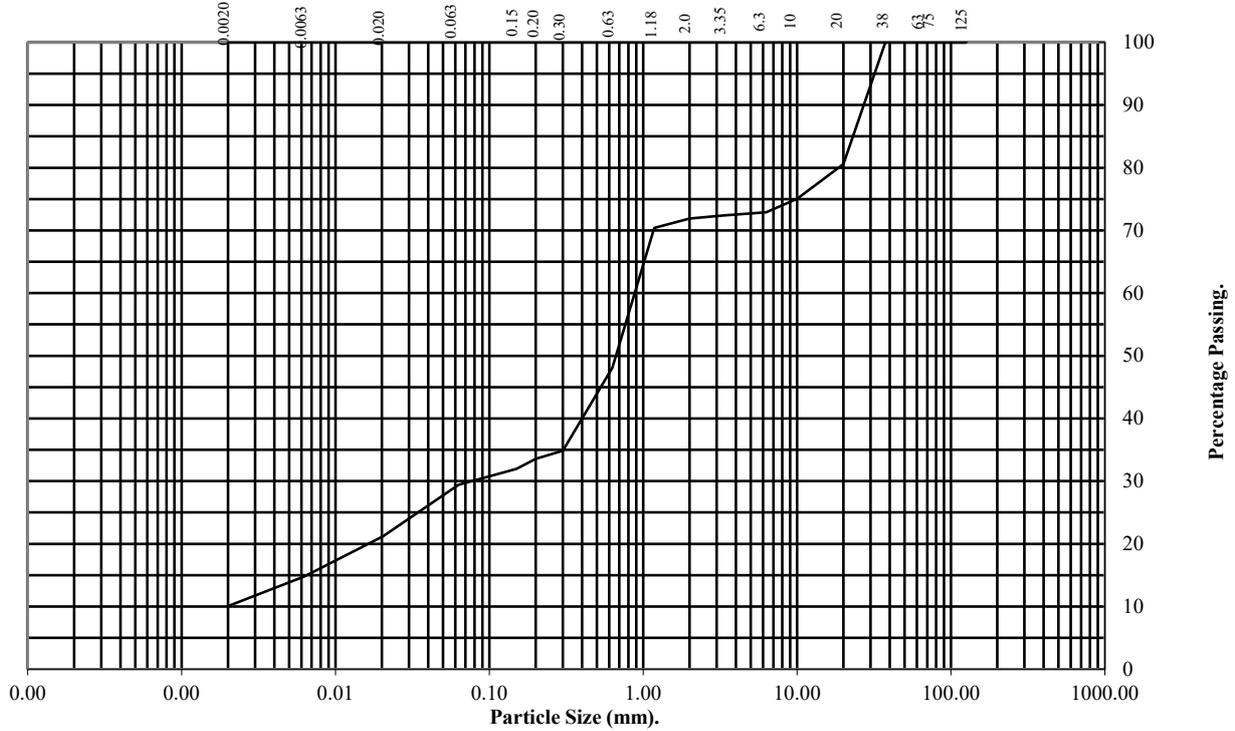
BS 1377 - Part 2 : 2022 : Clause 10 in accordance with BS EN ISO 17892 - 4 : 2016

Sieve Method, Clause 5.2 & Pipette Method, Clause 5.4

Hole Number: **WS05** **Top Depth (m):** **1.10**

Sample Number: **Base Depth (m):** **2.19**

Sample Type: **B**



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	81
10	75
6.3	73
3.35	72
2	72
1.18	70
0.63	48
0.3	35
0.2	34
0.15	32
0.063	29

Particle Diameter	Percentage Passing
0.020	21
0.0063	15
0.0020	10
<i>Particle Density - 2.65 Mg/m3 assumed</i>	

Soil Fraction	Total Percentage
Cobbles	0
Gravel	28
Sand	43
Silt	19
Clay	10

Remarks:

See Summary of Soil Descriptions



Haddon Road, Athersley South Barnsley, S71 3SY

Contract No:
PSL25/3233
Client Ref:
24246

APPENDIX E

Soil Permeability Testing Results

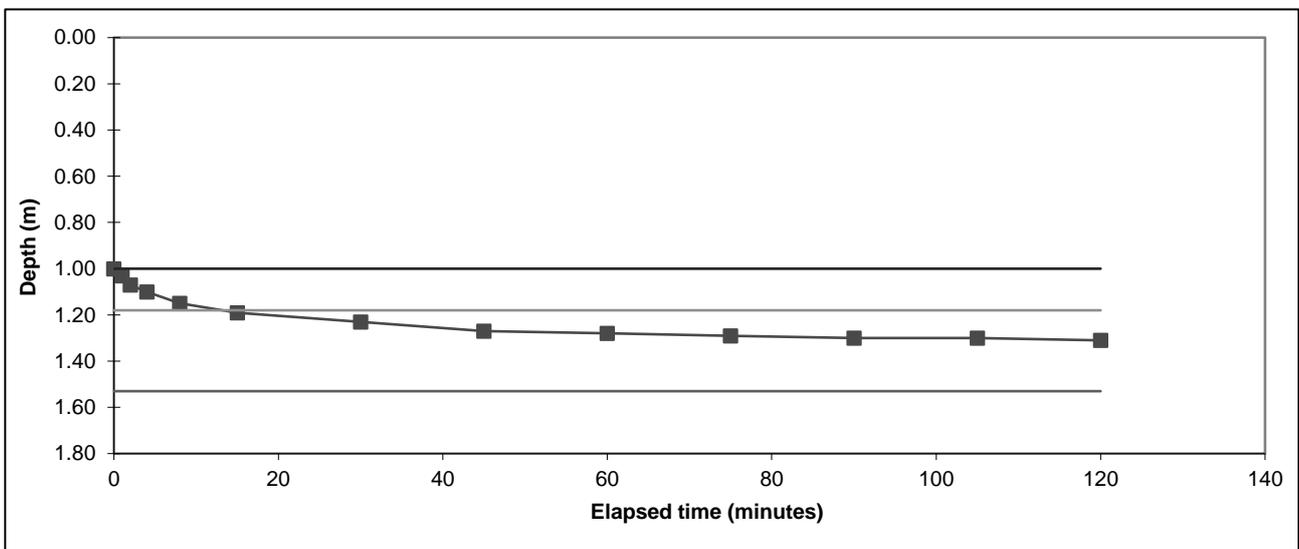
Soakaway Test Report



GEOTECHNICAL, PLANNING & SURVEYING CONSULTANTS
A PHENNA GROUP COMPANY

Trial Pit No:	WS01	Test No:	1	Date:	15/04/2025
Length (m):	0.700	Datum Height:			m agl
Width (m):	0.70	Granular infill:	None		
Depth (m):	1.70	Porosity of infill:	1		(assumed)

Elapsed time (minutes)	Water Depth (m below datum)	Elapsed time (minutes)	Water Depth (m below datum)
0	1.000		
1	1.030		
2	1.070		
4	1.100		
8	1.150		
15	1.190		
30	1.230		
45	1.270		
60	1.280		
75	1.290		
90	1.300		
105	1.300		
120	1.310		



Start water depth for analysis (mbgl):	1.00		
75% effective depth (mbgl):	1.18	Elapsed time (mins):	13.3
50% effective depth (mbgl):	1.35		
25% effective depth (mbgl):	1.53	Elapsed time (mins):	#N/A
Base of soakage zone (mbgl):	1.70		
Volume outflow between 75% and 25% effective depth (m ³):			
Mean surface area of outflow (m ²):			1.47
(side area at 50% effective depth + base area)			
Time for outflow between 75% and 25% effective depth (mins):			

Soil infiltration rate (m/s):	Test incomplete as 25% effective depth not achieved. Unable to reliably determine soil infiltration rate.
--------------------------------------	--

Remarks Results processed following BRE 365 (2007).
Results could not be extrapolated to obtain an infiltration rate due to practically impermeable drainage characteristics.

Client:	Alpha Dora Property Group	Job No:	
Site:	Haddon Road, Ahtersley South, Barnsley, S71 3SY		24246

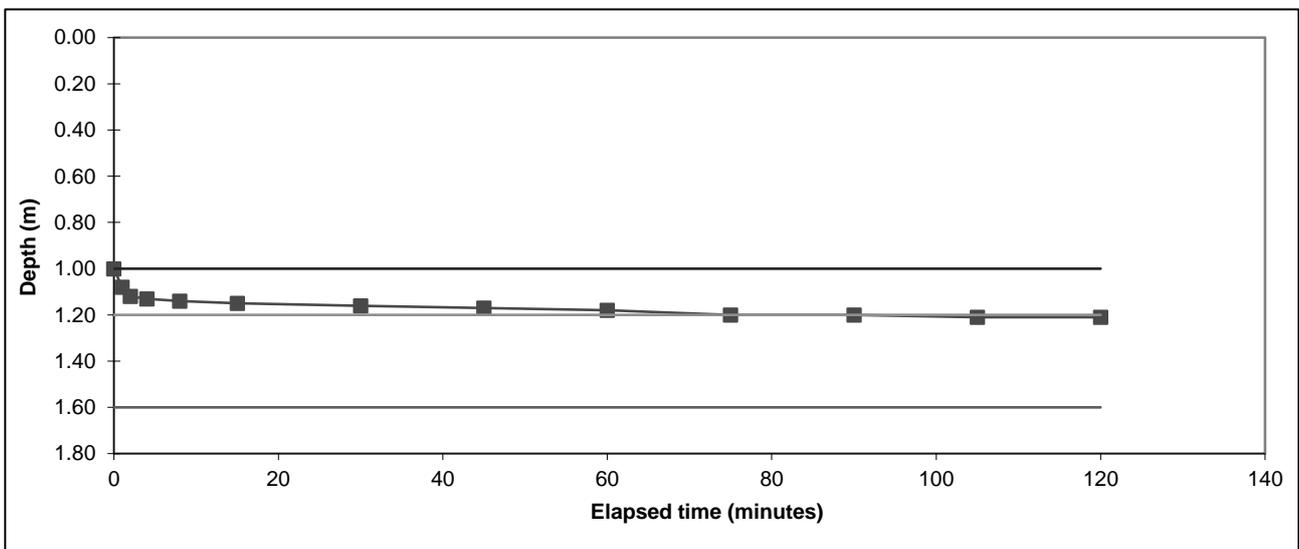
Soakaway Test Report



GEOTECHNICAL, PLANNING & SURVEYING CONSULTANTS
A PHENNA GROUP COMPANY

Trial Pit No:	WS02A	Test No:	1	Date:	15/04/2025
Length (m):	0.700	Datum Height:			m agl
Width (m):	0.70	Granular infill:	None		
Depth (m):	1.80	Porosity of infill:	1		(assumed)

Elapsed time (minutes)	Water Depth (m below datum)	Elapsed time (minutes)	Water Depth (m below datum)
0	1.000		
1	1.080		
2	1.120		
4	1.130		
8	1.140		
15	1.150		
30	1.160		
45	1.170		
60	1.180		
75	1.200		
90	1.200		
105	1.210		
120	1.210		



Start water depth for analysis (mbgl):	1.00	Elapsed time (mins):	90.0
75% effective depth (mbgl):	1.20		
50% effective depth (mbgl):	1.40	Elapsed time (mins):	#N/A
25% effective depth (mbgl):	1.60		
Base of soakage zone (mbgl):	1.80		
Volume outflow between 75% and 25% effective depth (m ³):			
Mean surface area of outflow (m ²):		1.61	
(side area at 50% effective depth + base area)			
Time for outflow between 75% and 25% effective depth (mins):			

Soil infiltration rate (m/s):	Test incomplete as 25% effective depth not achieved. Unable to reliably determine soil infiltration rate.
--------------------------------------	--

Remarks Results processed following BRE 365 (2007).
Results could not be extrapolated to obtain an infiltration rate due to practically impermeable drainage characteristics.

