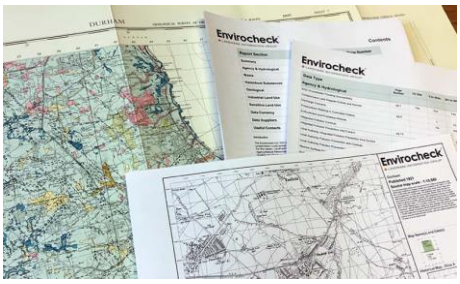
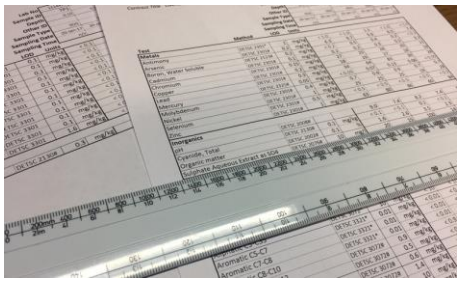
SOLMEK







Phase 2: Site Investigation (Pre-Demolition)

Simonside Arms, South Shields

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ISO 9001:2015 Quality Management
ISO 14001:2015 Environmental Management
ISO 45001 Occupational Health and Safety Management
CHAS Accredited Contractor CHAS.co.uk

PHASE 2 SITE INVESTIGATION REPORT (PRE-DEMOLITION)

SIMONSIDE ARMS, SOUTH SHIELDS

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Revision	Date	Prepared by	Signed
Final	May 2023	A Cutts *Senior Engineering Geologist*	
		Checked by	
		M Atkins *Senior Geotechnical Engineer*	
		Approved by	
		R Woods *Principal Geotechnical Engineer*	

1 EXECUTIVE SUMMARY

Site Address	• Simonside Arms, 97 Newcastle Road, South Shields, NE34 9AA.
Proposed Development	• The proposed development is outlined to be residential comprising dwellings with associated parking, access roads and soft landscaping as gardens. The public house is due for demolition.
Fieldwork	• 5no. small percussive boreholes (BH01 to BH05) drilled to 5.00mbgl. • 3no. ground gas monitoring pipes (BH01, BH03 and BH05). • Sampling, insitu and laboratory testing.
Ground Conditions	• Made ground encountered between 0.60mbgl and 1.20mbgl. The predominant made ground stratum was compacted ashy and clayey gravelly sand mixed with brick, concrete, clinker and natural stone. This was proven beneath tarmacadam surfacing (BH01 & BH02) and from ground surface in the remaining boreholes to depths of 0.40mbgl. • Soft to firm slightly organic clay was encountered beneath the granular deposits in BH01 to BH04 to depths of 0.60mbgl and 0.70mbgl. In BH05 this stratum was absent, however soft to firm slightly sandy slightly gravelly clay with brick and sandstone fragments was proven from 0.40mbgl to 1.20mbgl. • The natural ground consisted of generally soft and firm slightly sandy medium to high strength clay of intermediate to high plasticity over slightly sandy slightly gravelly high strength clay to the termination depth of all boreholes at 5.00mbgl. • Groundwater was not encountered.
Contamination Testing Results	• From the 5no samples subject to testing lead was raised in three samples and PAH in two (coal derived); no other raised levels of metals, semi-metals and non-metals were recorded above the relevant thresholds. • TPHCWG & phenol concentrations were low. • Low sulphates, pH slightly alkaline to highly alkaline. • No asbestos fibres detected in the 5no. samples subject to testing.
Contamination Analysis	• Based on the levels recorded to date, providing shallow materials remain below permanent hardcover or a clean cover system there is a low risk to future end users of the site. • For soft landscaping – a clean cover system should include imported clean topsoil (to a depth of 300mm) over site-won clean natural subsoil to 300mm. • If any zones of odorous, brightly coloured or suspected contaminated ground or groundwater are encountered then work should cease in that area until the material has been investigated. The results of the investigation will therefore determine whether or not remediation will be required. • Full PPE must be incorporated for workers. • Controlled waters unlikely to be at risk. • With respect to utilities, consultation with a utility supplier is recommended, however, pH levels preclude the use of copper pipes and TPHCWG the use of PE pipes. • Sub surface concrete should be designed to DS-1 ACEC (Class AC-1s). • **Further contamination assessment to be undertaken once all buildings are demolished.**
Geotechnical Testing Results	• Cohesive deposits of low to high strength based on laboratory and in-situ testing. • Cohesive materials on site have a **medium** volume change potential. • Moisture contents between 26% and 38%. • Natural stratum, sulphates between 19-33mg/l, pH slightly alkaline.
Geotechnical Analysis & Foundation Recommendations	• A safe bearing capacity of 115kN/m² for strip foundations 0.60m wide founding at 0.90mbgl, locally deepening to 1.40mbgl (BH05). • All deepened sections should be adequately stepped in accordance with NHBC Standards Chapter 4.4. • Excavations should be within the capacity of normal earthworks plant although breaking out of hardstanding surfacing, relict foundations and other obstructions such as natural cobbles and boulders should be anticipated. • Made ground is generally in excess of 600mm and a suspended reinforced ground slab or precast concrete floor should therefore be used.
Further Works	• A series of trial pits will be required once all structures on site have been demolished. The trial pits should be located within the former building footprints to obtain environmental samples and geotechnical samples to aid further contamination and geotechnical assessment. • In addition, it would be prudent to undertake waste classification should the underlying materials be removed from the site.

2 INTRODUCTION

2.1 Authorisation

The site investigation described in this report was carried out by Solmek to the instructions of Origin Planning Services Ltd, on a parcel of land at Simonside Arms, 97 Newcastle Road, South Shields, NE34 9AA. A site location plan is presented in Appendix A, Figure 1.

Sources of information, including previous work undertaken at the site, are detailed below:

- *Solmek Phase 1 Desk Study Report (S230223, February 2023)*

Reference should be made to the above report for details of the site's history and environmental setting.

2.2 Scope of Works

The proposed development is outlined to be residential comprising dwellings with associated parking, access roads and soft landscaping as gardens. The public house is due for demolition.

The following steps may be required in the investigation and remediation of potentially contaminated land:

- Phase 1: Desk Study
- Phase 2: Intrusive Investigation
- Phase 3: Remediation Statement
- Phase 4: Validation Reports

Phases 1 and 2 are generally required in the redevelopment of most sites. Phases 3 and 4 are subject to the findings of the initial stages.

The report represents a pre-demolition geotechnical and environmental (Phase 2) investigation including a ground gas risk assessment. The fieldwork and testing was generally carried out according to:

- BS 5930:2015 Code of Practice for Ground Investigations
- BS 10175:2011+A1:2013 Investigation of Potentially Contaminated Sites – Code of Practice.
- CIRIA C665:2007 Assessing Risks Posed by Hazardous Ground Gas to Buildings
- BS 8485:2015+A1:2019 Code of Practice for the Characterization and Remediation from Ground Gas in Affected Developments
- Rock and soil descriptions shall be in accordance with BS EN ISO 14689-1:2003, BS EN ISO 14688-1:2002 and BS EN ISO 14688-2:2004
- CIRIA C758D Abandoned Mine Workings Manual

This report forms part of a Stage 1 Risk Assessment (Generic Quantitative Risk Assessment) with respect to the Environment Agency's guidance document Environment Agency *Land Contamination Risk Management*, which replaced the now-withdrawn *Contaminated Land Report 11 – Model Procedures for the Management of Land Contamination (2004)*.

The information provided in this report is based on the investigation fieldwork and is subject to the comments and approval of the various regulatory authorities. There may be other conditions prevailing on the site which have not been disclosed by this investigation and which have not been taken into account by this report. Solmek reserve the right to alter conclusions and recommendations should further information be available or provided. Any schematic representation or opinion of the possible configuration of ground conditions between exploratory holes is conjectural and given for guidance only and confirmation of intermediate ground conditions should be considered if deemed necessary.

3 SITE DESCRIPTION AND FIELDWORK

The centre of the site is located at OS Grid Ref 435030, 564450 and covers an area of approximately 0.39Ha. The area is located at Simonside Arms immediately south of Newcastle Road, South Shields, NE34 9AA.

The site is rectangular in shape with a mostly flat and even topography. The site is currently disused and derelict with a large pub (Simonside Arms) located in the centre which has now fallen into disrepair. The former public house is a large brick and stone building which appears to incorporate various asbestos containing materials within its structure (cladding & roofing). This building also appears to have a basement.

A large hardstanding car park lies in the north and south of the site, which continues to around the east and west of the building. The remainder of the site is comprised of a combination of soft grassed landscaping and areas of paving.

Mature deciduous trees were noted across the southern and western portion of the site.

The site perimeter is not secure with access from the north.

The site is surrounded to the east, south and west by residential properties. Newcastle Road (A194) is located beyond the northern boundary of the site.

3.1 Fieldwork

The fieldwork was carried out on 3rd March 2023. The extent of the investigation consisted of:

- 5no. small percussive boreholes (BH01 to BH05 inclusive) drilled to a depth of 5.00m below ground level (bgl).
    - The boreholes were targeted to provide coverage in the area of the proposed building footprints of the residential development to allow foundation design to take place and to provide samples for geotechnical and shallow contamination testing and analysis.
    - Insitu hand shear vanes were undertaken in natural cohesive deposits.

- Installation of ground-gas and groundwater monitoring pipes in three of the small percussive boreholes (BH01, BH03 and BH05).
    - Installations evenly spaced around the site (25-50m distance) to capture potential ground gas from made ground and underlying deposits.

The boreholes were backfilled with bentonite and/or monitoring installations upon completion.

Descriptions of the strata encountered in the boreholes together with details of sampling and groundwater are presented in Appendix B of this report. A plan showing the location of the boreholes can be found in Appendix A (Figure 2).

4 GROUND CONDITIONS

A summary of the ground conditions encountered is given below.

4.1 Made Ground

Made ground was encountered across the site at depths of between 0.60mbgl and 1.20mbgl. Tarmacadam surfacing was proven in BH01 & BH02 to a depth of 0.08mbgl.

The predominant made ground stratum was compacted ashy and clayey gravelly sand mixed with brick, concrete, clinker and natural stone. This was proven beneath the tarmacadam surfacing (BH01 & BH02) and from ground surface in the remaining boreholes to depths of 0.40mbgl.

Soft to firm slightly organic clay with partially decomposed plant matter was encountered beneath the granular deposits in BH01 to BH04 inclusive to depths of between 0.60mbgl and 0.70mbgl. In BH05 this stratum was absent, however soft to firm slightly sandy slightly gravelly clay with brick and sandstone fragments was proven from 0.40mbgl to 1.20mbgl.

4.2 Natural Deposits

The natural superficial deposits were cohesive comprising an upper layer of soft and firm slightly sandy

medium to high strength clay of intermediate to high plasticity. This was locally slightly gravelly in BH02 and of low strength in BH05. The clay was encountered from beneath the made ground to depths of between 1.40mbgl (BH05) and 1.80mbgl (BH04).

A lower layer of slightly sandy slightly gravelly high strength clay was also proven from 1.40mbgl to 1.60mbgl to the termination depth of all boreholes at 5.00mbgl.

The gravel fractions consisted of sandstone, limestone and mudstone.

4.3 Groundwater

Groundwater was not encountered during the fieldwork.

It should be noted the rapid rate of advancement of the exploratory holes may mask minor seepages and it should be borne in mind that water levels fluctuate with a number of influences including season, rainfall, dewatering and pumping activities.

5 CONTAMINATION TESTING RESULTS

The proposed development is outlined to be residential comprising dwellings with associated parking, access roads and soft landscaping as gardens. The public house is due for demolition.