Client:	Alpha Dora Property Group	Job No:	24246
Site:	Haddon Road, Ahtersley South, Barnsley, S71 3SY		

APPENDIX F

Chemical Laboratory Testing Results

Certificate of Analysis

Client: Silkstone Environmental Ltd

Project: 25042799

Quote: BEC250138784 V1.2

Project Ref: 24246

Site: Land at Haddon Rd

Contact: Nick Pickard

Address: 7 Hall Annex
Thornccliffe Park
Chapelton
Sheffield
S35 2PH

E-Mail: Nick.Pickard@silkstoneenvironmental.co.uk

Phone: 0114 2573487

No. Samples Received: 17

Date Received: 22/04/2025

Analysis Completed: 05/05/2025

Date Issued: 06/05/2025

Report Type: Version 01

This report supersedes any versions previously issued by the laboratory



Reported by Customer Service Co-Ordinator
Julie Dickinson
01283 554670
Julie.Dickinson@socotec.co.uk



Project Number: 25042799

Client: Silkstone Environmental Ltd

Date Issued: 06/05/2025

Project Name: 24246 - Land at Haddon Rd

Samples Analysed

<u>Text ID</u>	<u>Sample Reference</u>	<u>Sampling Date</u>	<u>Sample Type</u>	<u>Sample Description</u>
25042799-001	WS01 0.10-0.20	15/04/2025 00:00:00	SOLID	Soil Sample
25042799-002	WS01 0.20-0.40	15/04/2025 00:00:00	SOLID	Silt Sample
25042799-003	WS01 0.53-0.63	15/04/2025 00:00:00	SOLID	Silt Sample
25042799-004	WS02A 0.20-0.29	15/04/2025 00:00:00	SOLID	Silt Sample
25042799-005	WS02A 0.29-0.42	15/04/2025 00:00:00	SOLID	Silt Sample
25042799-006	WS02A 1.60-1.70	15/04/2025 00:00:00	SOLID	Sand Sample
25042799-007	WS03 0.35-0.50	15/04/2025 00:00:00	SOLID	Silt Sample
25042799-008	WS04 0.17-0.37	15/04/2025 00:00:00	SOLID	Silt Sample
25042799-009	WS04 0.37-0.60	15/04/2025 00:00:00	SOLID	Silt Sample
25042799-010	WS04 0.63-0.67	15/04/2025 00:00:00	SOLID	Silt Sample
25042799-011	WS05 0.50-0.60	16/04/2025 00:00:00	SOLID	Silt Sample
25042799-012	WS06 0.13-0.29	16/04/2025 00:00:00	SOLID	Soil Sample
25042799-013	WS06 0.29-0.45	16/04/2025 00:00:00	SOLID	Silt Sample
25042799-014	WS06 1.35-1.45	16/04/2025 00:00:00	SOLID	Sand Sample
25042799-015	WS07 0.28-0.46	16/04/2025 00:00:00	SOLID	Silt Sample
25042799-016	WS07 0.46-0.51	16/04/2025 00:00:00	SOLID	Silt Sample
25042799-017	WS05 & 06 0.11-0.60	16/04/2025 00:00:00	SOLID	Soil Sample



Project Number: 25042799

Client: Silkstone Environmental Ltd
Date Issued: 06/05/2025
Project Name: 24246 - Land at Haddon Rd



Analysis Results

SOCOTEC Sample ID:	25042799-001	25042799-002	25042799-003	25042799-004	25042799-005
Sampling Date:	15/04/2025 00:00	15/04/2025 00:00	15/04/2025 00:00	15/04/2025 00:00	15/04/2025 00:00
Customer ID:	WS01 0.10-0.20	WS01 0.20-0.40	WS01 0.53-0.63	WS02A 0.20-0.29	WS02A 0.29-0.42

Method Code	Analysis	MDL	Accred.					
CLANDPREP	Total Moisture at 35°C	0.1 %	N					
	Major Constituents	-	N		12.3	6.6	10.3	9.5
	Minor Constituents	-	N		SILT	SILT	SILT	SILT
	Miscellaneous Constituents	-	N		Gravel	Gravel	Gravel	Gravel
	Colour of Material	-	N		n/a	n/a	Organic Matter	Made Ground
SUB035	Asbestos Identification	-	N	NAIIS	NAIIS	NAIIS	NAIIS	NAIIS
PHSOIL	pH (2.5:1 extraction)	1 pH units	M ^A		8.0		8.3	8.8
WSLM59	Soil Organic Matter	0.04 % m/m	U ^A		4.37		3.17	2.02
KONENO3	Nitrate as NO3	2 mg/kg	N			3.7		
KONECL	Chloride as Cl	2 mg/kg	N			6		
ICPWSS	Water Soluble Sulphate as SO4 2:1 Ext	10 mg/l	U			31		
ICPWSS	Water Soluble Sulphate as SO4 by Mass	20 mg/kg	M ^A		114		102	429
ICPACIDS	Acid Soluble Sulphate as SO4	20 mg/kg	U			183		
WSLM59	Sulphur as S	0.005 % m/m	N			<0.005		
ICPMSS	Arsenic as As	0.3 mg/kg	M ^A		12.4		6.8	6.9
ICPMSS	Cadmium as Cd	0.2 mg/kg	M ^A		0.3		0.9	0.4
ICPMSS	Total Chromium as Cr	1.2 mg/kg	M ^A		15.2		18.9	11.8
KONENS	Chromium (VI) as Cr	0.1 mg/kg	N ^A		<0.1		<0.1	<0.1
ICPMSS	Copper as Cu	1.6 mg/kg	M ^A		20.1		48.7	28.4
ICPMSS	Lead as Pb	0.7 mg/kg	M ^A		41.4		76.2	31.6
ICPMSS	Mercury as Hg	0.5 mg/kg	M ^A		<0.5		<0.5	<0.5
ICPMSS	Nickel as Ni	2 mg/kg	M ^A		14.0		15.4	11.9
ICPMSS	Selenium as Se	0.5 mg/kg	M ^A		<0.5		<0.5	<0.5
ICPMSS	Zinc as Zn	16 mg/kg	M ^A		52.3		210.2	95.3
ICPWMSG	Magnesium as Mg (2:1 Extract)	0.1 mg/l	N			7.1		
BTEXHSA	MTBE	20 µg/kg	U ^A				<22	
	Benzene (HS_1D_AR)	10 µg/kg	M ^A				<11	
	Toluene (HS_1D_AR)	10 µg/kg	M ^A				<11	
	Ethylbenzene (HS_1D_AR)	10 µg/kg	M ^A				<11	
	m/p-Xylene (HS_1D_AR)	20 µg/kg	M ^A				<22	
GROHSA/BTEXHSA	o-Xylene (HS_1D_AR)	10 µg/kg	M ^A				<11	
	Total GRO C5-C10 (HS_1D_Total)	0.2 mg/kg	M ^A				<0.223	
	C5-C6 Aliphatic (HS_1D_AL)	0.2 mg/kg	M ^A				<0.223	
	>C6-C8 Aliphatic (HS_1D_AL)	0.2 mg/kg	M ^A				<0.223	
	>C8-C10 Aliphatic (HS_1D_AL)	0.2 mg/kg	M ^A				<0.223	
	C5-C7 Aromatic (HS_1D_AR)	0.01 mg/kg	M ^A				<0.011	
	>C7-C8 Aromatic (HS_1D_AR)	0.01 mg/kg	M ^A				<0.011	
TPHFIDUS (Aliphatic)	>C8-C10 Aromatic (HS_1D_AR)	0.04 mg/kg	M ^A				<0.045	
	Total TPH >C8-C40 (Aliphatic) (EH_CU_1D_AL)	20 mg/kg	U ^A				138	
	>C10-C12 (Aliphatic) (EH_CU_1D_AL)	4 mg/kg	U ^A				<4.46	
	>C12-C16 (Aliphatic) (EH_CU_1D_AL)	4 mg/kg	U ^A				8.36	
	>C16-C21 (Aliphatic) (EH_CU_1D_AL)	4 mg/kg	U ^A				8.99	
	>C21-C35 (Aliphatic) (EH_CU_1D_AL)	10 mg/kg	U ^A				91.1	
	>C35-C44 (Aliphatic) (EH_CU_1D_AL)	6 mg/kg	N ^A				35.2	
TPHFIDUS (Aromatic)	Total TPH >C8-C40 (Aromatic) (EH_CU_1D_AR)	20 mg/kg	U ^A				317	
	>C10-C12 (Aromatic) (EH_CU_1D_AR)	4 mg/kg	U ^A				<4.46	
	>C12-C16 (Aromatic) (EH_CU_1D_AR)	4 mg/kg	U ^A				7.52	
	>C16-C21 (Aromatic) (EH_CU_1D_AR)	4 mg/kg	U ^A				29.9	
	>C21-C35 (Aromatic) (EH_CU_1D_AR)	10 mg/kg	U ^A				233	
	>C35-C44 (Aromatic) (EH_CU_1D_AR)	6 mg/kg	N ^A				59.9	
	PAHMSUS	Acenaphthene	0.08 mg/kg	M ^A		2.68		<0.09
Acenaphthylene		0.08 mg/kg	U ^A		0.09		<0.09	<0.09
Anthracene		0.08 mg/kg	U ^A		4.71		0.29	0.10
Benzo[a]anthracene		0.08 mg/kg	M ^A		7.71		1.69	0.62
Benzo[a]pyrene		0.08 mg/kg	M ^A		6.00		1.83	0.66
Benzo[b]fluoranthene		0.08 mg/kg	M ^A		7.35		2.15	0.79
Benzo[g,h,i]perylene		0.08 mg/kg	M ^A		2.56		1.05	0.39
Benzo[k]fluoranthene		0.08 mg/kg	M ^A		2.96		0.90	0.33
Chrysene		0.08 mg/kg	M ^A		6.08		1.51	0.54
Dibenzo[a,h]anthracene		0.08 mg/kg	M ^A		0.64		0.21	<0.09
Fluoranthene		0.08 mg/kg	M ^A		21.0		2.99	1.02
Fluorene		0.08 mg/kg	M ^A		2.38		<0.09	<0.09
Indeno[1,2,3-cd]pyrene		0.08 mg/kg	M ^A		2.98		1.08	0.40
Naphthalene		0.08 mg/kg	M ^A		0.21		0.16	0.11
Phenanthrene		0.08 mg/kg	M ^A		20.6		0.96	0.30
Pyrene		0.08 mg/kg	M ^A		16.3		2.89	1.01
Total PAH 16		1.28 mg/kg	U ^A		104		18.0	6.61