5.1 Site Characterisation

Within the Solmek Phase 1 report an overall low to moderate risk was provided for various receptors. The initial risk was based on the site history which recorded Simonside House from the late 1800's which later became The Simonside Arms public house.

An overall low to moderate risk was provided for various receptors:

- Human Health – Moderate
- Controlled Waters – Moderate to Very Low
- Current Site Users (on-site workers/visitors) – Moderate
- Vegetation – Low
- Construction Materials – Moderate to Low

5.2 Contamination Testing and Rationale

To provide information upon the possibility of ground contamination five samples of made ground were selected for shallow contamination testing. A low to moderate overall contamination risk was highlighted in the Phase 1 report due to current land uses. This coupled with the end use being Residential with Home Grown Produce means that the five samples are considered appropriate for testing. The samples selected are detailed below:

- BH01 – 0.40-0.60m (Made ground – Slightly organic clay)
- BH02 – 0.20-0.40m (Made ground – Ashy clayey gravelly sand)
- BH03 – 0.20-0.40m (Made ground – Ashy gravelly sand)
- BH04 – 0.40-0.60m (Made ground – Slightly organic clay)
- BH05 – 0.80-1.00m (Made ground – Slightly sandy slightly gravelly clay)

The samples selected are considered to provide coverage of the shallow made ground from across the site that would be most likely to be exposed during future site works. Given the lack of groundwater no leachates were undertaken. The samples were tested for the following contaminant suites:

- 5no Metals, semi-metals, non-metals, inorganic determinants
- 5no Asbestos identification screenings
- 5no Speciated Polyaromatic Hydrocarbons (PAHs)
- 5no Total Petroleum Hydrocarbon Criteria Working Group fractions (TPHCWG)

5.3 Test Results

Based on the proposed development at the site, the test results have been compared to a series of Land Quality Management (LQM) Suitable for Use Levels (S4UL) based on a residential with home grown produce land use. These are the most up to date thresholds published in December 2014.

The value for lead has been compared with the Category 4 Screening Level (March 2014) developed by Contaminated Land: Applications In Real Environments (CL:AIRE).

The test results are presented in Appendix C and a summary is provided below in Tables 1 and 2.

TABLE 1: SUMMARY OF INORGANIC CONTAMINATION TESTING RESULTS (RES WITH HGP)

Determinand	Units	Number of Samples above Level of Detection	Minimum Recorded Level	Maximum Recorded Level	Residential with HGP Threshold Value	Number of Results Exceeding Threshold Value
Metals						
Cadmium	mg/kg	5	0.30	0.50	11	0
Chromium	mg/kg	5	19	28	910	0
Copper	mg/kg	5	71	150	2400	0
Lead	mg/kg	5	190	710	200*	3
Mercury	mg/kg	5	0.27	0.78	40	0
Nickel	mg/kg	5	23	38	180	0
Zinc	mg/kg	5	110	280	3700	0
Semi metals and non metals						
Arsenic	mg/kg	5	18	26	37	0
Boron	mg/kg	5	0.20	0.80	290	0
Selenium	mg/kg	1	<0.50	0.80	250	0
Inorganic chemicals						
Cyanide (Total)	mg/kg	5	0.20	0.80	1.49**	0
Sulphate (2:1 Water Soluble)	mg/l	5	15	68	2000^	0
Other						
pH	pH	-	7.5	10.8	5.5^	0

* Category 4 Screening Levels, March 2014
** CLEA Software Version 1.06 (pH7 and 1%SOM)
^ EA Threshold Values
HGP Home Grown Produce

5.4 Metals, Semi Metals and Non-Metals

Elevated concentrations of lead were encountered in the following samples:

- BH03 – 0.20-0.40m (Made ground – Ashy gravelly sand)
- BH04 – 0.40-0.60m (Made ground – Slightly organic clay)
- BH05 – 0.80-1.00m (Made ground – Slightly sandy slightly gravelly clay)

No other samples indicated raised levels of contamination above the S4UL threshold values, based on the five samples tested.

5.5 Inorganic Chemicals

Soluble sulphates (potentially aggressive to foundation concrete) were recorded between 15mg/l and 68mg/l. None of the samples were elevated above levels affecting human health or the BRE Special Digest 1 500mg/l limit for the sulphate classification of concrete.

The results of the pH testing were between 7.5 and 10.8. These pH levels are consistent with slightly alkaline to highly alkaline conditions.

5.6 Organic Chemicals

The organic thresholds vary depending on the levels of soil organic matter (SOM).

The average SOM recorded across the site was 3.96% therefore a SOM of 2.50% has been used to determine the S4UL thresholds. Table 2 below, summarises the results.

TABLE 2: SUMMARY OF ORGANIC CONTAMINATION TESTING RESULTS (RES WITH HGP)

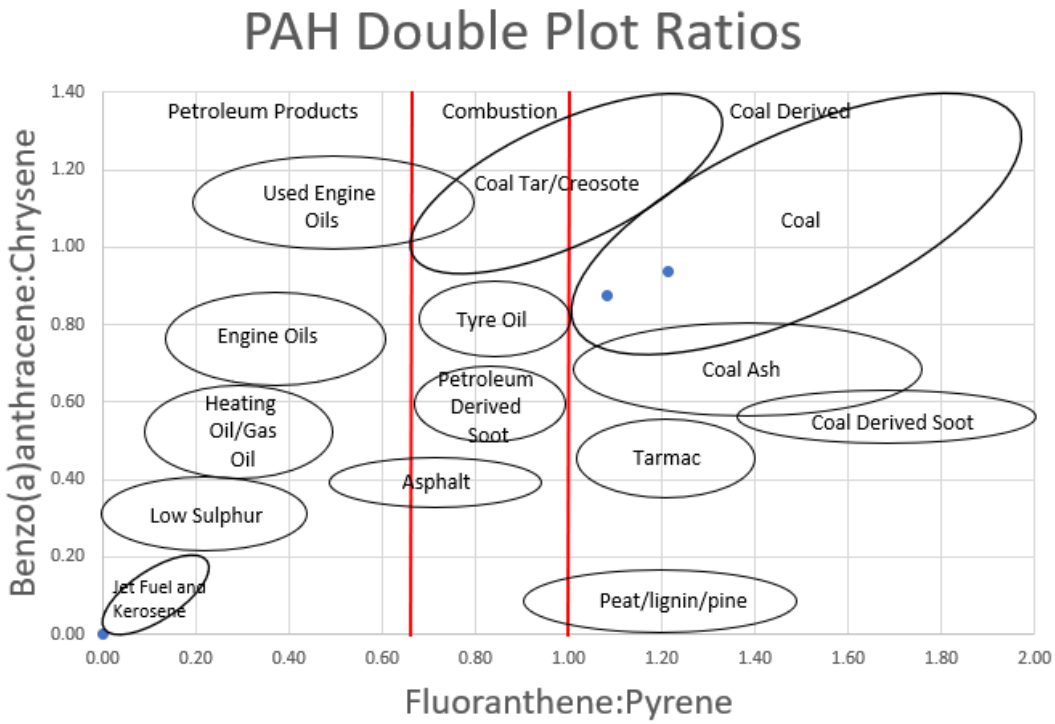
Determinand	Units	Number of Samples above Level of Detection	Minimum Recorded Level	Maximum Recorded Level	Residential with HGP Threshold Value at 2.5% SOM	Number of Results Exceeding Threshold Value
TPH Aliphatic Fractions						
Aliphatic (C5-C6)	mg/kg	0	<0.01	-	78	0
Aliphatic (C6-C8)	mg/kg	0	<0.01	-	230	0
Aliphatic (C8-C10)	mg/kg	0	<0.01	-	65	0
Aliphatic (C10-C12)	mg/kg	2	<1.50	2.33	330	0
Aliphatic (C12-C16)	mg/kg	2	<1.20	2.24	2400	0
Aliphatic (C16-C21)	mg/kg	0	<1.50	-	92000	0
Aliphatic (C21-C35)	mg/kg	5	7.91	12.05	92000	0
TPH Aromatic Fractions						
Aromatic (C5-C7)	mg/kg	0	<0.01	-	140	0
Aromatic (C7-C8)	mg/kg	0	<0.01	-	290	0
Aromatic (C8-C10)	mg/kg	0	<0.01	-	83	0
Aromatic (C10-C12)	mg/kg	0	<0.90	-	180	0
Aromatic (C12-C16)	mg/kg	1	<0.50	1.01	330	0
Aromatic (C16-C21)	mg/kg	5	0.79	22.56	540	0
Aromatic (C21-C35)	mg/kg	3	<1.40	44.85	1500	0
Speciated PAH						
Naphthalene	mg/kg	1	<0.10	0.20	5.6	0
Acenaphthylene	mg/kg	3	<0.10	2.70	420	0
Acenaphthene	mg/kg	2	<0.10	0.70	510	0
Fluorene	mg/kg	2	<0.10	2.70	400	0
Phenanthrene	mg/kg	5	0.20	16	220	0
Anthracene	mg/kg	3	<0.10	8.60	5400	0
Fluoranthene	mg/kg	5	0.60	40	560	0
Pyrene	mg/kg	5	0.60	33	1200	0
Benzo[a]anthracene	mg/kg	5	0.30	30	11	1
Chrysene	mg/kg	5	0.40	32	22	1
Benzo[b]fluoranthene	mg/kg	5	0.30	22	3.3	2
Benzo[k]fluoranthene	mg/kg	5	0.20	13	93	0
Benzo[a]pyrene	mg/kg	5	0.40	27	2.7	2
Benzo[g,h,i]perylene	mg/kg	5	0.30	15	36	0
Dibenz(a,h)Anthracene	mg/kg	5	0.10	4.80	0.28	2
Indeno(1,2,3-c,d)Pyrene	mg/kg	5	0.40	16	340	0
Total PAH	mg/kg	5	4.20	270	50*	2
Total Phenol	mg/kg	3	<0.30	0.40	550	0
* EA Threshold Values						

In terms of TPHCWG all levels were recorded below the relevant thresholds for long term risk to human health. Benzo[b]fluoranthene, Benzo(a)pyrene, Dibenzo(a,h)Anthracene and Total PAH was elevated in the following samples:

- BH02 – 0.20-0.40m (Ashy clayey gravelly sand) also with Benzo[a]anthracene, Chrysene
- BH05 – 0.80-1.00m (Slightly sandy slightly gravelly clay)

All remaining PAH levels were below the relevant thresholds. Double Ratio Plot Analysis of the two samples which recorded elevated PAHs (Figure A, below) indicates that the PAH is of coal origin.

FIGURE A: DOUBLE PLOT RATIOS FOR PAH



5.7 Asbestos

Five samples were selected for asbestos screening. No asbestos fibres were detected.

5.8 Environmental Protection Act 1990: Part 2A Revised Statutory Guidance (April 2012)

This revised document explains how the Local Authority should decide if land, based on a legal interpretation, is contaminated. The document replaces the previous guidance given in Annex 3 of DEFRA Circular 01/2006, issued in accordance with section 78YA of the 1990 Environmental Protection Act.

The main objectives of the Part 2A regime are to "identify and remove unacceptable risks to human health and the environment" and to "seek to ensure that contaminated land is made suitable for its current use". Part 2A uses a risk based approach to defining contaminated land whereby the "risk" is interpreted as "the likelihood that harm, or pollution of water, will occur as a result of contaminants in, on or under the land" and by "the scale and seriousness of such harm or pollution if it did occur".

For a relevant risk to exist a contaminant, pathway and receptor linkage must be present before the land can be considered to be contaminated. The document explains that *"for a risk to exist there must be contaminants present in, on or under the land in a form and quantity that poses a hazard, and one or more pathways by which they might significantly harm people, the environment, or property; or significantly pollute controlled waters."*

A conceptual model is used to develop and communicate the risks associated with a particular site.