Project Number: 25042799

Client: Silkstone Environmental Ltd
Date Issued: 06/05/2025
Project Name: 24246 - Land at Haddon Rd



Analysis Results

SOCOTEC Sample ID: 25042799-006 25042799-007 25042799-008 25042799-009 25042799-010

Sampling Date: 15/04/2025 00:00 15/04/2025 00:00 15/04/2025 00:00 15/04/2025 00:00 15/04/2025 00:00

Customer ID: WS02A 1.60-1.70 WS03 0.35-0.50 WS04 0.17-0.37 WS04 0.37-0.60 WS04 0.63-0.67

Method Code	Analysis	MDL	Accred.	25042799-006	25042799-007	25042799-008	25042799-009	25042799-010
CLANDPREP	Total Moisture at 35°C	0.1 %	N	10.3	14.3	8.1	14.7	12.4
	Major Constituents	-	N	SAND	SILT	SILT	SILT	SILT
	Minor Constituents	-	N	Clay	Clay	Gravel	Clay	Clay
	Miscellaneous Constituents	-	N	Gravel	Gravel	n/a	Gravel	Gravel
	Colour of Material	-	N	Brown	Brown	Brown	Brown	Brown
SUB035	Asbestos Identification	-	N		NAIIS	NAIIS		
PHSOIL	pH (2.5:1 extraction)	1 pH units	M ^A		7.3	11.4	8.9	
			U	7.9			8.2	
WSLM59	Soil Organic Matter	0.04 % m/m	U ^A		4.29	1.22	4.74	
KONENO3	Nitrate as NO3	2 mg/kg	N	3.8				7.7
KONECL	Chloride as Cl	2 mg/kg	N	8				13
ICPWSS	Water Soluble Sulphate as SO4 2:1 Ext	10 mg/l	U	10				56
	Water Soluble Sulphate as SO4 by Mass	20 mg/kg	M ^A		86	179	407	
ICPACIDS	Acid Soluble Sulphate as SO4	20 mg/kg	U	56				332
WSLM59	Sulphur as S	0.005 % m/m	N	<0.005				0.009
ICPMSS	Arsenic as As	0.3 mg/kg	M ^A		16.2	4.2	12.8	
ICPMSS	Cadmium as Cd	0.2 mg/kg	M ^A		0.2	0.3	0.2	
ICPMSS	Total Chromium as Cr	1.2 mg/kg	M ^A		16.7	11.2	15.7	
KONENS	Chromium (VI) as Cr	0.1 mg/kg	N ^A		<0.1	<0.1	<0.1	
ICPMSS	Copper as Cu	1.6 mg/kg	M ^A		22.1	11.8	21.5	
ICPMSS	Lead as Pb	0.7 mg/kg	M ^A		51.1	19.1	38.5	
ICPMSS	Mercury as Hg	0.5 mg/kg	M ^A		<0.5	<0.5	<0.5	
ICPMSS	Nickel as Ni	2 mg/kg	M ^A		18.3	10.4	14.6	
ICPMSS	Selenium as Se	0.5 mg/kg	M ^A		<0.5	<0.5	<0.5	
ICPMSS	Zinc as Zn	16 mg/kg	M ^A		53.2	55.3	52.3	
ICPWSMG	Magnesium as Mg (2:1 Extract)	0.1 mg/l	N	1.0				6.9
BTEXHSA	MTBE	20 µg/kg	U ^A		<23		<23	
	Benzene (HS_1D_AR)	10 µg/kg	M ^A		<12		<12	
	Toluene (HS_1D_AR)	10 µg/kg	M ^A		<12		<12	
	Ethylbenzene (HS_1D_AR)	10 µg/kg	M ^A		<12		<12	
	m/p-Xylene (HS_1D_AR)	20 µg/kg	M ^A		<23		<23	
GROHSA/BTEXHSA	o-Xylene (HS_1D_AR)	10 µg/kg	M ^A		<12		<12	
	Total GRO C5-C10 (HS_1D_Total)	0.2 mg/kg	M ^A		<0.233		<0.234	
	C5-C6 Aliphatic (HS_1D_AL)	0.2 mg/kg	M ^A		<0.233		<0.234	
	>C6-C8 Aliphatic (HS_1D_AL)	0.2 mg/kg	M ^A		<0.233		<0.234	
	>C8-C10 Aliphatic (HS_1D_AL)	0.2 mg/kg	M ^A		<0.233		<0.234	
	C5-C7 Aromatic (HS_1D_AR)	0.01 mg/kg	M ^A		<0.012		<0.012	
	>C7-C8 Aromatic (HS_1D_AR)	0.01 mg/kg	M ^A		<0.012		<0.012	
TPHFIDUS (Aliphatic)	>C8-C10 Aromatic (HS_1D_AR)	0.04 mg/kg	M ^A		<0.047		<0.047	
	Total TPH >C8-C40 (Aliphatic) (EH_CU_1D_AL)	20 mg/kg	U ^A		37.7		26.2	
	>C10-C12 (Aliphatic) (EH_CU_1D_AL)	4 mg/kg	U ^A		<4.67		<4.69	
	>C12-C16 (Aliphatic) (EH_CU_1D_AL)	4 mg/kg	U ^A		7.45		<4.69	
	>C16-C21 (Aliphatic) (EH_CU_1D_AL)	4 mg/kg	U ^A		6.55		<4.69	
	>C21-C35 (Aliphatic) (EH_CU_1D_AL)	10 mg/kg	U ^A		13.3		12.7	
	>C35-C44 (Aliphatic) (EH_CU_1D_AL)	6 mg/kg	N ^A		11.5		<7.03	
TPHFIDUS (Aromatic)	Total TPH >C8-C40 (Aromatic) (EH_CU_1D_AR)	20 mg/kg	U ^A		34.4		51.1	
	>C10-C12 (Aromatic) (EH_CU_1D_AR)	4 mg/kg	U ^A		<4.67		<4.69	
	>C12-C16 (Aromatic) (EH_CU_1D_AR)	4 mg/kg	U ^A		<4.67		5.32	
	>C16-C21 (Aromatic) (EH_CU_1D_AR)	4 mg/kg	U ^A		6.26		8.26	
	>C21-C35 (Aromatic) (EH_CU_1D_AR)	10 mg/kg	U ^A		19.7		31.2	
PAHMSUS	>C35-C44 (Aromatic) (EH_CU_1D_AR)	6 mg/kg	N ^A		<7.00		<7.03	
	Acenaphthene	0.08 mg/kg	M ^A		<0.09	<0.09	<0.09	
	Acenaphthylene	0.08 mg/kg	U ^A		<0.09	<0.09	<0.09	
	Anthracene	0.08 mg/kg	U ^A		<0.09	<0.09	<0.09	
	Benzo[a]anthracene	0.08 mg/kg	M ^A		0.12	0.19	0.20	
	Benzo[a]pyrene	0.08 mg/kg	M ^A		0.11	0.21	0.21	
	Benzo[b]fluoranthene	0.08 mg/kg	M ^A		0.18	0.28	0.29	
	Benzo[g,h,i]perylene	0.08 mg/kg	M ^A		<0.09	0.13	0.14	
	Benzo[k]fluoranthene	0.08 mg/kg	M ^A		<0.09	0.13	0.13	
	Chrysene	0.08 mg/kg	M ^A		0.15	0.24	0.23	
	Dibenzo[a,h]anthracene	0.08 mg/kg	M ^A		<0.09	<0.09	<0.09	
	Fluoranthene	0.08 mg/kg	M ^A		0.20	0.31	0.37	
	Fluorene	0.08 mg/kg	M ^A		<0.09	<0.09	<0.09	
	Indeno[1,2,3-cd]pyrene	0.08 mg/kg	M ^A		<0.09	0.13	0.14	
	Naphthalene	0.08 mg/kg	M ^A		<0.09	<0.09	<0.09	
	Phenanthrene	0.08 mg/kg	M ^A		0.13	<0.09	0.15	
	Pyrene	0.08 mg/kg	M ^A		0.18	0.34	0.35	
Total PAH 16	1.28 mg/kg	U ^A		1.91	2.55	2.78		



Project Number: 25042799

Client: Silkstone Environmental Ltd
Date Issued: 06/05/2025
Project Name: 24246 - Land at Haddon Rd



Analysis Results

SOCOTEC Sample ID:	25042799-011	25042799-012	25042799-013	25042799-014	25042799-015
Sampling Date:	16/04/2025 00:00	16/04/2025 00:00	16/04/2025 00:00	16/04/2025 00:00	16/04/2025 00:00
Customer ID:	WS05 0.50-0.60	WS06 0.13-0.29	WS06 0.29-0.45	WS06 1.35-1.45	WS07 0.28-0.46

Method Code	Analysis	MDL	Accred.	25042799-011	25042799-012	25042799-013	25042799-014	25042799-015
CLANDPREP	Total Moisture at 35°C	0.1 %	N	11.4		16.1	11.8	13.2
	Major Constituents	-	N	SILT		SILT	SAND	SILT
	Minor Constituents	-	N	Clay		Gravel	Clay	Clay
	Miscellaneous Constituents	-	N	Made Ground		n/a	n/a	Made Ground
	Colour of Material	-	N	Brown		Brown	Brown	Brown
SUB035	Asbestos Identification	-	N	NAIIS	NAIIS	NAIIS		NAIIS
PHSOIL	pH (2.5:1 extraction)	1 pH units	M ^A	8.6		10.7		9.0
WSLM59	Soil Organic Matter	0.04 % m/m	U ^A	3.94		2.71	8.3	2.77
KONENO3	Nitrate as NO3	2 mg/kg	N				3.2	
KONECL	Chloride as Cl	2 mg/kg	N				6	
ICPWSS	Water Soluble Sulphate as SO4 2:1 Ext	10 mg/l	U				<10	
ICPWSS	Water Soluble Sulphate as SO4 by Mass	20 mg/kg	M ^A	238		248		140
ICPACIDS	Acid Soluble Sulphate as SO4	20 mg/kg	U				67	
WSLM59	Sulphur as S	0.005 % m/m	N				<0.005	
ICPMSS	Arsenic as As	0.3 mg/kg	M ^A	11.5		8.1		10.1
ICPMSS	Cadmium as Cd	0.2 mg/kg	M ^A	0.3		0.3		0.4
ICPMSS	Total Chromium as Cr	1.2 mg/kg	M ^A	17.0		13.1		16.8
KONENS	Chromium (VI) as Cr	0.1 mg/kg	N ^A	<0.1		<0.1		<0.1
ICPMSS	Copper as Cu	1.6 mg/kg	M ^A	23.4		17.8		21.6
ICPMSS	Lead as Pb	0.7 mg/kg	M ^A	38.5		50.3		42.2
ICPMSS	Mercury as Hg	0.5 mg/kg	M ^A	<0.5		<0.5		<0.5
ICPMSS	Nickel as Ni	2 mg/kg	M ^A	18.7		14.9		14.8
ICPMSS	Selenium as Se	0.5 mg/kg	M ^A	<0.5		<0.5		<0.5
ICPMSS	Zinc as Zn	16 mg/kg	M ^A	120.1		97.4		127.8
ICPWSMG	Magnesium as Mg (2:1 Extract)	0.1 mg/l	N				4.0	
BTXHSA	MTBE	20 µg/kg	U ^A	<23		<24		<23
	Benzene (HS_1D_AR)	10 µg/kg	M ^A	<11		<12		<12
	Toluene (HS_1D_AR)	10 µg/kg	M ^A	<11		<12		<12
	Ethylbenzene (HS_1D_AR)	10 µg/kg	M ^A	<11		<12		<12
	m/p-Xylene (HS_1D_AR)	20 µg/kg	M ^A	<23		<24		<23
o-Xylene (HS_1D_AR)	10 µg/kg	M ^A	<11		<12		<12	
GROHSA/BTEXHSA	Total GRO C5-C10 (HS_1D_Total)	0.2 mg/kg	M ^A	<0.226		<0.238		<0.230
	C5-C6 Aliphatic (HS_1D_AL)	0.2 mg/kg	M ^A	<0.226		<0.238		<0.230
	>C6-C8 Aliphatic (HS_1D_AL)	0.2 mg/kg	M ^A	<0.226		<0.238		<0.230
	>C8-C10 Aliphatic (HS_1D_AL)	0.2 mg/kg	M ^A	<0.226		<0.238		<0.230
	C5-C7 Aromatic (HS_1D_AR)	0.01 mg/kg	M ^A	<0.011		<0.012		<0.012
	>C7-C8 Aromatic (HS_1D_AR)	0.01 mg/kg	M ^A	<0.011		<0.012		<0.012
	>C8-C10 Aromatic (HS_1D_AR)	0.04 mg/kg	M ^A	<0.045		<0.048		<0.047
TPHFIDUS (Aliphatic)	Total TPH >C8-C40 (Aliphatic) (EH_CU_1D_AL)	20 mg/kg	U ^A	62.6		31.0		40.1
	>C10-C12 (Aliphatic) (EH_CU_1D_AL)	4 mg/kg	U ^A	<4.51		<4.77		<4.61
	>C12-C16 (Aliphatic) (EH_CU_1D_AL)	4 mg/kg	U ^A	<4.51		<4.77		<4.61
	>C16-C21 (Aliphatic) (EH_CU_1D_AL)	4 mg/kg	U ^A	7.41		<4.77		<4.61
	>C21-C35 (Aliphatic) (EH_CU_1D_AL)	10 mg/kg	U ^A	40.8		18.5		31.3
	>C35-C44 (Aliphatic) (EH_CU_1D_AL)	6 mg/kg	N ^A	11.7		<7.15		<6.91
TPHFIDUS (Aromatic)	Total TPH >C8-C40 (Aromatic) (EH_CU_1D_AR)	20 mg/kg	U ^A	103		126		66.3
	>C10-C12 (Aromatic) (EH_CU_1D_AR)	4 mg/kg	U ^A	<4.51		<4.77		<4.61
	>C12-C16 (Aromatic) (EH_CU_1D_AR)	4 mg/kg	U ^A	<4.51		4.97		<4.61
	>C16-C21 (Aromatic) (EH_CU_1D_AR)	4 mg/kg	U ^A	12.3		18.9		7.70
	>C21-C35 (Aromatic) (EH_CU_1D_AR)	10 mg/kg	U ^A	72.1		91.6		44.5
	>C35-C44 (Aromatic) (EH_CU_1D_AR)	6 mg/kg	N ^A	15.2		10.9		9.29
PAHMSUS	Acenaphthene	0.08 mg/kg	M ^A	<0.09		<0.10		<0.09
	Acenaphthylene	0.08 mg/kg	U ^A	<0.09		<0.10		<0.09
	Anthracene	0.08 mg/kg	U ^A	0.17		0.11		<0.09
	Benzo[a]anthracene	0.08 mg/kg	M ^A	0.63		0.37		0.18
	Benzo[a]pyrene	0.08 mg/kg	M ^A	0.62		0.31		0.20
	Benzo[b]fluoranthene	0.08 mg/kg	M ^A	0.85		0.40		0.28
	Benzo[g,h,i]perylene	0.08 mg/kg	M ^A	0.38		0.17		0.14
	Benzo[k]fluoranthene	0.08 mg/kg	M ^A	0.36		0.21		0.13
	Chrysene	0.08 mg/kg	M ^A	0.64		0.36		0.21
	Dibenzo[a,h]anthracene	0.08 mg/kg	M ^A	<0.09		<0.10		<0.09
	Fluoranthene	0.08 mg/kg	M ^A	1.25		0.69		0.34
	Fluorene	0.08 mg/kg	M ^A	<0.09		<0.10		<0.09
	Indeno[1,2,3-cd]pyrene	0.08 mg/kg	M ^A	0.37		0.18		0.13
	Naphthalene	0.08 mg/kg	M ^A	<0.09		0.12		<0.09
	Phenanthrene	0.08 mg/kg	M ^A	0.58		0.32		0.11
	Pyrene	0.08 mg/kg	M ^A	1.10		0.57		0.32
	Total PAH 16	1.28 mg/kg	U ^A	7.39		4.18		2.61



Project Number: 25042799

Client: Silkstone Environmental Ltd
Date Issued: 06/05/2025
Project Name: 24246 - Land at Haddon Rd



Analysis Results

SOCOTEC Sample ID:	25042799-016	25042799-017
Sampling Date:	16/04/2025 00:00	16/04/2025 00:00
Customer ID:	WS07 0.46-0.51	WS05 & 06 0.11-0.60

Method Code	Analysis	MDL	Accred.	25042799-016	25042799-017
CLANDPREP	Total Moisture at 35°C	0.1 %	N	11.8	
	Major Constituents	-	N	SILT	
	Minor Constituents	-	N	Clay	
	Miscellaneous Constituents	-	N	Made Ground	
	Colour of Material	-	N	Brown	
Leachate Prep CEN 10:1	Equivalent Weight of Dry Material (kg)	kg	N		0.090
	Fraction above 4mm (%)	%	N		31.1
	Fraction of non-crushable material (%)	%	N		0
	Volume of Water for 10:1 Leach (ltr)	l	N		0.887
	Weight of Sample Leached (kg)	kg	N		0.103
PHSOIL	pH (2.5:1 extraction)	1 pH units	M ^A	8.0	
WSLM59	Soil Organic Matter	0.04 % m/m	U ^A	2.28	
ICPWSS	Water Soluble Sulphate as SO ₄ by Mass	20 mg/kg	M ^A	162	
ICPMSS	Arsenic as As	0.3 mg/kg	M ^A	8.8	
ICPMSS	Cadmium as Cd	0.2 mg/kg	M ^A	<0.2	
ICPMSS	Total Chromium as Cr	1.2 mg/kg	M ^A	11.0	
KONENS	Chromium (VI) as Cr	0.1 mg/kg	N ^A	<0.1	
ICPMSS	Copper as Cu	1.6 mg/kg	M ^A	13.0	
ICPMSS	Lead as Pb	0.7 mg/kg	M ^A	27.1	
ICPMSS	Mercury as Hg	0.5 mg/kg	M ^A	<0.5	
ICPMSS	Nickel as Ni	2 mg/kg	M ^A	11.5	
ICPMSS	Selenium as Se	0.5 mg/kg	M ^A	<0.5	
ICPMSS	Zinc as Zn	16 mg/kg	M ^A	46.4	
PAHMSUS	Acenaphthene	0.08 mg/kg	M ^A	<0.09	
	Acenaphthylene	0.08 mg/kg	U ^A	<0.09	
	Anthracene	0.08 mg/kg	U ^A	<0.09	
	Benzo[a]anthracene	0.08 mg/kg	M ^A	0.10	
	Benzo[a]pyrene	0.08 mg/kg	M ^A	0.11	
	Benzo[b]fluoranthene	0.08 mg/kg	M ^A	0.15	
	Benzo[g,h,i]perylene	0.08 mg/kg	M ^A	<0.09	
	Benzo[k]fluoranthene	0.08 mg/kg	M ^A	<0.09	
	Chrysene	0.08 mg/kg	M ^A	0.12	
	Dibenzo[a,h]anthracene	0.08 mg/kg	M ^A	<0.09	
	Fluoranthene	0.08 mg/kg	M ^A	0.21	
	Fluorene	0.08 mg/kg	M ^A	<0.09	
	Indeno[1,2,3-cd]pyrene	0.08 mg/kg	M ^A	<0.09	
	Naphthalene	0.08 mg/kg	M ^A	<0.09	
	Phenanthrene	0.08 mg/kg	M ^A	0.12	
	Pyrene	0.08 mg/kg	M ^A	0.18	
	Total PAH 16	1.28 mg/kg	U ^A	1.80	
PHCONDW	pH	1 pH units	N		10.6
PHCONDW	Conductivity at 25°C	100 µS/cm	N		193
PHCONDW	TDS as mg/kg	700 mg/kg	N		1310
	TDS as mg/l	70 mg/l	N		131
TOCW	Leached Organic Carbon	0.4 mg/l	U		9.80
		2 mg/kg	N		97.8
KONENS	Chloride as Cl	1 mg/l	U		6
		10 mg/kg	N		60
ISEF	Fluoride as F	0.1 mg/l	U		0.7
		1 mg/kg	N		7
SFAPI	Phenol Index	0.05 mg/l	U		<0.05
		0.5 mg/kg	N		<0.5
ICPMSW (Dissolved)	Antimony as Sb	0.001 mg/l	U		0.002
		0.01 mg/kg	N		0.02
ICPMSW (Dissolved)	Arsenic as As	0.001 mg/l	U		0.008
		0.01 mg/kg	N		0.08
ICPWATVAR (Dissolved)	Barium as Ba	0.01 mg/l	U		<0.01
		0.1 mg/kg	N		<0.1
ICPMSW (Dissolved)	Cadmium as Cd	0.0002 mg/l	U		0.00002
		0.002 mg/kg	N		<0.0002
ICPMSW (Dissolved)	Total Chromium as Cr	0.001 mg/l	U		0.005
		0.01 mg/kg	N		0.05
ICPMSW (Dissolved)	Copper as Cu	0.001 mg/l	U		0.039
		0.01 mg/kg	N		0.39
ICPMSW (Dissolved)	Lead as Pb	0.0002 mg/l	U		0.0011
		0.01 mg/kg	N		0.01
ICPMSW (Dissolved)	Mercury as Hg	0.00003 mg/l	U		<0.00003
		0.0003 mg/kg	N		<0.0003
ICPMSW (Dissolved)	Molybdenum as Mo	0.001 mg/l	U		0.007
		0.01 mg/kg	N		0.07
ICPMSW (Dissolved)	Nickel as Ni	0.001 mg/l	U		0.002
		0.01 mg/kg	N		0.02
ICPMSW (Dissolved)	Selenium as Se	0.001 mg/l	U		0.002
		0.01 mg/kg	N		0.02
ICPWATVAR (Dissolved)	Total Sulphur as SO ₄	3 mg/l	U		23
		30 mg/kg	N		230
ICPMSW (Dissolved)	Zinc as Zn	0.002 mg/l	U		0.003
		0.02 mg/kg	N		0.03

10:1 Cumulative Amount Leached: 1st Stage Leachate Results:



The Testing Lab PLC
 James Road, Adwick le Street
 Doncaster, DN6 7HH
 TEL: 08001 777 264
 E-mail: info@thetestinglab.eu Web: www.thetestinglab.eu



CERTIFICATE OF ANALYSIS OF ASBESTOS IN SOILS

JOB NO: 134257/1/1

CLIENT DETAILS:	
Client: SOCOTEC UK LIMITED	For the attention of: SOCOTEC Purchasing
Client Address: Socotec House, Bretby Business Park, Ashby Road, Burton-upon-Trent, DE15 0YZ	
Site Address: Socotec	

SAMPLE DETAILS:	
TTL Reference: J309340-25042799 Del 24-04-25-S	No. Samples Reported: 9
Date of Sample Receipt: 24 Apr 2025	Date of Analysis: 29 Apr 2025, 28 Apr 2025
Sample Taken By: Client	

LABORATORY RESULTS:

Aslab ID	Client Sample Reference	Qualitative	Quantitative	Soil Matrix
134257/01	25042799-001	NAD	-	Soil
134257/02	25042799-002	NAD	-	Soil
134257/03	25042799-004	NAD	-	Soil
134257/04	25042799-007	NAD	-	Soil
134257/05	25042799-008	NAD	-	Soil
134257/06	25042799-011	NAD	-	Soil
134257/07	25042799-012	NAD	-	Soil
134257/08	25042799-013	NAD	-	Soil
134257/09	25042799-015	NAD	-	Soil

CONTINUED...