To determine if land is contaminated the local authority use various categories from 1 to 4. Categories 1 and 2 include "land which is capable of being determined as contaminated land on grounds of significant possibility of significant harm to human health." Categories 3 and 4 "encompass land which is not capable of being determined on such grounds".

See Appendix E for additional notes on contamination guidelines.

6 CONCEPTUAL MODEL AND CONTAMINATION ANALYSIS

The contamination conceptual model in Table 3 identifies the potential pollution linkages present on site based on source – pathway – receptor relationships.

TABLE 3: CONCEPTUAL MODEL

Source	Pathway	Receptor	Risk Rating	Comments
Asphyxiating or explosive ground gases • Made ground (<1.20m) • Not in Radon Affected Area • Coal Mining Low Risk Area • Organic clays present	**Ground gas migration** • Migration through permeable soils • Inhalation	**Future site users** • Adults and infants	Moderate/Low	Gas monitoring in progress, source risk rating subject to change.
		Users during development • Construction workers	Moderate/Low	
Areas of contamination hazardous to human health (Commercial Thresholds) • 5no. samples tested • 3no. elevated lead • 2no. elevated PAH of coal origin • No asbestos detected	• Inhalation • Dust ingestion • Dermal contact	**Future site users** • Adults and infants	Moderate/Low	Mitigated by proposed structure, hardstanding and clean cover system in proposed garden areas.
		Users during development • Construction workers	Moderate/Low	Mitigation measures required during construction. Consideration to be given to Health and Safety Executive: *Protection of Workers and the General Public During the Development of Contaminated Land.*
	• Inhalation • Dust ingestion	**Users of surrounding sites** • Residents	Low	Potential moderate risk during demolition/remediation/construction from dust generation. Consideration to be given to dust suppression, in line with BRE: *The Control of Dust and Emissions from Construction and Demolition, Best Practice Guidance.*
Areas of elevated Leachate contamination • Not undertaken, no groundwater	• Leaching of mobilised contaminants	**Solid geology** • Secondary A Aquifer	Low	Low sensitivity aquifer considered low risk given lack of shallow groundwater, generally low levels of contaminants and underlying low permeable natural clays.
		Drift geology • Unproductive strata	Low	Low sensitivity aquifer unlikely to be adversely affected.
	• Drainage • Lateral migration • Accumulation of contaminated sediment	**Surface water features** • Pond 5m south west	Low	Low risk given, small feature, generally low levels of determinants at shallow depth and underlying low permeable natural clays.
Areas of phytotoxic contamination • Raised lead	• Uptake via roots and leaf surfaces	**Vegetation** • Soft landscaping as garden areas proposed	Moderate	Clean cover system required for proposed garden areas.
Areas of contamination above service fabric or BRE Special Digest 1 thresholds • Low sulphates • Elevated pH • Elevated TPHCWG	• Direct contact	**Construction Materials** • Concrete	Low	Concrete Class DS-1 ACEC (Class AC-1s).
		Construction Materials • Service Fabric	Moderate	PE & Copper piping to be avoided and prudent to lay any service within a clean bedding.

In general terms construction materials and garden areas are **potentially most** at risk as pollution linkages may be present for each of these receptors. The remaining receptors are considered to be **potentially less** at risk from contamination in the soils on site.

Mitigation measures to reduce the risks identified for reach receptor are discussed in the following sections.

6.1 Users of the Site Once Development is Complete

The users of the site, particularly construction workers, are likely to be exposed to contaminants present in the soils beneath the site during redevelopment work. **Potential** exposure pathways include dermal absorption after contact with contaminated ground, inhalation of soil or dust, inhalation of volatised compounds and inadvertent soil ingestion.

To establish if the levels of contaminants present on site may pose a risk to the health of the future users of the site the results of the contamination testing have been compared to a series of LQM S4UL thresholds based on residential with home grown produce land use (see Tables 1 and 2).

The levels of contaminants across the site are generally low, however, exceedances were recorded in four of the five samples tested, as summarised below:

- BH02 – 0.20-0.40m (Made ground – Ashy clayey gravelly sand) – Benzo[a]anthracene, Chrysene Benzo[b]fluoranthene, Benzo(a)pyrene, Dibenzo(a,h)Anthracene and Total PAH
- BH03 – 0.20-0.40m (Made ground – Ashy gravelly sand) – Lead
- BH04 – 0.40-0.60m (Made ground – Slightly organic clay) – Lead
- BH05 – 0.80-1.00m (Made ground – Slightly sandy slightly gravelly clay) – Lead, Benzo[b]fluoranthene, Benzo(a)pyrene, Dibenzo(a,h)Anthracene and Total PAH

The development is expected to comprise new housing with associated gardens and access roads. Based on the **shallow** soil contamination testing, it is considered that the levels of contamination may pose a risk to future users of the site, as soft landscaping is proposed in the final development. This pollutant linkage however will be severed as long as all contaminated areas are covered either by buildings, hardstanding, or a clean cover system. It would, however, be prudent to undertake a further contamination assessment once the buildings have been removed from site (Section 9).

6.2 Construction Workers and Users of Surrounding Sites

Short term human exposure to contaminants present in soils can occur via several pathways during the construction and ground works phase of the development. These include dermal absorption after contact with contaminated ground, inhalation of soil or dust (including windblown dust), inhalation of volatised compounds, inadvertent soil ingestion and contact with contaminated groundwater.

Raised levels of lead and PAH were detected within the cohesive and granular made ground across the site. It is considered that such levels of contamination may pose a risk to construction workers and users of surrounding sites. As good practice, full PPE must be employed in accordance with Health and Safety Executive*: Protection of Workers and the General Public During the Development of Contaminated Land* and safeguards should be taken to limit dust during ground works, and access to the public should be restricted. Construction workers should use gloves as a precaution when handling any fill materials. Provision of suitable hygiene facilities are needed for site workers.

Although asbestos was not detected from the soil samples subjected to testing within this investigation, the possibility still exists that asbestos containing materials may still be present on site and currently lie undetected. It is therefore advised that a 'watching brief' by an asbestos specialist is undertaken during the demolition of existing buildings, site strip and any excavation works and advice sought if asbestos is found or suspected.

During dry weather, any excavations may require clean water to be sprinkled at shallow depth to prevent excess dust escaping to off-site receptors. Monitoring of dust concentrations during construction should be given careful consideration to ensure occupational exposure levels are not exceeded. Works should be undertaken in line with BRE: *The Control of Dust and Emissions from Construction and Demolition, Best Practice Guidance*.

6.3 Vegetation

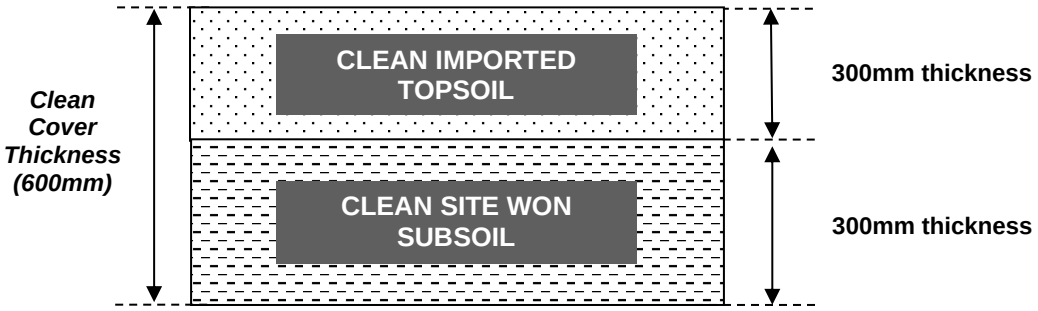
Plants can be affected by soil contamination in a number of ways resulting in growth inhibition, nutrient deficiencies and yellowing of leaves. Contaminants are taken up by plants through the roots and through foliage. Contaminants identified as being highly phytotoxic include boron, cadmium, copper, nickel, and zinc.

To establish if the levels of contaminants present on site may pose a risk to vegetation the results of the contamination testing have been compared to a series of threshold values published in Code of Good Agricultural Practice for the Protection of Soil. Raised concentrations of the phytotoxic determinant lead was detected from the samples tested. In addition, PAH impacted soils were present.

During the initial site strip, proposed soft landscaped areas should be excavated to 0.60mbgl or natural ground (whichever is the shallowest). Any deleterious materials encountered (i.e. ash, brick rubble and concrete) should be removed and placed beneath areas of permanent hardcover. Due to the lack of suitable topsoil this should be imported, however the shallow cohesive natural deposits can be re-used as subsoil.

The cover system should include clean imported topsoil, to a depth of 300mm over clean natural clay subsoil at least 300mm in thickness. The topsoil should be imported from a reputable source. Appropriate certification would be required to ensure that the onsite or imported materials are clean and free from deleterious materials in accordance with the Local Authority Guidelines Verification Requirements for Cover Systems, Technical Guidance for developers, Landowners and Consultants (Yorkshire and Lincolnshire Pollution Advisory Group Version 4.1 – June 2021). Details of the clean cover system must be presented in a Phase 3 Remediation Statement.

The diagram below gives an overview of the minimum thicknesses of clean cover system that should be placed by the site operatives in soft landscaped areas.



6.4 Ground and Surface Water

The principal pathway by which soil contamination may reach the water environment is through a slow seepage or leaching to groundwater or surface water. The potential for contaminants to migrate along such pathways is dependent on the chemical and physical characteristics of the contaminants and the local hydrogeology.

From the site investigation undertaken, ground conditions broadly comprised up to 1.20m of made ground onto natural sandy and gravelly clay deposits.

The Phase 1 report indicates that the bedrock beneath the site is underlain by a Secondary Aquifer – A. The site does not lie within a Source Protection Zone and the status of the overlying superficial deposits are unproductive. Rockhead was not proven. The nearest surface water is a pond to the south west. Groundwater was not encountered.

Based on the soils analysis, there is considered to be a low to moderate level of source contamination within the soils, as most determinants are below relevant thresholds with the exception of elevated lead and PAH contamination.

Given the low to moderate level of source contamination within the soils, the overall contaminant mass present at the site with potential to affect controlled waters is considered to be low. This is further corroborated by the general immobility of PAH in water and lack of groundwater.

This low level of existing contamination, in conjunction with the current hydrogeological setting of the site, would therefore suggest that there is a low risk to controlled waters from existing contamination. Further assessment can be made once all buildings have been removed from the site.

6.5 Construction Materials

Materials at risk from potential soil contamination include inorganic matrices such as cement and concrete and also organic material; e.g. plastics and rubbers. Acid ground conditions and elevated levels of sulphates can accelerate the corrosion of building materials. Plastics and rubbers are generally used for piping and service ducts and are potentially attacked by a range of chemicals, most of which are organic, particularly petroleum-based substances. Drinking water supplies can be tainted by substances that can penetrate piping and water companies enforce stringent threshold values.

6.5.1 Concrete Classification

BRE Special Digest One: *Concrete in Aggressive Ground*: 2005 3rd Edition has been used to assess the risks posed to underground concrete and to establish the design measures required to mitigate the risks. The results of the pH and water-soluble sulphate tests (when converted to total potential sulphate) fall into Class DS-1 ACEC (Class AC-1s) requirements for concrete protection. This assumes static groundwater conditions.