Report Issue Date: 29 April 2025

Key: NAD - No Asbestos Detected in this sample

Method: Samples of materials, referenced as shown above, have been analysed qualitatively and or quantitatively subject to Customer requirements to determine the presence of asbestos fibres. Fibres in the sample were identified using a stereo microscope, polarised light and dispersion staining in accordance with in-house Procedure MQP118 based on Appendix 2 of HSG 248 'Asbestos: The analyst's guide'.
 Disclaimer: Opinions and interpretations, including the description of material type, are outside the scope of our UKAS accreditation. Results apply only to the sample(s) listed in the table above. No responsibility is accepted for errors which may have arisen during sampling or transportation and responsibility cannot be taken for the accuracy, representative nature and location of samples taken by external customers. This test report shall not be reproduced except in full without our prior written approval. Records shall be held securely and electronically for a minimum of 6 years and samples retained for a minimum of 6 months.

Analyst(s): ELLIE WILLIAMS

Analyst Signature(s):



Analyst(s): SARAH GUTTERIDGE

Analyst Signature(s):



Analyst(s): MARTINS ERNSTSONS

Analyst Signature(s):



Analyst(s): CONNOR BAXTER

Analyst Signature(s):



Analyst(s): ALISA EGLITE

Analyst Signature(s):



Approved by: (Approval should be from Laboratory Manager or other authorised personnel)

Name: MARTINS ERNSTSONS

Position: LAB ANALYST

Authorised Signature:





WASTE ACCEPTANCE CRITERIA TESTING (BSEN 12457/2)

Client Name: Silkstone Environmental Ltd
Lab Sample ID: 25042799-017
Sample ID: WS05 & 06 0.11-0.60
Site Name: 24246 - Land at Haddon Rd

Leachate Preparation Data

Weight of Sample (kg)	0.103	Moisture content @ 105°C (%)	12.5
Equivalent weight dried @ 105°C (kg)	0.090	Volume of Water required for 10:1 stage (l)	0.887
Fraction of sample above 4mm (%)	31.1	Fraction of non-crushable material (%)	0

Note: The >4mm fraction is crushed using a disc mill

10:1 Cumulative Leachate Results

Method Code	Analysis	Result	Accred.	Landfill Waste Acceptance Criteria Limit Values		
				Inert Waste Landfill	Stable Non-Reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
PHCONDW	pH (pH units)	10.6	N			
PHCONDW	Conductivity (µS/cm)	193	N			
ICPMSW (Dissolved)	Antimony (mg/kg)	0.02	N	0.06	0.7	5
ICPMSW (Dissolved)	Arsenic (mg/kg)	0.08	N	0.5	2	25
ICPWATVAR (Dissolv	Barium (mg/kg)	<0.1	N	20	100	300
ICPMSW (Dissolved)	Cadmium (mg/kg)	<0.0002	N	0.04	1	5
ICPMSW (Dissolved)	Chromium (mg/kg)	0.05	N	0.5	10	70
ICPMSW (Dissolved)	Copper (mg/kg)	0.39	N	2	50	100
ICPMSW (Dissolved)	Lead (mg/kg)	0.01	N	0.5	10	50
ICPMSW (Dissolved)	Mercury (mg/kg)	<0.0003	N	0.01	0.2	2
ICPMSW (Dissolved)	Molybdenum (mg/kg)	0.07	N	0.5	10	30
ICPMSW (Dissolved)	Nickel (mg/kg)	0.02	N	0.4	10	40
ICPMSW (Dissolved)	Selenium (mg/kg)	0.02	N	0.1	0.5	7
ICPMSW (Dissolved)	Zinc (mg/kg)	0.03	N	4	50	200
KONENS	Chloride (mg/kg)	60	N	800	15000	25000
ISEF	Fluoride (mg/kg)	7	N	10	150	500
ICPWATVAR (Dissolv	Sulphate as SO4 (mg/kg)	230	N	1000	20000	50000
PHCONDW	Total Dissolved Solids (mg/kg)	1310	N	4000	60000	100000
SFAPI	Phenol Index (mg/kg)	<0.5	N	1		
TOCW	Dissolved Organic Carbon (mg/kg)	97.8	N	500	800	1000

Accreditation status of M denotes MCERT, U denotes UKAS, N denotes no accreditation for the specific result
 Landfill Waste Acceptance Criteria limit values are taken from 2003/33/EC: Council Decision and are correct as of 8th January 2024
 Conductivity and pH results are reported from the leached sample, not calculated into the cumulative solid sample



Project Number: 25042799

Client: Silkstone Environmental Ltd
Date Issued: 06/05/2025
Project Name: 24246 - Land at Haddon Rd

Leachate Prep CEN 10:1	WAC Leachate Prep, 1-Stage 10:1 (BSEN 12457-2)	As Received
PAHMSUS	16 PAHs by GCMS	As Received
PHCONDW	Electrical Conductivity @ 25°C	Filtered
PHCONDW	pH	Filtered
PHCONDW	TDS: Total Dissolved Solids (Calc)	Filtered
PHCONDW	Total Dissolved Solids in Solids (BSEN 12457-2)	Filtered
PHSOIL	pH (2.5:1)	As Received
SFAPI	Phenol Index (Total) by SFA	Filtered
SFAPI	Phenol Index in Solids (BSEN 12457-2)	Filtered
SUB020	Asbestos Stage 1: Screen & ID	
SUB035	Asbestos Stage 1: Screen & ID	
TOCW	Leached Organic Carbon in Solids (BSEN 12457-2)	Filtered
TOCW	LOC: Leached Organic Carbon	Filtered
TPHFIDUS (Aliphatic)	TPH (CWG UK) Aliphatic Split with Carbon Banding	As Received
TPHFIDUS (Aromatic)	TPH (CWG UK) Aromatic Split with Carbon Banding	As Received
WSLM59	SOM: Soil Organic Matter (%) (Calc)	Air Dried & Ground
WSLM59	Total Sulphur	Air Dried & Ground

Result Report Notes

Letters alongside results signify that the result has associated report notes. The report notes are as follows:

<u>Letter</u>	<u>Note</u>
A	Due to the matrix of the sample the laboratory has had to deviate from our standard protocols to be able to process the sample and provide a result. Where applicable the accreditation has been removed and this should be taken into consideration when utilising the data.
B	The QC associated with this result has not wholly met the QMS requirements, the accreditation has therefore been removed. However, the Laboratory has confidence in the performance of the method as a whole and that the integrity of the data has not been significantly compromised.
C	Due to matrix interference, the internal standard and/or surrogate has not met the QMS requirements. This should be taken into consideration when utilising the data.
D	A non-standard volume or mass has been used for this test which has resulted in a raised detection limit.
E	Due to the parameter value being beyond our calibration range (and following the maximum size of dilution allowed, where applicable), the result cannot be quantified and as such the result will appear as a greater than symbol (>) with the accreditation removed. This data should be used for indicative purposes only.
F	Based on the sample history, appearance and smell a dilution was applied prior to testing. Unfortunately, the result is either above (>) or below (<) our calibration range. Results above our calibration range have accreditation removed. The data should be used for indicative purposes only.
G	The day 5 oxygen reading was below the capability of the instrument to detect, and therefore the calculated BOD has been reported unaccredited for guidance purposes only.



Project Number: 25042799

Client: Silkstone Environmental Ltd
Date Issued: 06/05/2025
Project Name: 24246 - Land at Haddon Rd

[HWOL Acronym Key](#)

<u>Acronym</u>	<u>Description</u>
HS	Headspace Analysis
EH	Extractable Hydrocarbons - i.e everything extracted by the solvent(s)
CU	Clean up - e.g. by florisil, silica gel
1D	GC - Single coil gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics only
AR	Aromatics only
+	Operator to indicate cumulative e.g. EH_CU+HS_1D_Total

[Additional Information](#)

This report refers to samples as received. SOCOTEC UK Ltd takes no responsibility for accuracy or competence of sampling by others.

Results within this report relate only to the samples tested.

The accreditation codes are as follows:

- U = UKAS accredited analysis
- M = MCERT accredited analysis
- N = Unaccredited analysis

Any accreditation marked with ^ signify results are reported on a dry weight basis of 35° c.

All Air Dried and Ground Samples (ADG) are oven dried at less than 35° c.

This report shall not be reproduced except in full, without written approval of the laboratory.

Opinions and interpretations given are outside the scope of our UKAS accreditation.

Any results marked with * are not covered by our scope of UKAS accreditation. If applicable, further report notes have been added.

Any solid samples where the Major Constituents are not one of the following (Sand, Silt, Clay, Made Ground) are not one of our accredited matrix types.

Any samples marked with a tick in the deviant table is deviant for the specific reason.

Any samples reported as IS, NA, ND mean the following:

- IS = Insufficient Sample to complete analysis
- NA = Sample is not amenable for the required analysis
- ND = Results cannot be determined

Items listed with a 'SUB' method code prefix have been carried out by another SOCOTEC department or by an external subcontracted laboratory. Further information is available upon request.

Our deviating sample report does not include deviancy information for Subcontracted analysis. Please see the report from the subcontracted lab for information regarding any deviancies for this analysis.

Summaries of analysis methods are available upon request.