6.5.2 Water Supply Pipes Material Selection

The levels of potential contaminants should be compared to thresholds supplied in the UK Water Industry Research (UKWIR) publication *Guidance for the selection of Water Supply Pipes to be used in Brownfield Sites* (January 2011). A Brownfield Site is defined in the document as “Land or premises that have previously been used or developed that may be vacant or derelict”. It should be noted that Brownfield sites may not be contaminated. The guidance does not apply to Greenfield Sites however water companies may have their own assessment criteria which should be checked by the developer.

Levels of slightly alkaline to alkaline pH (7.5 to 10.8) were recorded across the site at depths of between 0.20mbgl and 1.40mbgl within the made ground and natural ground samples. TPHCWG was locally elevated for water service pipes.

The concentrations of the selected determinants should be compared to the pipe material selection table in Appendix E, and consultation with the appropriate utility supply company is required to identify the most suitable service fabric. However, the pH levels preclude the use of copper pipes and TPHCWG the use of PE pipes.

6.6 Unexpected Contamination

If during the initial site strip or subsequent ongoing construction activities, any zones of odorous, brightly coloured or suspected contaminated ground are encountered, then the following procedure should be followed:

- Stop work in the affected area
- Contact Solmek and provide pictures of the affected area
- Solmek can visit site to investigate the material and provide guidance
- If required – Solmek can sample and test the material
- Once test results are returned, this will determine whether or not remediation will be required

6.7 Waste Classification and WAC Testing

During the site strip and construction activities, material may be required to be removed from site. Any such material would require classification, in line with Environment Agency Technical Guidance *Waste Classification: Guidance on the classification and assessment of waste* (2015). This would classify the material as either Non-Hazardous or Hazardous Waste.

Once the material has been classified, determining the suitable landfill for disposal is governed by landfill directive Waste Acceptance Criteria (WAC) testing, with landfills categorized as Inert Waste, Stable Non-Reactive Hazardous Waste and Hazardous Waste.

If waste classification and/or WAC testing are not undertaken, material taken off site may be subject to WAC testing by the appropriate waste disposal company. The decision on whether or not to accept waste, or whether further testing is required, is at the discretion of the waste disposal company.

7 GROUND GAS ASSESSMENT

The site is expected to be developed with housing, associated parking (hardstanding) and soft landscaped gardens.

Ground gases such as carbon dioxide (CO_2), methane (CH_4), carbon monoxide (CO) and volatile organic compounds (VOCs) can be classed as a form of contamination where there is a potential risk to human health.

For this report, gas monitoring is via measuring emissions from five small percussive boreholes (BH01, BH03 and BH05) that were installed during the sitework. The gas monitoring will consist of six visits over a period of three months. The gas monitoring results will be presented as an addendum to this report.

The rationale of the ground gas installations was to capture ground gas emissions from the made ground across the site.

8 GEOTECHNICAL TESTING AND ANALYSIS

Samples taken from the boreholes underwent a series of geotechnical tests (BS 1377:1990) to aid foundation design and soil description. In addition, insitu hand shear vanes were undertaken at regular intervals during drilling. The geotechnical results are presented in Appendix D.

8.1 Strength and Density

8.1.1 Laboratory Triaxial Tests

Three remoulded U38 samples were subjected to undrained triaxial testing at depths of between 0.80mbgl and 1.40mbgl. The results ranged from 54kPa (medium strength clay) to 81kPa (high strength clay).

8.1.2 Hand Shear Vanes

Hand shear vane testing within the natural cohesive deposits returned results ranging from 23kPa to 76kPa at a depth of 1.20mbgl, these are indicative of low to high strength conditions.

The hand vane results improved below this depth, between 78kPa and 135kPa which are indicative of high strength conditions.

8.2 Moisture Contents

Four samples recovered from the boreholes have been subject to moisture content tests to determine the moisture profile at depths of between 0.80mbgl and 1.40mbgl. Moisture levels were between 26% and 38%.

8.3 Atterberg Limit Determinations

Three Atterberg Limit Determination tests were carried out on samples of cohesive material to classify the fine-grained soils. The results were compared to the Casagrande Chart published in BS 5930 and showed the samples to generally be of intermediate to high plasticity.

The Plasticity Indices ranged from 22 to 31 with equivalent moisture contents recorded above the corresponding plastic limits. The cohesive material can be assessed as having a **medium** shrinkage potential in relation to current guidance.

8.4 pH and Sulphate Results

Three samples of natural soil from the boreholes were tested for acidity and soluble sulphate content to

assess whether the material may be potentially aggressive to building fabric. The results of the testing for pH ranged from 7.8 to 8.0 indicating slightly alkaline conditions. Soluble sulphates were recorded at levels of between 19 and 33mg/l.

8.5 Coal Mining Risk Assessment

The site is within a Coal Mining Reporting Area as defined by the Coal Authority.

From the Coal Mining Report, the shallowest known worked coal seam is the Maudlin seam at 460m depth with a section thickness of 1.90m. In this situation the Maudlin seam is at a sufficient depth to give a ratio well in excess of 10x the seam thickness.

Given the absence of shallow coal seams within influencing distance to the surface, and the site's location outside of a Development High Risk Area, no further investigation into historical coal mining is considered necessary.

8.6 Foundations

8.6.1 Strip Foundations

The site comprises extensive natural clay deposits beneath a layer of made ground up to 1.20m in thickness.

Based on plasticity index results, all cohesive soils at the site should be regarded as being of **medium** volume change potential. Foundations should therefore be placed at a minimum depth of 0.90m below original or finished ground level, whichever is the lower. However, foundations should be deepened around BH05, given the deeper made ground and low strength natural clay in this area, to depths of around 1.40mbgl.

Based on the average shear strength around the minimum foundation depth (50kN/m²) a safe bearing capacity of 115kN/m² has been determined for strip foundations 0.60m wide founding on the natural clay at depths of between 0.90mbgl and 1.40mbgl.

Providing the safe bearing capacity is not exceed settlements have been calculated to be less than 25mm.

All deepened sections should be adequately stepped, in accordance with NHBC Standards Chapter 4.4.

Foundations near existing or proposed trees should also be deepened and provided with appropriate heave precautions in accordance with current guidance.

It should be recognised that clay rich soils can deteriorate fairly rapidly on exposure, particularly in periods of wet weather and frost. It would be prudent to protect all exposed soils in foundation excavations with a concrete blinding layer, particularly if they are likely to remain open for extended periods of time.

Prior to placing foundation concrete, obvious soft or loose spots should be removed and replaced with suitably recompacted hardcore or lean mix concrete.

Sub-surface concrete should be Design Sulphate Class DS-1, with the site allocated an ACEC Classification of AC-1s, assuming static groundwater conditions.

Further advice should be sought from Solmek if unexpected ground conditions are encountered during redevelopment.

8.7 Excavation

Based on the nature of the ground conditions encountered, excavations should be within the capacity of normal earthworks plant although breaking out of surface hardstanding, relict foundations, possible basements from the public house and other obstructions such as natural cobbles and boulders should be anticipated.

Stability of excavations will be poor to moderate in the made ground but should improve in the natural cohesive deposits. Excavation sides should be designed, constructed and supported in accordance with the

recommendations given in CIRIA Report No. 97: “Trenching Practice”.

8.9 Floor Slabs

Made ground is generally in excess of 600mm and a suspended reinforced ground slab or precast concrete floor should therefore be used. However, if the made ground was removed from beneath the footprint of the building and a blanket of compacted inert granular fill was placed in accordance with an engineering specification, ground bearing slabs may be possible, if applicable.

8.10 Groundwater

Groundwater was not encountered during the fieldwork.

It should be noted the rapid rate of advancement of the exploratory holes may mask minor seepages and it should be borne in mind that water levels fluctuate with a number of influences including season, rainfall, dewatering and pumping activities.

9 FURTHER WORKS

A series of trial pits will be required once all structures on site have been demolished. The trial pits should be located within the former building footprints to obtain environmental samples and geotechnical samples for further contamination and geotechnical assessment.

In addition, it would be prudent to undertake waste classification should the underlying materials be removed from the site.

SOLMEK

APPENDIX A



SOLMEK

12-16 Yarm Road, Stockton on Tees, TS18 3NA
Tel: 01642 607083 Email: info@solmek.com

Figure Title

Site Location Plan

Project Number

S230223

Project Name

Simonside Arms, South Shields

Client

Origin Planning Services Ltd

Date

April 2023

DRG Number

Figure 1

Scale

1:5000 @ A4 [DO NOT SCALE]

Legend Key

Project Bounds - Project Bounds



SOLMEK

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Tel: 01642 607083 Email: info@solmek.com

Figure Title

BH Location Plan

Project Number

S230223

Project Name

Simonside Arms, South Shields

Client

Origin Planning Services Ltd

Date

April 2023

DRG Number

Figure 2

Scale

1:750 @ A4 [DO NOT SCALE]

Legend Key

Locations By Type - BH

Project Bounds - Project Bounds

APPENDIX B

SOLMEK
12-16 Yarm Road
Stockton on Tees
TS18 3NA
01642 607083
info@solmek.com

Borehole Log

Scale 1:50 Sheet 1 of 1

BH01

Contract no:	S230223	**Site:**	Simonside Arms, South Shields	**Driller:**	SR Drilling Ltd
				Plant used:	Mini Rig
				Started:	03/03/2023
Client:	Origin Planning Services Ltd			**Ended:**	03/03/2023
Method:	Small Percussive			**Backfilled:**	03/03/2023

GL (AOD):
Easting: 435024
Northing: 564489
Logged: AC
Status: FINAL

Backfill / Installation	Legend	Depth (m)	Level (m AOD)	Stratum Description	Samples and Insitu Testing		
					Depth (m)	Type	Results
		0.08		MADE GROUND: Tarmacadam.			
				MADE GROUND: Black ashy gravelly sand. Sand is fine to coarse. Gravel is angular to subangular fine to coarse of brick, clinker, concrete and sandstone.	0.20 - 0.40	B+ES	
		0.40			0.40 - 0.60	B+ES	
		0.60		MADE GROUND: Soft to firm grey to dark brownish grey slightly organic clay. Rare pieces of partially decomposed plant material noted.			
				Firm light brown mottled orangish brown and grey slightly sandy medium to high strength CLAY of intermediate plasticity. Sand is fine to coarse.	0.80 - 1.00	B+ES	
					1.20	HV	76kPa
					1.40 - 1.60	D	
		1.60		Stiff brown to greyish brown slightly sandy slightly gravelly high strength CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of sandstone, limestone and mudstone.	1.80 - 2.00	D	
					2.00	HV	111kPa
G					2.80 - 3.00	D	
					3.00	HV	114kPa
					3.80 - 4.00	D	
					4.00	HV	135kPa
					4.80 - 5.00	D	
		5.00		End of Borehole at 5.000m	5.00	HV	103kPa

Hole Diameter		Casing Depths		General Remarks	Chiselling			Ground Water				
Depth Base (m)	Diameter (mm)	Depth Base (m)	Diameter (mm)		From (m)	To (m)	Time (hr)	Depth Strike (m)	Depth Casing (m)	Depth Sealed (m)	Time Elapsed (min)	Water Level (m)
				1.2m Hand excavated inspection pit dug. No groundwater encountered. Gas standpipe installed on completion.								

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Stockton on Tees
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Borehole Log

Scale 1:50 Sheet 1 of 1

BH02

Contract no:	S230223	**Site:**	Simonside Arms, South Shields	**Driller:**	SR Drilling Ltd
				Plant used:	Mini Rig
				Started:	03/03/2023
Client:	Origin Planning Services Ltd			**Ended:**	03/03/2023
Method:	Small Percussive			**Backfilled:**	03/03/2023

GL (AOD):	
Easting:	435010
Northing:	564479
Logged:	AC
Status:	FINAL

Backfill / Installation	Legend	Depth (m)	Level (m AOD)	Stratum Description	Samples and Insitu Testing		
					Depth (m)	Type	Results
		0.08		MADE GROUND: Tarmacadam.			
				MADE GROUND: Reddish brown ashy slightly clayey gravelly sand. Sand is fine to coarse. Gravel is angular to subangular fine to coarse of brick, clinker, concrete and sandstone.	0.20 - 0.40	B+ES	
		0.40			0.40 - 0.60	B+ES	
				MADE GROUND: Soft to firm grey to dark brownish grey slightly organic clay. Rare pieces of partially decomposed plant material noted.			
		0.70		Firm light brown mottled orangish brown and grey slightly sandy slightly gravelly medium strength CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of sandstone, limestone and mudstone.	0.80 - 1.00	B+ES	
					1.20	HV	56kPa
					1.40 - 1.60	D	
		1.60		Stiff brown to greyish brown slightly sandy slightly gravelly high strength CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of sandstone, limestone and mudstone.	1.80 - 2.00	D	
					2.00	HV	93kPa
					2.80 - 3.00	D	
					3.00	HV	103kPa
					3.80 - 4.00	D	
					4.00	HV	112kPa
					4.80 - 5.00	D	
		5.00		End of Borehole at 5.000m	5.00	HV	114kPa

Hole Diameter		Casing Depths		General Remarks	Chiselling			Ground Water				
Depth Base (m)	Diameter (mm)	Depth Base (m)	Diameter (mm)		From (m)	To (m)	Time (hr)	Depth Strike (m)	Depth Casing (m)	Depth Sealed (m)	Time Elapsed (min)	Water Level (m)
				1.2m Hand excavated inspection pit dug. No groundwater encountered. Borehole backfilled on completion.								

SOLMEK
12-16 Yarm Road
Stockton on Tees
TS18 3NA
01642 607083
info@solmek.com

Borehole Log

Scale 1:50 Sheet 1 of 1

BH03

Contract no:	S230223	**Site:**	Simonside Arms, South Shields	**Driller:**	SR Drilling Ltd
				Plant used:	Mini Rig
				Started:	03/03/2023
Client:	Origin Planning Services Ltd			**Ended:**	03/03/2023
Method:	Small Percussive			**Backfilled:**	03/03/2023

GL (AOD):
Easting: 435042
Northing: 564448
Logged: AC
Status: FINAL

Backfill / Installation	Legend	Depth (m)	Level (m AOD)	Stratum Description	Samples and Insitu Testing		
					Depth (m)	Type	Results
				MADE GROUND: Black to dark reddish brown ashy gravelly sand. Sand is fine to coarse. Gravel is angular to subangular fine to coarse of brick, clinker, concrete and sandstone.	0.20 - 0.40	B+ES	
		0.40		MADE GROUND: Soft to firm grey to dark brownish grey slightly organic clay. Rare pieces of partially decomposed plant material noted.	0.40 - 0.60	B+ES	
		0.60		Firm light brown mottled orangish brown and grey slightly sandy medium strength silty CLAY of high plasticity. Sand is fine to coarse.	0.80 - 1.00	B+ES	
					1.20	HV	51kPa
					1.40 - 1.60	D	
		1.60		Stiff brown to greyish brown slightly sandy slightly gravelly high strength CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of sandstone, limestone and mudstone.	1.80 - 2.00	D	
					2.00	HV	87kPa
G					2.80 - 3.00	D	
					3.00	HV	115kPa
					3.80 - 4.00	D	
					4.00	HV	123kPa
					4.80 - 5.00	D	
		5.00		End of Borehole at 5.000m	5.00	HV	101kPa

Hole Diameter		Casing Depths		General Remarks	Chiselling			Ground Water				
Depth Base (m)	Diameter (mm)	Depth Base (m)	Diameter (mm)		From (m)	To (m)	Time (hr)	Depth Strike (m)	Depth Casing (m)	Depth Sealed (m)	Time Elapsed (min)	Water Level (m)
				1.2m Hand excavated inspection pit dug. No groundwater encountered. Gas standpipe installed on completion.								

SOLMEK
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Stockton on Tees
TS18 3NA
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Borehole Log

Scale 1:50 Sheet 1 of 1

BH04

Contract no:	S230223	**Site:**	Simonside Arms, South Shields	**Driller:**	SR Drilling Ltd
				Plant used:	Mini Rig
				Started:	03/03/2023
Client:	Origin Planning Services Ltd			**Ended:**	03/03/2023
Method:	Small Percussive			**Backfilled:**	03/03/2023

GL (AOD):
Easting: 435061
Northing: 564432
Logged: AC
Status: FINAL

Backfill / Installation	Legend	Depth (m)	Level (m AOD)	Stratum Description	Samples and Insitu Testing		
					Depth (m)	Type	Results
				MADE GROUND: Dark brown ashy slightly clayey gravelly sand. Sand is fine to coarse. Gravel is angular to subangular fine to coarse of brick, clinker, concrete and sandstone.	0.20 - 0.40	B+ES	
		0.40		MADE GROUND: Soft to firm grey to dark brownish grey slightly organic clay. Rare pieces of partially decomposed plant material noted.	0.40 - 0.60	B+ES	
		0.60		Firm light brown mottled orangish brown and grey slightly sandy medium strength CLAY. Sand is fine to coarse.	0.80 - 1.00	B+ES	
					1.20	HV	56kPa
					1.40 - 1.60	D	
		1.80		Stiff brown to greyish brown slightly sandy slightly gravelly high strength CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of sandstone, limestone and mudstone.	1.80 - 2.00	D	
					2.00	HV	78kPa
					2.80 - 3.00	D	
					3.00	HV	135kPa
					3.80 - 4.00	D	
					4.00	HV	134kPa
					4.80 - 5.00	D	
		5.00		End of Borehole at 5.000m	5.00	HV	112kPa

Hole Diameter		Casing Depths		General Remarks	Chiselling			Ground Water				
Depth Base (m)	Diameter (mm)	Depth Base (m)	Diameter (mm)		From (m)	To (m)	Time (hr)	Depth Strike (m)	Depth Casing (m)	Depth Sealed (m)	Time Elapsed (min)	Water Level (m)
				1.2m Hand excavated inspection pit dug. No groundwater encountered. Borehole backfilled on completion.								

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Stockton on Tees
TS18 3NA
01642 607083
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Borehole Log

Scale 1:50 Sheet 1 of 1

BH05

Contract no:	S230223	**Site:**	Simonside Arms, South Shields	**Driller:**	SR Drilling Ltd
				Plant used:	Mini Rig
				Started:	03/03/2023
Client:	Origin Planning Services Ltd			**Ended:**	03/03/2023
Method:	Small Percussive			**Backfilled:**	03/03/2023

GL (AOD):
Easting: 435042
Northing: 564414
Logged: AC
Status: FINAL

Backfill / Installation	Legend	Depth (m)	Level (m AOD)	Stratum Description	Samples and Insitu Testing		
					Depth (m)	Type	Results
				MADE GROUND: Dark brown ashy slightly clayey gravelly sand. Sand is fine to coarse. Gravel is angular to subangular fine to coarse of brick, clinker, concrete and sandstone.	0.20 - 0.40	B+ES	
		0.40		MADE GROUND: Soft to firm grey to dark brownish grey slightly sandy slightly gravelly clay. Sand is fine to coarse. Gravel is angular to subangular fine to coarse of brick and sandstone.	0.40 - 0.60	B+ES	
					0.80 - 1.00	B+ES	
		1.20		Soft light brown mottled orangish brown and grey slightly sandy low strength CLAY of intermediate plasticity. Sand is fine to coarse.	1.20	HV	23kPa
		1.40		Stiff brown to greyish brown slightly sandy slightly gravelly high strength CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of sandstone, limestone and mudstone.	1.40 - 1.60	D	
					1.80 - 2.00	D	
					2.00	HV	78kPa
G					2.80 - 3.00	D	
					3.00	HV	112kPa
					3.80 - 4.00	D	
					4.00	HV	132kPa
					4.80 - 5.00	D	
		5.00		End of Borehole at 5.000m	5.00	HV	128kPa

Hole Diameter		Casing Depths		General Remarks	Chiselling			Ground Water				
Depth Base (m)	Diameter (mm)	Depth Base (m)	Diameter (mm)		From (m)	To (m)	Time (hr)	Depth Strike (m)	Depth Casing (m)	Depth Sealed (m)	Time Elapsed (min)	Water Level (m)
				1.2m Hand excavated inspection pit dug. No groundwater encountered. Gas standpipe installed on completion.								

APPENDIX C

Certificate of Analysis

Certificate Number 23-06314 *Issued:* 28-Mar-23

Client SOLMEK
12 Yarm Road
Stockton On Tees
Cleveland
TS18 3NA

Our Reference 23-06314

Client Reference S230223

Order No SOL7120AC

Contract Title Simonside Arms, South Shileds

Description 5 Soil samples.

Date Received 16-Mar-23

Date Started 16-Mar-23

Date Completed 28-Mar-23

Test Procedures Identified by prefix DETSn (details on request).

Notes Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. 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 except in full, without the prior written approval of the laboratory.

Approved By

Kirk Bridgewood
General Manager

mCERTS
THE ENVIRONMENT AGENCY'S MONITORING CERTIFICATION SCHEME

ilac-MRA

UKAS TESTING
2139

Summary of Chemical Analysis
Matrix Descriptions

Our Ref 23-06314
Client Ref S230223
Contract Title Simonside Arms, South Shileds

Sample ID	Depth	Lab No	Completed	Matrix Description
BH01	0.40-0.60	2141263	28/03/2023	Brown sandy CLAY including some rootlets (Possible made ground - brick)
BH02	0.20-0.40	2141264	28/03/2023	Brown clayey, gravelly SAND including some rootlets (Possible made ground - brick)
BH03	0.20-0.40	2141265	28/03/2023	Brown gravelly, SAND including some rootlets (Possible made ground - brick)
BH04	0.40-0.60	2141266	28/03/2023	Brown gravelly, sandy CLAY including some rootlets (Possible made ground - brick)
BH05	0.80-1.00	2141267	28/03/2023	Brown gravelly, sandy CLAY including some rootlets (Possible made ground - brick)