End of Certificate of Analysis

Certificate of Analysis

Client: Silkstone Environmental Ltd

Project: 25050775

Quote: BEC250138784 V2.1

Project Ref: 24246

Site: Land at Haddon Rd

Contact: Nick Pickard

Address: 7 Hall Annex
Thornccliffe Park
Chapelton
Sheffield
S35 2PH

E-Mail: Nick.Pickard@silkstoneenvironmental.co.uk

Phone: 0114 2573487

No. Samples Received: 1

Date Received: 07/05/2025

Analysis Completed: 22/05/2025

Date Issued: 22/05/2025

Report Type: Version 01

This report supersedes any versions previously issued by the laboratory



Reported by Reporting Officer
Aniko Gondolne-Mantler
01283 554434
Aniko.Gondolne-Mantler@socotec.co.uk



Project Number: 25050775

Client: Silkstone Environmental Ltd
Date Issued: 22/05/2025
Project Name: 24246 - Land at Haddon Rd

Samples Analysed

<u>Text ID</u>	<u>Sample Reference</u>	<u>Sampling Date</u>	<u>Sample Type</u>	<u>Sample Description</u>
25050775-001	WS05 & 06 0.11-0.60	16/04/2025 00:00:00	SOLID	Silt Sample



Project Number: 25050775

Client: Silkstone Environmental Ltd
Date Issued: 22/05/2025
Project Name: 24246 - Land at Haddon Rd



Analysis Results

SOCOTEC Sample ID: 25050775-001
 Sampling Date: 16/04/2025 00:00
 Customer ID: WS05 & 06 0.11-0.6
 MDL: 0
 Accred.:

Method Code	Analysis	MDL	Accred.	
CLANDPREP	Total Moisture at 35°C	0.1 %	N	12.0
	Major Constituents	-	N	SILT
	Minor Constituents	-	N	Roots
	Miscellaneous Constituents	-	N	n/a
	Colour of Material	-	N	Brown
Leachate Prep CEN 10:1	Equivalent Weight of Dry Material (kg)	kg	N	0.090
	Fraction above 4mm (%)	%	N	0
	Fraction of non-crushable material (%)	%	N	0
	Volume of Water for 10:1 Leach (ltr)	l	N	0.887
	Weight of Sample Leached (kg)	kg	N	0.103
PHSOIL	pH (2.5:1 extraction)	1 pH units	M ^A	9.7
ANC	ANC	0.04 mol/kg	N ^A	2.27
LOI(%MM)	LOI @ 450°C	0.2 % m/m	N ^A	3.4
WSLM59	Total Organic Carbon	0.02 % m/m	U ^A	1.39
BTEXHSA	Benzene (HS_ID_AR)	0.01 mg/kg	M ^A	<0.011
	Toluene (HS_ID_AR)	0.01 mg/kg	M ^A	<0.011
	Ethylbenzene (HS_ID_AR)	0.01 mg/kg	M ^A	<0.011
	m/p-Xylene (HS_ID_AR)	0.02 mg/kg	M ^A	<0.023
	o-Xylene (HS_ID_AR)	0.01 mg/kg	M ^A	<0.011
TPHFIDUS (Aliphatic)	Total BTEX (HS_ID_AR)	0.06 mg/kg	M ^A	<0.068
	Total TPH >C8-C40 (Aliphatic) (EH_CU_ID_AL)	20 mg/kg	U ^A	34.4
PAHMSUS	>C10-C40 (Aliphatic) (EH_CU_ID_AL)	20 mg/kg	U ^A	34.3
	Acenaphthene	0.08 mg/kg	M ^A	<0.09
	Acenaphthylene	0.08 mg/kg	U ^A	<0.09
	Anthracene	0.08 mg/kg	U ^A	0.22
	Benzo[a]anthracene	0.08 mg/kg	M ^A	0.47
	Benzo[a]pyrene	0.08 mg/kg	M ^A	0.49
	Benzo[b]fluoranthene	0.08 mg/kg	M ^A	0.60
	Benzo[g,h,i]perylene	0.08 mg/kg	M ^A	0.33
	Benzo[k]fluoranthene	0.08 mg/kg	M ^A	0.27
	Chrysene	0.08 mg/kg	M ^A	0.47
	Coronene	0.08 mg/kg	N ^A	0.12
	Dibenzo[a,h]anthracene	0.08 mg/kg	M ^A	0.11
	Fluoranthene	0.08 mg/kg	M ^A	1.06
	Fluorene	0.08 mg/kg	M ^A	<0.09
	Indeno[1,2,3-cd]pyrene	0.08 mg/kg	M ^A	0.31
	Naphthalene	0.08 mg/kg	M ^A	<0.09* _a
	Phenanthrene	0.08 mg/kg	M ^A	0.65* _a
	Pyrene	0.08 mg/kg	M ^A	0.94
	Total PAH 16	1.28 mg/kg	U ^A	6.29
	Total PAH 17	1.36 mg/kg	N ^A	6.40
PCBECD	PCB 28	0.005 mg/kg	M ^A	<0.006
	PCB 52	0.005 mg/kg	M ^A	<0.006
	PCB 101	0.005 mg/kg	M ^A	<0.006
	PCB 118	0.005 mg/kg	M ^A	<0.006
	PCB 138	0.005 mg/kg	M ^A	<0.006
	PCB 153	0.005 mg/kg	M ^A	<0.006
	PCB 180	0.005 mg/kg	M ^A	<0.006
	Total PCB 7 Congeners	0.035 mg/kg	M ^A	<0.040
PHCONDW	pH	1 pH units	N	10.2
PHCONDW	Conductivity at 25°C	100 µS/cm	N	182
PHCONDW	TDS as mg/kg	700 mg/kg	N	1240
	TDS as mg/l	70 mg/l	N	124
TOCW	Leached Organic Carbon	0.4 mg/l	U	5.93
		2 mg/kg	N	59.2
KONENS	Chloride as Cl	1 mg/l	U	7
		10 mg/kg	N	70
ISEF	Fluoride as F	0.1 mg/l	U	0.5
		1 mg/kg	N	5
SFAPI	Phenol Index	0.05 mg/l	U	<0.05
		0.5 mg/kg	N	<0.5
ICPMSW (Dissolved)	Antimony as Sb	0.001 mg/l	U	0.002
		0.01 mg/kg	N	0.02
ICPMSW (Dissolved)	Arsenic as As	0.001 mg/l	U	0.009
		0.01 mg/kg	N	0.09
ICPWATVAR (Dissolved)	Barium as Ba	0.01 mg/l	U	<0.1
		0.1 mg/kg	N	<0.1
ICPMSW (Dissolved)	Cadmium as Cd	0.00002 mg/l	U	<0.00002
		0.0002 mg/kg	N	<0.0002
ICPMSW (Dissolved)	Total Chromium as Cr	0.001 mg/l	U	0.003
		0.01 mg/kg	N	0.03
ICPMSW (Dissolved)	Copper as Cu	0.001 mg/l	U	0.009
		0.01 mg/kg	N	0.09
ICPMSW (Dissolved)	Lead as Pb	0.0002 mg/l	U	0.0004
		0.01 mg/kg	N	<0.01
ICPMSW (Dissolved)	Mercury as Hg	0.00003 mg/l	U	<0.00003
		0.0003 mg/kg	N	<0.0003
ICPMSW (Dissolved)	Molybdenum as Mo	0.001 mg/l	U	0.006
		0.01 mg/kg	N	0.06



Project Number: 25050775

Client: Silkstone Environmental Ltd
Date Issued: 22/05/2025
Project Name: 24246 - Land at Haddon Rd



Analysis Results

SOCOTEC Sample ID: 25050775-001
 Sampling Date: 16/04/2025 00:00
 Customer ID: WS05 & 06 0.11-0.6
 0

Method Code	Analysis	MDL	Accred.	
ICPMSW (Dissolved)	Nickel as Ni	0.001 mg/l	U	0.001
		0.01 mg/kg	N	<0.01
ICPMSW (Dissolved)	Selenium as Se	0.001 mg/l	U	0.002
		0.01 mg/kg	N	0.02
ICPWATVAR (Dissolved)	Total Sulphur as SO4	3 mg/l	U	24
		30 mg/kg	N	240
ICPMSW (Dissolved)	Zinc as Zn	0.002 mg/l	U	<0.002
		0.02 mg/kg	N	<0.02

10:1 Cumulative Amount Leached: 1st Stage Leachate Results:

Leachate Preparation Data

Weight of Sample (kg)	0.103	Moisture content @ 105°C (%)	12.8
Equivalent weight dried @ 105°C (kg)	0.090	Volume of Water required for 10:1 stage (l)	0.887
Fraction of sample above 4mm (%)	0	Fraction of non-crushable material (%)	0

Note: The >4mm fraction is crushed using a disc mill

Solid Sample Results

Method Code	Analysis	Result	Accred.	Landfill Waste Acceptance Criteria Limit Values		
				Inert Waste Landfill	Stable Non-Reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
WSLM59	Total Organic Carbon (% m/m)	1.39	U	3	5	6
LOI(%MM)	Loss on Ignition (% m/m)	3.4	N			10
BTEXHSA	Sum of BTEX (mg/kg) (HS_1D_AR)	<0.068	M	6		
PCBECD	Sum of 7 Congener PCBs (mg/kg)	<0.040	M	1		
TPHFIDUS (Aliphatic)	>C10-C40 Aliphatic (mg/kg) (EH_CU_1D_AL)	34.3	U	500		
PAHMSUS	Sum of 17 PAHs (mg/kg)	6.40	N	100		
PHSOIL	pH (pH units)	9.7	M		>6	
ANC	Acid Neutralisation Capacity (mol/kg)	2.27	N		To be evaluated	To be evaluated

10:1 Cumulative Leachate Results

Method Code	Analysis	Result	Accred.	Landfill Waste Acceptance Criteria Limit Values		
				Inert Waste Landfill	Stable Non-Reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
PHCONDW	pH (pH units)	10.2	N			
PHCONDW	Conductivity (µS/cm)	182	N			
ICPMSW (Dissolved)	Antimony (mg/kg)	0.02	N	0.06	0.7	5
ICPMSW (Dissolved)	Arsenic (mg/kg)	0.09	N	0.5	2	25
ICPWATVAR (Dissolv)	Barium (mg/kg)	<0.1	N	20	100	300
ICPMSW (Dissolved)	Cadmium (mg/kg)	<0.0002	N	0.04	1	5
ICPMSW (Dissolved)	Chromium (mg/kg)	0.03	N	0.5	10	70
ICPMSW (Dissolved)	Copper (mg/kg)	0.09	N	2	50	100
ICPMSW (Dissolved)	Lead (mg/kg)	<0.01	N	0.5	10	50
ICPMSW (Dissolved)	Mercury (mg/kg)	<0.0003	N	0.01	0.2	2
ICPMSW (Dissolved)	Molybdenum (mg/kg)	0.06	N	0.5	10	30
ICPMSW (Dissolved)	Nickel (mg/kg)	<0.01	N	0.4	10	40
ICPMSW (Dissolved)	Selenium (mg/kg)	0.02	N	0.1	0.5	7
ICPMSW (Dissolved)	Zinc (mg/kg)	<0.02	N	4	50	200
KONENS	Chloride (mg/kg)	70	N	800	15000	25000
ISEF	Fluoride (mg/kg)	5	N	10	150	500
ICPWATVAR (Dissolv)	Sulphate as SO4 (mg/kg)	240	N	1000	20000	50000
PHCONDW	Total Dissolved Solids (mg/kg)	1240	N	4000	60000	100000
SFAPI	Phenol Index (mg/kg)	<0.5	N	1		
TOCW	Dissolved Organic Carbon (mg/kg)	59.2	N	500	800	1000