Summary of Chemical Analysis
Soil Samples

Our Ref 23-06314
Client Ref S230223
Contract Title Simonside Arms, South Shileds

			Lab No	2141263	2141264	2141265	2141266	2141267
			.Sample ID	BH01	BH02	BH03	BH04	BH05
			Depth	0.40-0.60	0.20-0.40	0.20-0.40	0.40-0.60	0.80-1.00
			Other ID					
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL
			Sampling Date	03/03/2023	03/03/2023	03/03/2023	03/03/2023	03/03/2023
			Sampling Time	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**					
Metals								
Arsenic	DETSC 2301#	0.2	mg/kg	18	19	22	18	26
Boron, Water Soluble	DETSC 2311#	0.2	mg/kg	0.4	0.2	0.7	0.5	0.8
Cadmium	DETSC 2301#	0.1	mg/kg	0.3	0.4	0.5	0.3	0.5
Chromium	DETSC 2301#	0.15	mg/kg	25	19	23	25	28
Copper	DETSC 2301#	0.2	mg/kg	83	130	110	71	150
Lead	DETSC 2301#	0.3	mg/kg	190	190	470	210	710
Mercury	DETSC 2325#	0.05	mg/kg	0.38	0.27	0.46	0.78	0.63
Nickel	DETSC 2301#	1	mg/kg	23	26	31	25	38
Selenium	DETSC 2301#	0.5	mg/kg	< 0.5	0.8	< 0.5	< 0.5	< 0.5
Zinc	DETSC 2301#	1	mg/kg	140	200	180	110	280
Inorganics								
pH	DETSC 2008#		pH	7.8	10.8	7.7	7.7	7.5
Cyanide, Total	DETSC 2130#	0.1	mg/kg	0.2	0.2	0.3	0.2	0.8
Organic matter	DETSC 2002#	0.1	%	3.7	3.3	4.3	5.2	3.3
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	33	68	21	15	41
Petroleum Hydrocarbons								
Aliphatic C5-C6: HS_1D_AL	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C6-C8: HS_1D_AL	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C8-C10: HS_1D_AL	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic >EC10-EC12: EH_2D_AL	DETSC 3521#	1.5	mg/kg	< 1.50	< 1.50	2.33	1.90	< 1.50
Aliphatic >EC12-EC16: EH_2D_AL	DETSC 3521#	1.2	mg/kg	< 1.20	< 1.20	2.24	1.97	< 1.20
Aliphatic >EC16-EC21: EH_2D_AL	DETSC 3521#	1.5	mg/kg	< 1.50	< 1.50	< 1.50	< 1.50	< 1.50
Aliphatic >EC21-EC35: EH_2D_AL	DETSC 3521#	3.4	mg/kg	9.27	7.91	12.05	9.32	9.02
Aliphatic C5-C35: EH_2D+HS_1D_AL	DETSC 3521*	10	mg/kg	< 10.00	< 10.00	16.61	13.19	< 10.00
Aromatic C5-C7: HS_1D_AR	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C7-C8: HS_1D_AR	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C8-C10: HS_1D_AR	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic >EC10-EC12: EH_2D_AR	DETSC 3521#	0.9	mg/kg	< 0.90	< 0.90	< 0.90	< 0.90	< 0.90
Aromatic >EC12-EC16: EH_2D_AR	DETSC 3521#	0.5	mg/kg	< 0.50	1.01	< 0.50	< 0.50	< 0.50
Aromatic >EC16-EC21: EH_2D_AR	DETSC 3521#	0.6	mg/kg	0.79	22.56	1.90	0.81	6.27
Aromatic >EC21-EC35: EH_2D_AR	DETSC 3521#	1.4	mg/kg	< 1.40	44.85	13.84	< 1.40	5.21
Aromatic C5-C35: EH_2D+HS_1D_AR	DETSC 3521*	10	mg/kg	< 10.00	68.42	15.74	< 10.00	11.48
TPH Ali/Aro Total C5-C35: EH_2D+HS_1D_Total	DETSC 3521*	10	mg/kg	< 10.00	68.42	32.35	13.19	11.48
PAHs								
Naphthalene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	0.2
Acenaphthylene	DETSC 3301	0.1	mg/kg	< 0.1	2.7	0.1	< 0.1	0.9
Acenaphthene	DETSC 3301	0.1	mg/kg	< 0.1	0.7	< 0.1	< 0.1	0.3
Fluorene	DETSC 3301	0.1	mg/kg	< 0.1	2.7	< 0.1	< 0.1	0.6
Phenanthrene	DETSC 3301	0.1	mg/kg	0.3	16	0.3	0.2	4.8
Anthracene	DETSC 3301	0.1	mg/kg	0.1	8.6	< 0.1	< 0.1	1.2

Key: * -not accredited. # -MCERTS (accreditation only applies if report carries the MCERTS logo). n/s -not supplied.

Summary of Chemical Analysis
Soil Samples

Our Ref 23-06314
Client Ref S230223
Contract Title Simonside Arms, South Shileds

			Lab No	2141263	2141264	2141265	2141266	2141267
			.Sample ID	BH01	BH02	BH03	BH04	BH05
			Depth	0.40-0.60	0.20-0.40	0.20-0.40	0.40-0.60	0.80-1.00
			Other ID					
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL
			Sampling Date	03/03/2023	03/03/2023	03/03/2023	03/03/2023	03/03/2023
			Sampling Time	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**					
Fluoranthene	DETSC 3301	0.1	mg/kg	0.6	40	0.8	0.7	13
Pyrene	DETSC 3301	0.1	mg/kg	0.6	33	0.8	0.7	12
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg	0.3	30	0.5	0.3	7.1
Chrysene	DETSC 3301	0.1	mg/kg	0.4	32	0.6	0.9	8.1
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg	0.3	22	0.5	0.4	5.6
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg	0.2	13	0.2	0.2	3.5
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg	0.4	27	0.6	0.4	7.7
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg	0.4	16	0.7	0.4	4.7
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg	0.1	4.8	0.2	0.1	0.9
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg	0.3	15	0.4	0.4	4.4
PAH 16 Total	DETSC 3301	1.6	mg/kg	4.2	270	5.9	5.0	75
Phenols								
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	0.4	< 0.3	0.4	< 0.3	0.4

Summary of Asbestos Analysis
Soil Samples

Our Ref 23-06314
Client Ref S230223
Contract Title Simonside Arms, South Shileds

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
2141263	BH01 0.40-0.60	SOIL	NAD	none	Michael Kay
2141264	BH02 0.20-0.40	SOIL	NAD	none	Michael Kay
2141265	BH03 0.20-0.40	SOIL	NAD	none	Michael Kay
2141266	BH04 0.40-0.60	SOIL	NAD	none	Michael Kay
2141267	BH05 0.80-1.00	SOIL	NAD	none	Michael Kay

Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: * - not included in laboratory scope of accreditation.

Information in Support of the Analytical Results

Our Ref 23-06314
Client Ref S230223
Contract Simonside Arms, South Shileds

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
2141263	BH01 0.40-0.60 SOIL	03/03/23	GJ 250ml, GJ 60ml, PT 1L		
2141264	BH02 0.20-0.40 SOIL	03/03/23	GJ 250ml, GJ 60ml, PT 1L		
2141265	BH03 0.20-0.40 SOIL	03/03/23	GJ 250ml, GJ 60ml, PT 1L		
2141266	BH04 0.40-0.60 SOIL	03/03/23	GJ 250ml, GJ 60ml, PT 1L		
2141267	BH05 0.80-1.00 SOIL	03/03/23	GJ 250ml, GJ 60ml, PT 1L		

Key: G-Glass P-Plastic J-Jar T-Tub

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.

Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.

The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

Information in Support of the Analytical Results

List of HWOL Acronyms and Operators

Acronym	Description
HS	Headspace analysis
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent
CU	Clean-up - e.g. by florisil, silica gel
1D	GC - Single coil gas chromatography
2D	GC-GC - Double coil gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics only
AR	Aromatics only
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +)
+	Operator to indicate cumulative eg. EH+HS_Total or EH_CU+HS_Total

Det	Acronym
Aliphatic C5-C6	HS_1D_AL

Appendix A - Details of Analysis

Method	Parameter	Units	Limit of Detection	Sample Preparation	Sub-Contracted	UKAS	MCERTS
DETSC 2002	Organic matter	%	0.1	Air Dried	No	Yes	Yes
DETSC 2003	Loss on ignition	%	0.01	Air Dried	No	Yes	Yes
DETSC 2008	pH	pH Units	1	Air Dried	No	Yes	Yes
DETSC 2024	Sulphide	mg/kg	10	Air Dried	No	Yes	Yes
DETSC 2076	Sulphate Aqueous Extract as SO4	mg/l	10	Air Dried	No	Yes	Yes
DETSC 2084	Total Carbon	%	0.5	Air Dried	No	Yes	Yes
DETSC 2084	Total Organic Carbon	%	0.5	Air Dried	No	Yes	Yes
DETSC 2119	Ammoniacal Nitrogen as N	mg/kg	0.5	Air Dried	No	Yes	Yes
DETSC 2130	Cyanide free	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC 2130	Cyanide total	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC 2130	Phenol - Monohydric	mg/kg	0.3	Air Dried	No	Yes	Yes
DETSC 2130	Thiocyanate	mg/kg	0.6	Air Dried	No	Yes	Yes
DETSC 2321	Total Sulphate as SO4	%	0.01	Air Dried	No	Yes	Yes
DETSC 2325	Mercury	mg/kg	0.05	Air Dried	No	Yes	Yes
DETSC 3049	Sulphur (free)	mg/kg	0.75	Air Dried	No	Yes	Yes
DETSC2123	Boron (water soluble)	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC2301	Arsenic	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC2301	Barium	mg/kg	1.5	Air Dried	No	Yes	Yes
DETSC2301	Beryllium	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC2301	Cadmium Available	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC2301	Cadmium	mg/kg	0.1	Air Dried	No	Yes	Yes
DETSC2301	Cobalt	mg/kg	0.7	Air Dried	No	Yes	Yes
DETSC2301	Chromium	mg/kg	0.15	Air Dried	No	Yes	Yes
DETSC2301	Copper	mg/kg	0.2	Air Dried	No	Yes	Yes
DETSC2301	Manganese	mg/kg	20	Air Dried	No	Yes	Yes
DETSC2301	Molybdenum	mg/kg	0.4	Air Dried	No	Yes	Yes
DETSC2301	Nickel	mg/kg	1	Air Dried	No	Yes	Yes
DETSC2301	Lead	mg/kg	0.3	Air Dried	No	Yes	Yes
DETSC2301	Selenium	mg/kg	0.5	Air Dried	No	Yes	Yes
DETSC2301	Zinc	mg/kg	1	Air Dried	No	Yes	Yes
DETSC 3072	Ali/Aro C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C10-C12	mg/kg	1.5	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C10-C12	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C12-C16	mg/kg	1.2	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C12-C16	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C16-C21	mg/kg	1.5	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C16-C21	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C21-C35	mg/kg	3.4	As Received	No	Yes	Yes
DETSC 3072	Aliphatic C21-C35	mg/kg	3.4	As Received	No	Yes	Yes
DETSC 3072	Aromatic C10-C12	mg/kg	0.9	As Received	No	Yes	Yes
DETSC 3072	Aromatic C10-C12	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aromatic C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aromatic C12-C16	mg/kg	0.5	As Received	No	Yes	Yes
DETSC 3072	Aromatic C12-C16	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aromatic C16-C21	mg/kg	0.6	As Received	No	Yes	Yes
DETSC 3072	Aromatic C16-C21	mg/kg	10	As Received	No	Yes	Yes
DETSC 3072	Aromatic C21-C35	mg/kg	1.4	As Received	No	Yes	Yes
DETSC 3072	Aromatic C21-C35	mg/kg	1.4	As Received	No	Yes	Yes
DETS 062	Benzene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	Ethylbenzene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	Toluene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	m+p Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	o Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3311	C10-C24 Diesel Range Organics (DRO)	mg/kg	10	As Received	No	Yes	Yes
DETSC 3311	C24-C40 Lube Oil Range Organics (LORO)	mg/kg	10	As Received	No	Yes	Yes
DETSC 3311	EPH (C10-C40)	mg/kg	10	As Received	No	Yes	Yes

Appendix A - Details of Analysis

Method	Parameter	Units	Limit of Detection	Sample Preparation	Sub-Contracted	UKAS	MCERTS
DETSC 3303	Acenaphthene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Acenaphthylene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(a)pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(a)anthracene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(b)fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(k)fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Benzo(g,h,i)perylene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Dibenzo(a,h)anthracene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Indeno(1,2,3-c,d)pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Naphthalene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Phenanthrene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3303	Pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETSC 3401	PCB 28 + PCB 31	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 52	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 101	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 118	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 153	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 138	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB 180	mg/kg	0.01	As Received	No	Yes	Yes
DETSC 3401	PCB Total	mg/kg	0.01	As Received	No	Yes	Yes

Method details are shown only for those determinands listed in Annex A of the MCERTS standard. Anything not included on this list falls outside the scope of MCERTS. No Recovery Factors are used in the determination of results. Results reported assume 100% recovery. Full method statements are available on request.