Accreditation status of M denotes MCERT, U denotes UKAS, N denotes no accreditation for the specific result
 Landfill Waste Acceptance Criteria limit values are taken from 2003/33/EC: Council Decision and are correct as of 8th January 2024
 Conductivity and pH results are reported from the leached sample, not calculated into the cumulative solid sample



Project Number: 25050775

Client: Silkstone Environmental Ltd
Date Issued: 22/05/2025
Project Name: 24246 - Land at Haddon Rd

PHCONDW	TDS: Total Dissolved Solids (Calc)	Filtered
PHCONDW	Total Dissolved Solids in Solids (BSEN 12457-2)	Filtered
PHSOIL	pH (2.5:1)	As Received
SFAPI	Phenol Index (Total) by SFA	Filtered
SFAPI	Phenol Index in Solids (BSEN 12457-2)	Filtered
TOCW	Leached Organic Carbon in Solids (BSEN 12457-2)	Filtered
TOCW	LOC: Leached Organic Carbon	Filtered
TPHFIDUS (Aliphatic)	TPH (>C8-C40) Aliphatic and Carbon Band (>C10-C40)	As Received
WSLM59	TOC: Total Organic Carbon	Air Dried & Ground

Result Report Notes

Letters alongside results signify that the result has associated report notes.
 The report notes are as follows:

<u>Letter</u>	<u>Note</u>
A	Due to the matrix of the sample the laboratory has had to deviate from our standard protocols to be able to process the sample and provide a result. Where applicable the accreditation has been removed and this should be taken into consideration when utilising the data.
B	The QC associated with this result has not wholly met the QMS requirements, the accreditation has therefore been removed. However, the Laboratory has confidence in the performance of the method as a whole and that the integrity of the data has not been significantly compromised.
C	Due to matrix interference, the internal standard and/or surrogate has not met the QMS requirements. This should be taken into consideration when utilising the data.
D	A non-standard volume or mass has been used for this test which has resulted in a raised detection limit.
E	Due to the parameter value being beyond our calibration range (and following the maximum size of dilution allowed, where applicable), the result cannot be quantified and as such the result will appear as a greater than symbol (>) with the accreditation removed. This data should be used for indicative purposes only.
F	Based on the sample history, appearance and smell a dilution was applied prior to testing. Unfortunately, the result is either above (>) or below (<) our calibration range. Results above our calibration range have accreditation removed. The data should be used for indicative purposes only.
G	The day 5 oxygen reading was below the capability of the instrument to detect, and therefore the calculated BOD has been reported unaccredited for guidance purposes only.

HWOL Acronym Key

<u>Acronym</u>	<u>Description</u>
HS	Headspace Analysis
EH	Extractable Hydrocarbons - i.e everything extracted by the solvent(s)
CU	Clean up - e.g. by florisil, silica gel
1D	GC - Single coil gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics only
AR	Aromatics only
+	Operator to indicate cumulative e.g. EH_CU+HS_1D_Total



Project Number: [25050775](#)

Client: Silkstone Environmental Ltd

Date Issued: 22/05/2025

Project Name: 24246 - Land at Haddon Rd

Additional Information

This report refers to samples as received. SOCOTEC UK Ltd takes no responsibility for accuracy or competence of sampling by others.

Results within this report relate only to the samples tested.

The accreditation codes are as follows:

- U = UKAS accredited analysis
- M = MCERT accredited analysis
- N = Unaccredited analysis

Any accreditation marked with ^ signify results are reported on a dry weight basis of 35° c.

All Air Dried and Ground Samples (ADG) are oven dried at less than 35° c.

This report shall not be reproduced except in full, without written approval of the laboratory.

Opinions and interpretations given are outside the scope of our UKAS accreditation.

Any results marked with * are not covered by our scope of UKAS accreditation. If applicable, further report notes have been added.

Any solid samples where the Major Constituents are not one of the following (Sand, Silt, Clay, Made Ground) are not one of our accredited matrix types.

Any samples marked with a tick in the deviant table is deviant for the specific reason.

Any samples reported as IS, NA, ND mean the following:

- IS = Insufficient Sample to complete analysis
- NA = Sample is not amenable for the required analysis
- ND = Results cannot be determined

Items listed with a 'SUB' method code prefix have been carried out by another SOCOTEC department or by an external subcontracted laboratory. Further information is available upon request.

Our deviating sample report does not include deviancy information for Subcontracted analysis. Please see the report from the subcontracted lab for information regarding any deviancies for this analysis.

Summaries of analysis methods are available upon request.

End of Certificate of Analysis

Certificate of Analysis



Client: Silkstone Environmental Ltd, Silkstone Environmental Ltd, 7 Hall Annex, Thorncliffe Park, Sheffield, SOUTH YORKSHIRE, S35 2PH
 Date Received: 28/04/25 Date Reported: 09/05/25

Client Ref: 310696R251455
 Report ID: BBR00030580/v1

Unit	cfu/g	cfu/g	cfu/g	cfu/g	cfu/25g (Subcontracted to ALS)	cfu/25g (Subcontracted to ALS)	cfu/ ALS
Method No	ENV/226	ENV/245	ENV/245	ENV/252			
Level of Detection	10cfu/g	10cfu/g	10cfu/g	10cfu/g			1 cfu/volume
Accreditation	None	None	None	None	None	None	None
Test	Presumptive Faecal Enterococci in Soil	Presumptive E.coli in Soil	Presumptive Coliforms in Soil	Presumptive Staphylococcus aureus in Soil	Clostridium perfringens	Salmonella in Soil	Listeria species (Subcontracted to ALS)
Socotec Ref: BBR00030580-1 Client Ref: N/A							
Site: Land at Haddon Road Matrix: Soil Tested: 28/04/25	Sampled: 15/04/25 00:00 Source: WS02A 0.20-029 Temp: N/A						
	<10	<10	60	<20	80	Not Detected	Not Detected
Socotec Ref: BBR00030580-2 Client Ref: N/A							
Site: Land at Haddon Road Matrix: Soil Tested: 28/04/25	Sampled: 15/04/25 00:00 Source: WS02A 0.42-0.54 Temp: N/A						
	<10	<10	<10	<20	>1500	Not Detected	Not Detected
Socotec Ref: BBR00030580-3 Client Ref: N/A							
Site: Land at Haddon Road Matrix: Soil Tested: 28/04/25	Sampled: 15/04/25 00:00 Source: WS03 0.40-0.45 Temp: N/A						
	<10	<10	<10	<20	10	Not Detected	Not Detected
Socotec Ref: BBR00030580-4 Client Ref: N/A							
Site: Land at Haddon Road Matrix: Soil Tested: 28/04/25	Sampled: 15/04/25 00:00 Source: WS03 0.50-0.60 Temp: N/A						
	<10	<10	<10	<20	<10	Not Detected	Not Detected
Socotec Ref: BBR00030580-5 Client Ref: N/A							
Site: Land at Haddon Road Matrix: Soil Tested: 28/04/25	Sampled: 15/04/25 00:00 Source: WS04 0.37-0.60 Temp: N/A						
	<10	<10	720	<20	220	Not Detected	Not Detected

Authorised by: Katie Hutchinson
 Position: Team Leader

Deviant Code Key Codes denote a deviating sample. As a result the validity of the final test result may have been compromised.

Issuing Laboratory: Environmental North, SOCOTEC UK Ltd Bretby, Bretby Business Park, Ashby Road, Bretby, Burton-upon-Trent, Staffs, DE15 0YZ
 Any additional opinions or interpretations found in this report, are outside the scope of UKAS accreditation. TVC figures over 300 cfu or counts marked by an 'e' are approximate.
 Any temperatures included in the test report are outside the scope of UKAS Accreditation.

Certificate of Analysis



Client: Silkstone Environmental Ltd, Silkstone Environmental Ltd, 7 Hall Annex, Thorncliffe Park, Sheffield, SOUTH YORKSHIRE, S35 2PH
 Date Received: 28/04/25 Date Reported: 09/05/25

Client Ref: 310696R251455
 Report ID: BBR00030580/v1

Unit	cfu/g	cfu/g	cfu/g	cfu/g	cfu/25g (Subcontracted to ALS)	cfu/25g (Subcontracted to ALS)	cfu/ ALS	
Method No	ENV/226	ENV/245	ENV/245	ENV/252				
Level of Detection	10cfu/g	10cfu/g	10cfu/g	10cfu/g			1 cfu/volume	
Accreditation	None	None	None	None	None	None	None	
Test	Presumptive Faecal Enterococci in Soil	Presumptive E.coli in Soil	Presumptive Coliforms in Soil	Presumptive Staphylococcus aureus in Soil	Clostridium perfringens	Salmonella in Soil	Listeria species (Subcontracted to ALS)	
Socotec Ref: BBR00030580-6 Site: Land at Haddon Road Matrix: Soil Tested: 28/04/25	Client Ref: N/A Sampled: 15/04/25 00:00 Source: WS05 0.50-0.60 Temp: N/A	<10	<10	<10	<20	>1500	Not Detected	Not Detected

Authorised by: Katie Hutchinson
 Position: Team Leader

Deviant Code Key Codes denote a deviating sample. As a result the validity of the final test result may have been compromised.

Issuing Laboratory: Environmental North, SOCOTEC UK Ltd Bretby, Bretby Business Park, Ashby Road, Bretby, Burton-upon-Trent, Staffs, DE15 0YZ
 Any additional opinions or interpretations found in this report, are outside the scope of UKAS accreditation. TVC figures over 300 cfu or counts marked by an 'e' are approximate.
 Any temperatures included in the test report are outside the scope of UKAS Accreditation.