End of Report

APPENDIX D

Laboratory Report Front Sheet

Site name	Job number
Simonside Arms, South Shields	S230223

G2M Testing (Stockton)
12-16 Yarm Road,
Stockton on Tees,
TS18 3NA
01642 033318
info@g2mtesting.co.uk

UKAS TESTING
10258

Client details:

Reference: S230223
Name: Solmek
Address: 12 Yarm Road,
Stockton-on-tees,
TS18 3NA

Telephone: 01642 607083
Email: acutts@solmek.com

FAO: Adrain Cutts

Samples received:

Date commenced: 16/03/2023

Date reported: 03/04/2023

Observations and interpretations are outside of the UKAS Accreditiation

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 in full, without the prior written approval of the laboratory.

Samples will be held at the laboratory for a period of 4 weeks after the report date. After the above reporting date the samples will be disposed of. Should further testing be required then the office should be informed before the above date.

Signature:	Approved Signitories:
	☐ D.Anderson (Managing Director) ☑ J. Brischuk (Laboratory Manager) ☐ T. Finnimore (Quality/Technical Manager)

Summary of Classification Tests

G2M Testing (Stockton)
12-16 Yarm Road,
Stockton on Tees,
TS18 3NA
01642 033318
info@g2mtesting.co.uk

UKAS TESTING

10258

Site name	Job number
Simonside Arms, South Shields	S230223

Hole	Depth		Type	*w*	Oven temp.	wa	Pa	Pr	wL	wP	IP	IL	Plasticity class	Preparation method
	Top m	Base m		%	oc	%	%	%	%	%	%			
BH01	0.80		B	26	105	28	94	6	48-s	24	24	0.167	CI	Tested after >425µm removed by hand
BH03	0.80		B	34	105	36	94	6	62-s	31	31	0.161	MH	Tested after >425µm removed by hand
BH03	1.40		B	38	105									
BH05	1.40		B	27	105	27	99	1	45-s	23	22	0.182	CI	Tested after >425µm removed by hand

All tests found in G2M Testing UKAS Schedule of Accreditation are tested to standard unless otherwise indicated

Key	Description	Category	BS Test Code
w	Moisture content		BS 1377:1990 Part 2 Clause 3.2
wa	Equivalent moisture content passing 425µm sieve		BS 1377:1990 Part 2 Clause 3.2
wL	Liquid limit Single point	-s	BS 1377:1990 Part 2 Clause 4.4
	Liquid limit Four point	-f	BS 1377:1990 Part 2 Clause 4.3
wP	Plastic limit		BS 1377:1990 Part 2 Clause 5.2
Pa	Percentage passing 425um sieve		
Pr	Percentage retained 425um sieve		
IP	Plasticity index		BS 1377:1990 Part 2 Clause 5.4
IL	Liquidity index		BS 1377:1990 Part 2 Clause 5.4
	Suffix indicating test is "Not UKAS Accredited"	*	

Approved by	D Anderson
Approval date	27/03/2023 08:21
Date report generated	
Report Number	

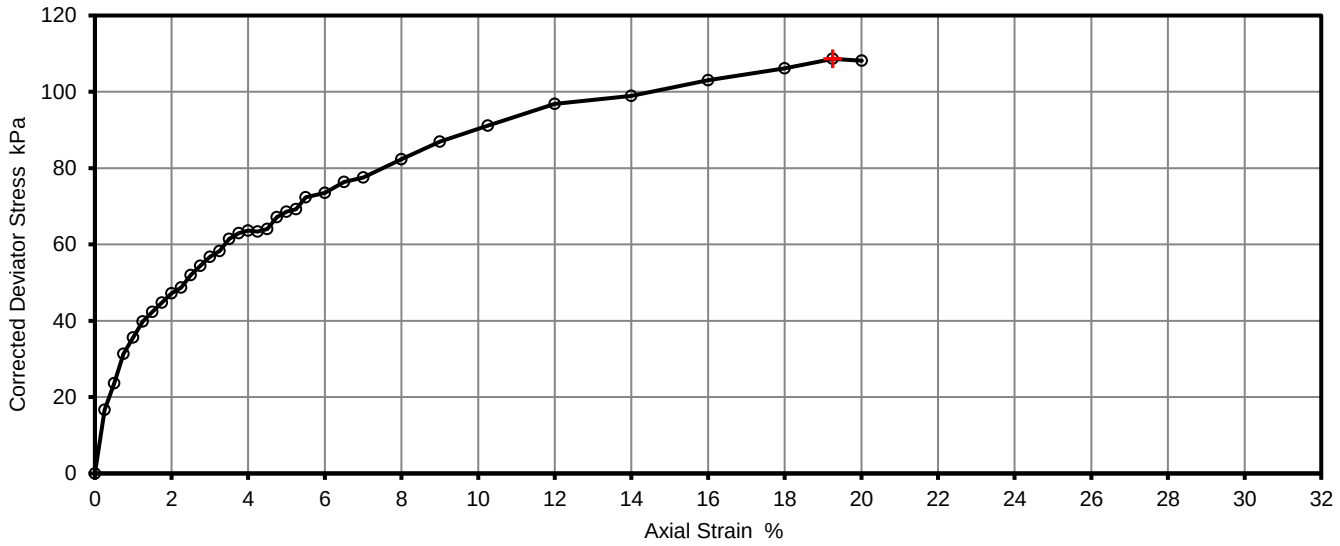
UKAS TESTING 10258	**Unconsolidated Undrained Triaxial Compression Test without measurement of pore pressure - single specimen**			Job Ref	S230223
				Borehole/Pit No.	BH01
Site Name	Simonside Arms, South Shields			Sample No.	
Soil Description				Depth	0.80
Specimen Reference	BH01	Specimen Depth	0.80 m	Sample Type	B
Specimen Description	Medium Strength CLAY			KeyLAB ID	G2MT2023031618
Test Method				Date of test	29/03/2023

Test Number	1	
Length	76.0	mm
Diameter	38.0	mm
Bulk Density	1.91	Mg/m3
Moisture Content	28.7	%
Dry Density	1.49	Mg/m3
Rate of Strain	1.0	%/min
Cell Pressure	16	kPa
At failure: Axial Strain	19.3	%
At failure: Deviator Stress, (σ1 - σ3)f	109	kPa
At failure: Undrained Shear Strength, cu	54	kPa ½(σ1 - σ3)f
At failure: Mode of Failure	Plastic	

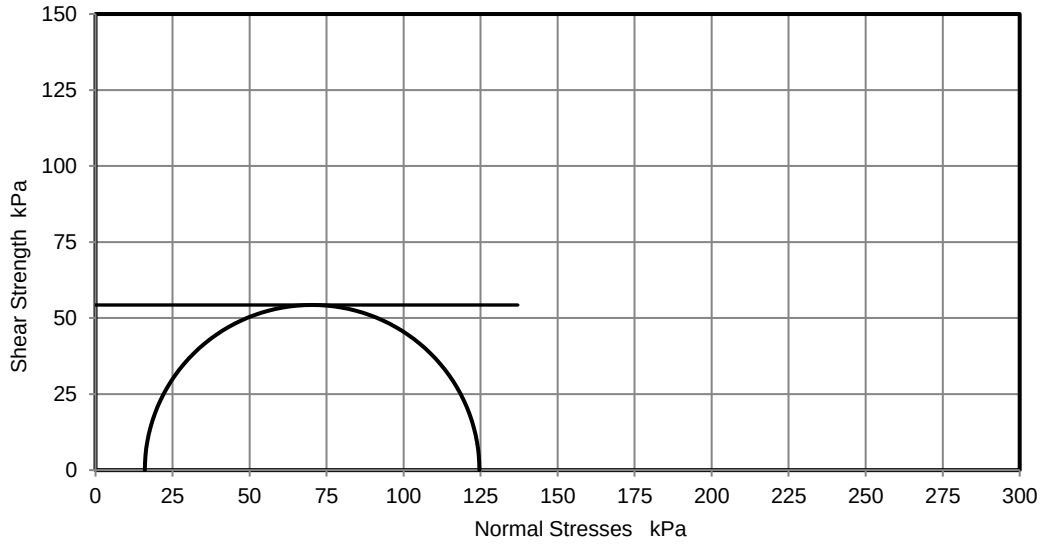
Tracable Equipment Record

Test Frame	TRI 004
Load Ring	
Pressure Gauge	PRE 004
Digital Caliper	CAL 006
Balance	BAL 011

Deviator Stress v Axial Strain



Mohr Circles



Deviator stress corrected for area change and membrane effects

Mohr circles and their interpretation is not covered by BS1377 Part 8- 1990. This is provided for information only.

No of membranes used
1
Total thickness (mm)
0.25
Membrane Correction
Membrane Type

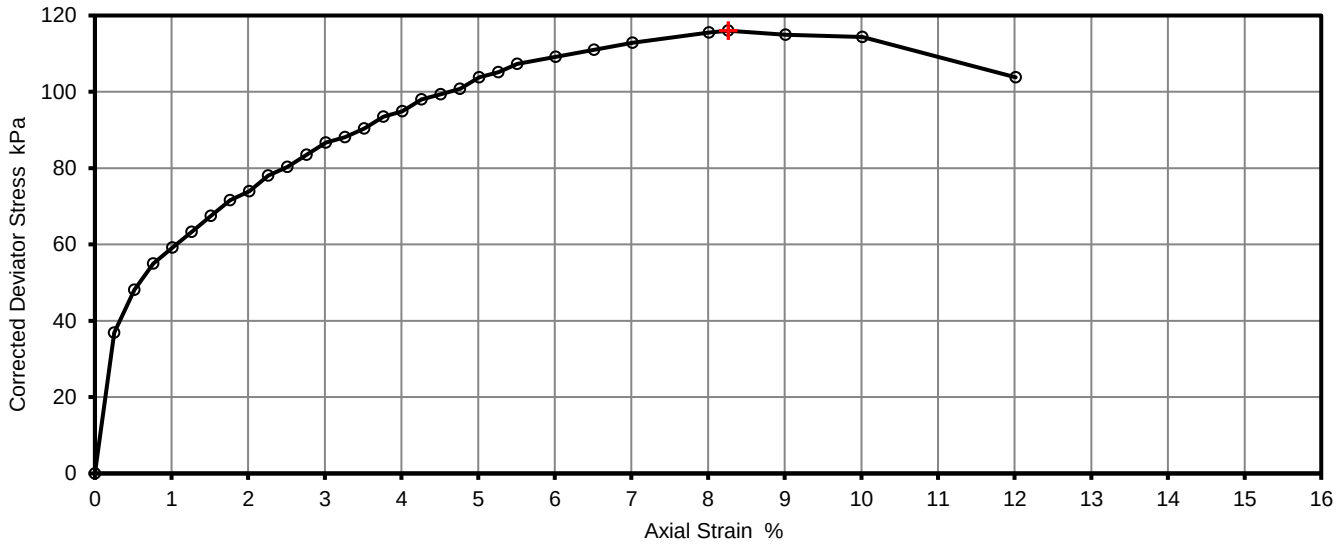
UKAS TESTING 10258	**Unconsolidated Undrained Triaxial Compression Test without measurement of pore pressure - single specimen**			Job Ref	S230223
				Borehole/Pit No.	BH03
Site Name	Simonside Arms, South Shields			Sample No.	
Soil Description				Depth	1.40
Specimen Reference	BH03	Specimen Depth	1.40 m	Sample Type	B
Specimen Description	Medium Strength CLAY			KeyLAB ID	G2MT2023031620
Test Method				Date of test	27/03/2023