APPENDIX G

Soil Contamination Screening Assessment for Human Health

SOCOTEC Ref: 25042799
Project Ref: Land at Haddon Road, Athersley South, Barnsley, S71 3SY
Analytical Test Results - Solid

Soil Contamination Screening Assessment

25042799	Sample Number:			25042799-001	25042799-002	25042799-003	25042799-004	25042799-005	25042799-006	25042799-007	25042799-008	25042799-009	25042799-010	25042799-011	25042799-012	25042799-013	25042799-014	25042799-015	25042799-016
SEL Ltd	Customer Ref:			WS01 0.10-0.20	WS01 0.20-0.40	WS01 0.53-0.63	WS02A 0.20-0.29	WS02A 0.29-0.42	WS02A 1.60-1.70	WS03 0.35-0.50	WS04 0.17-0.37	WS04 0.37-0.60	WS04 0.63-0.67	WS05 0.50-0.60	WS06 0.13-0.29	WS06 0.29-0.45	WS06 1.35-1.45	WS07 0.28-0.46	WS07 0.46-0.51
Land at Haddon Rd	Matrix:			Soil Sample	Soil Sample	Soil Sample	Soil Sample	Soil Sample	Soil Sample	Soil Sample	Soil Sample	Soil Sample	Soil Sample	Soil Sample	Soil Sample	Soil Sample	Soil Sample	Soil Sample	Soil Sample
06/05/2025	Sampling Date:			15/04/2025	15/04/2025	15/04/2025	15/04/2025	15/04/2025	15/04/2025	15/04/2025	15/04/2025	15/04/2025	15/04/2025	16/04/2025	16/04/2025	16/04/2025	16/04/2025	16/04/2025	16/04/2025
Analyte	Units	GAC Residential (with HGP)	Source of GACs																
Total Moisture at 35°C	%				12.3	6.6	10.3	9.5	10.3	14.3	8.1	14.7	12.4	11.4		16.1	11.8	13.2	11.8
Major Constituents	-				SILT	SILT	SILT	SILT	SAND	SILT	SILT	SILT	SILT	SILT		SILT	SAND	SILT	SILT
Minor Constituents	-				Gravel	Gravel	Gravel	Gravel	Clay	Clay	Gravel	Clay	Clay	Clay		Gravel	Clay	Clay	Clay
Nature of Material	-			Made Ground	Made Ground	Natural	Made Ground	Made Ground	Natural	Made Ground	Made Ground	Made Ground	Natural	Made Ground	Made Ground	Made Ground	Natural	Made Ground	Made Ground
Colour of Material	-				Brown	Brown	Brown	Brown	Brown	Brown	Brown	Brown	Brown	Brown		Brown	Brown	Brown	Brown
Equivalent Weight of Dry Material (kg)	kg																		
Fraction above 4mm (%)	%																		
Fraction of non-crushable material (%)	%																		
Volume of Water for 10:1 Leach (l)	l																		
Weight of Sample Leached (kg)	kg																		
Asbestos Identification	-	Presence	N/A	NAD	NAD		NAD			NAD	NAD			NAD	NAD	NAD		NAD	NAD
pH (2.5:1 extraction)	pH units					7.6			7.9				8.2					8.3	
pH (2.5:1 extraction)^	pH units				8		8.3	8.8		7.3	11.4	8.9		8.6		10.7		9	8
Soil Organic Matter^	% m/m				4.37		3.17	2.02		4.29	1.22	4.74		3.94		2.71		2.77	2.28
Nitrate as NO3	mg/kg					3.7			3.8				7.7				3.2		
Chloride as Cl	mg/kg					6			8				13				6		
Water Soluble Sulphate as SO4 2:1 Ext	mg/l					31			10				56				<10		
Water Soluble Sulphate as SO4 by Mass^	mg/kg				114		102	429		86	179	407		238		248		140	162
Acid Soluble Sulphate as SO4	mg/kg					183			56				332					67	
Sulphur as S	% m/m					<0.005			<0.005				0.009					<0.005	
Arsenic as As^	mg/kg	37	DEFRA C4SL 2014		12.4		6.8	6.9		16.2	4.2	12.8		11.5		8.1		10.1	8.8
Cadmium as Cd^	mg/kg	22	DEFRA C4SL 2014		0.3		0.9	0.4		0.2	0.3	0.2		0.3		0.3		0.4	<0.2
Total Chromium as Cr^	mg/kg	910	LQM/CIEH S4UL 2015		15.2		18.9	11.8		16.7	11.2	15.7		17		13.1		16.8	11
Chromium (VI) as Cr^	mg/kg	21	DEFRA C4SL 2014		<0.1		<0.1	<0.1		<0.1	<0.1	<0.1		<0.1		<0.1		<0.1	<0.1
Copper as Cu^	mg/kg	2400	LQM/CIEH S4UL 2015		20.1		48.7	28.4		22.1	11.8	21.5		23.4		17.8		21.6	13
Lead as Pb^	mg/kg	200	DEFRA C4SL 2014		41.4		76.2	31.6		51.1	19.1	38.5		38.5		50.3		42.2	27.1
Mercury as Hg^	mg/kg	40	LQM/CIEH S4UL 2015		<0.5		<0.5	<0.5		<0.5	<0.5	<0.5		<0.5		<0.5		<0.5	<0.5
Nickel as Ni^	mg/kg	130	LQM/CIEH S4UL 2015		14		15.4	11.9		18.3	10.4	14.6		18.7		14.9		14.8	11.5
Selenium as Se^	mg/kg	250	LQM/CIEH S4UL 2015		<0.5		<0.5	<0.5		<0.5	<0.5	<0.5		<0.5		<0.5		<0.5	<0.5
Zinc as Zn^	mg/kg	3700	LQM/CIEH S4UL 2015		52.3		210.2	95.3		53.2	55.3	52.3		120.1		97.4		127.8	46.4
Magnesium as Mg (2:1 Extract)	mg/l					7.1			1				6.9				4		
TPHS (inc. BTEX & MTBE)		2.5% SOM																	
MTBE^	µg/kg	84,000	CL-AIRE GAC 2010				<22			<23		<23		<23		<24		<23	
Benzene^	µg/kg	870	DEFRA C4SL 2014				<11			<12		<12		<11		<12		<12	
Toluene^	µg/kg	290,000	LQM/CIEH S4UL 2015				<11			<12		<12		<11		<12		<12	
Ethylbenzene^	µg/kg	110,000	LQM/CIEH S4UL 2015				<11			<12		<12		<11		<12		<12	
m/p-Xylene^	µg/kg	270,000	LQM/CIEH S4UL 2015				<22			<23		<23		<23		<24		<23	
o-Xylene^	µg/kg	140,000	LQM/CIEH S4UL 2015				<11			<12		<12		<11		<12		<12	
Total GRO C5-C10^	mg/kg						<0.223			<0.233		<0.234		<0.226		<0.238		<0.230	
C5-C6 Aliphatic^	mg/kg	78	LQM/CIEH S4UL 2015				<0.223			<0.233		<0.234		<0.226		<0.238		<0.230	
>C6-C8 Aliphatic^	mg/kg	230	LQM/CIEH S4UL 2015				<0.223			<0.233		<0.234		<0.226		<0.238		<0.230	
>C8-C10 Aliphatic^	mg/kg	65	LQM/CIEH S4UL 2015				<0.223			<0.233		<0.234		<0.226		<0.238		<0.230	
>C10-C12 (Aliphatic)^	mg/kg	330	LQM/CIEH S4UL 2015				<4.46			<4.67		<4.69		<4.51		<4.77		<4.61	
>C12-C16 (Aliphatic)^	mg/kg	2400	LQM/CIEH S4UL 2015				8.36			7.45		<4.69		<4.51		<4.77		<4.61	
>C16-C21 (Aliphatic)^	mg/kg	92,000	LQM/CIEH S4UL 2015				8.99			6.55		<4.69		7.41		<4.77		<4.61	
>C21-C35 (Aliphatic)^	mg/kg	92,000	LQM/CIEH S4UL 2015				91.1			13.3		12.7		40.8		18.5		31.3	
>C35-C44 (Aliphatic)^	mg/kg	92,000	LQM/CIEH S4UL 2015				35.2			11.5		<7.03		11.7		<7.15		<6.91	
Total TPH >C8-C40 (Aliphatic)^	mg/kg						138			37.7		26.2		62.6		31		40.1	
C5-C7 Aromatic^	mg/kg	140	LQM/CIEH S4UL 2015				<0.011			<0.012		<0.012		<0.011		<0.012		<0.012	
>C7-C8 Aromatic^	mg/kg	290	LQM/CIEH S4UL 2015				<0.011			<0.012		<0.012		<0.011		<0.012		<0.012	
>C8-C10 Aromatic^	mg/kg	83	LQM/CIEH S4UL 2015				<0.045			<0.047		<0.047		<0.045		<0.048		<0.047	
>C10-C12 (Aromatic)^	mg/kg	180	LQM/CIEH S4UL 2015				<4.46			<4.67		<4.69		<4.51		<4.77		<4.61	
>C12-C16 (Aromatic)^	mg/kg	330	LQM/CIEH S4UL 2015				7.52			<4.67		5.32		<4.51		4.97		<4.61	
>C16-C21 (Aromatic)^	mg/kg	540	LQM/CIEH S4UL 2015				29.9			6.26		8.26		12.3		18.9		7.7	
>C21-C35 (Aromatic)^	mg/kg	1500	LQM/CIEH S4UL 2015				233			19.7		31.2		72.1		91.6		44.5	
>C35-C44 (Aromatic)^	mg/kg	1500	LQM/CIEH S4UL 2015				59.9			<7.00		<7.03		15.2		10.9		9.29	
Total TPH >C8-C40 (Aromatic)^	mg/kg						317			34.4		51.1		103		126		66.3	
PAHs		2.5% SOM																	
Acenaphthene^	mg/kg	510	LQM/CIEH S4UL 2015		2.68		<0.09	<0.09		<0.09	<0.09	<0.09		<0.09		<0.10		<0.09	<0.09
Acenaphthylene^	mg/kg	420	LQM/CIEH S4UL 2015		0.09		<0.09	<0.09		<0.09	<0.09	<0.09		<0.09		<0.10		<0.09	<0.09
Anthracene^	mg/kg	5400	LQM/CIEH S4UL 2015		4.71		0.29	0.1		<0.09	<0.09	<0.09		0.17		0.11		<0.09	<0.09
Benzo[a]anthracene^	mg/kg	11	LQM/CIEH S4UL 2015		7.71		1.69	0.62		0.12	0.19	0.2		0.63		0.37		0.18	0.1
Benzo[a]pyrene^	mg/kg	5	DEFRA C4SL 2014		6		1.83	0.66		0.11	0.21	0.21		0.62		0.31		0.2	0.11
Benzo[b]fluoranthene^	mg/kg	3.3	LQM/CIEH S4UL 2015		7.35		2.15	0.79		0.18	0.28	0.29		0.85		0.4		0.28	0.15
Benzo[g,h,i]perylene^	mg/kg	340	LQM/CIEH S4UL 2015		2.56		1.05	0.39		<0.09	0.13	0.14		0.38		0.17		0.14	<0.09
Benzo[k]fluoranthene^	mg/kg	93	LQM/CIEH S4UL 2015		2.96		0.9	0.33		<0.09	0.13	0.13		0.36		0.21		0.13	

Nick Pickard

From: Theepa Supikaran <Partheepa.Supikaran@socotec.co.uk>
Sent: 14 May 2025 07:41
To: Nick Pickard
Subject: RE: certificate-BBR00030580-v1 Silkstone Query

CAUTION: This email originated from outside the organisation. If you are unsure of the emails authenticity, do not click on links or open attachments within it and contact the IT support desk for further advice.

Morning Nick,

Please see the below interpretation of the results.

The samples were from an environmental source that is non-sterile and a high bacterial load is expected. Results are taken into consideration as a comparison due to the variation possible between location sources.

Testing showed evidence of a standard bacterial load in the soil. This is not significant but provides a base to compare results to. The number of Coliforms found on all samples was acceptable and low level indication on source WS04 0.37-0.60 and no Escherichia coli, Staphylococcus, Salmonella and Listeria presence was detected. This would indicate a normal reading for organisms from the source of sample. Faecal Enterococci testing shows no presence and indicates there has not been a recent contamination of the soil.

Clostridium is a secondary indicator for faecal contamination and can show past history of the soil. The counts found however are not significant to suggest this is the case. The Clostridium perfringens levels are high in source WS02A 0.42-0.54 and : WS05 0.50-0.60 and indicates the presence of faecal source.

Overall there were counts found for the key indicator organism Clostridium Spp tested and the presence of organisms associated with faecal contamination and the results from the samples suggest the risk of contamination from faecal sources such as sewerage.

Should you require any further assistance please don't hesitate to contact me.

Kind Regards

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