Test Number	1	
Length	76.0	mm
Diameter	38.0	mm
Bulk Density	1.85	Mg/m3
Moisture Content	37.6	%
Dry Density	1.35	Mg/m3
Rate of Strain	1.0	%/min
Cell Pressure	28	kPa
At failure: Axial Strain	8.3	%
At failure: Deviator Stress, (σ1 - σ3)f	116	kPa
At failure: Undrained Shear Strength, cu	58	kPa ½(σ1 - σ3)f
At failure: Mode of Failure		

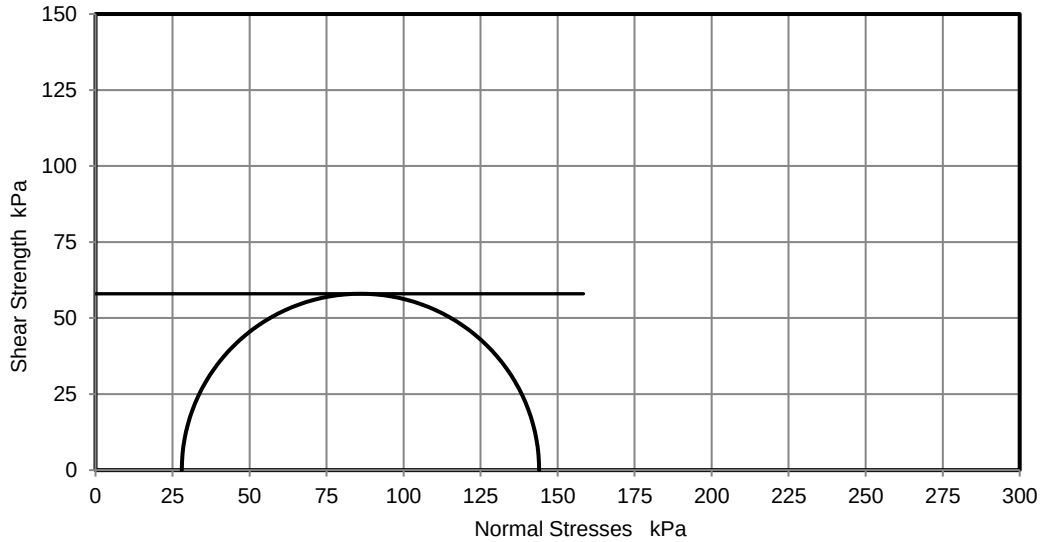
Tracable Equipment Record

Test Frame	TRI 004
Load Ring	LOAD CELL 003
Pressure Gauge	PRE 004
Digital Caliper	CAL 006
Balance	BAL 011

Deviator Stress v Axial Strain



Mohr Circles



Deviator stress corrected for area change and membrane effects

Mohr circles and their interpretation is not covered by BS1377 Part 8- 1990. This is provided for information only.

No of membranes used
1
Total thickness (mm)
0.25
Membrane Correction
Membrane Type

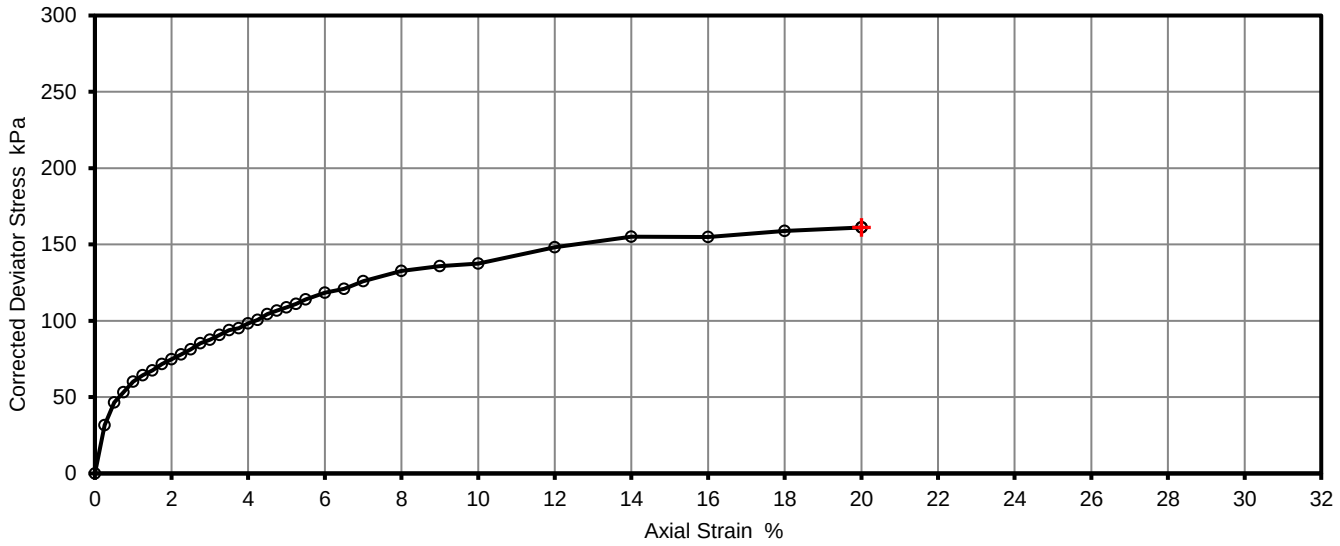
UKAS TESTING 10258	**Unconsolidated Undrained Triaxial Compression Test without measurement of pore pressure - single specimen**			Job Ref	S230223
				Borehole/Pit No.	BH05
Site Name	Simonside Arms, South Shields			Sample No.	
Soil Description				Depth	1.40
Specimen Reference	BH05	Specimen Depth	1.40 m	Sample Type	B
Specimen Description	High Strength CLAY			KeyLAB ID	G2MT2023031621
Test Method				Date of test	27/03/2023

Test Number	1	
Length	76.0	mm
Diameter	38.0	mm
Bulk Density	1.98	Mg/m3
Moisture Content	24.9	%
Dry Density	1.59	Mg/m3
Rate of Strain	1.0	%/min
Cell Pressure	28	kPa
At failure: Axial Strain	20.0	%
At failure: Deviator Stress, (σ1 - σ3)f	161	kPa
At failure: Undrained Shear Strength, cu	81	kPa ½(σ1 - σ3)f
At failure: Mode of Failure		

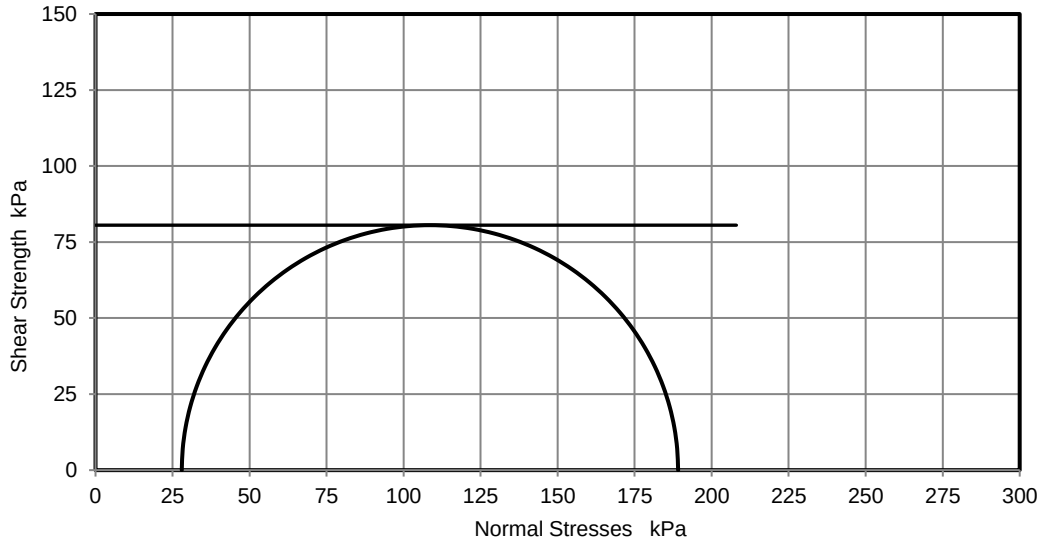
Tracable Equipment Record

Test Frame	TRI 004
Load Ring	LOAD CELL 003
Pressure Gauge	PRE 004
Digital Caliper	CAL 006
Balance	BAL 011

Deviator Stress v Axial Strain



Mohr Circles



Deviator stress corrected for area change and membrane effects

Mohr circles and their interpretation is not covered by BS1377 Part 8- 1990. This is provided for information only.

No of membranes used
1
Total thickness (mm)
0.25
Membrane Correction
Membrane Type

Certificate of Analysis

Certificate Number 23-06602 *Issued:* 24-Mar-23

Client SOLMEK
12 Yarm Road
Stockton On Tees
Cleveland
TS18 3NA

Our Reference 23-06602

Client Reference S230223

Order No LAB1825

Contract Title SIMONSIDE ARMS, SOUTH SHIELDS

Description 3 Soil samples.

Date Received 20-Mar-23

Date Started 20-Mar-23

Date Completed 24-Mar-23

Test Procedures Identified by prefix DETSn (details on request).

Notes Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. 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 except in full, without the prior written approval of the laboratory.

Approved By

Kirk Bridgewood
General Manager

2139

Summary of Chemical Analysis
Soil Samples

Our Ref 23-06602
Client Ref S230223
Contract Title SIMONSIDE ARMS, SOUTH SHIELDS

			Lab No	2143188	2143189	2143190
			.Sample ID	BH01	BH03	BH05
			Depth	0.80	1.40	1.40
			Other ID			
			Sample Type	SOIL	SOIL	SOIL
			Sampling Date	03/03/2023	03/03/2023	03/03/2023
			Sampling Time	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**			
Inorganics						
pH	DETSC 2008#		pH	8.0	7.8	7.8
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	26	19	33

Key: # -MCERTS (accreditation only applies if report carries the MCERTS logo). n/s -not supplied.

Information in Support of the Analytical Results

Our Ref 23-06602
Client Ref S230223
Contract SIMONSIDE ARMS, SOUTH SHIELDS

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
2143188	BH01 0.80 SOIL	03/03/23	PT 1L		
2143189	BH03 1.40 SOIL	03/03/23	PT 1L		
2143190	BH05 1.40 SOIL	03/03/23	PT 1L		

Key: P-Plastic T-Tub

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.

Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.

The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

End of Report

APPENDIX E

SOLMEK NOTES ON CONTAMINATION GUIDANCE (REF: VERSION 1/2023)

UK BACKGROUND

Environmental Protection Act 1990: Part 2A Revised Statutory Guidance (April 2012)

This revised document explains how the Local Authority should decide if land, based on a legal interpretation, is contaminated. The document replaces the previous guidance given in Annex 3 of DEFRA Circular 01/2006, issued in accordance with section 78YA of the 1990 Environmental Protection Act.

The main objectives of the Part 2A regime are to *"identify and remove unacceptable risks to human health and the environment" and* to *"seek to ensure that contaminated land is made suitable for its current use".*

Part 2A uses a risk based approach to defining contaminated land whereby the "risk" is interpreted as *"the likelihood that harm, or pollution of water, will occur as a result of contaminants in, on or under the land"* and by *"the scale and seriousness of such harm or pollution if it did occur".*

For a relevant risk to exist a contaminant, pathway and receptor linkage must be present before the land can be considered to be contaminated. The document explains that *"for a risk to exist there must be contaminants present in, on or under the land in a form and quantity that poses a hazard, and one or more pathways by which they might significantly harm people, the environment, or property; or significantly pollute controlled waters."*

A conceptual model is used to develop and communicate the risks associated with a particular site.

To determine if land is contaminated the local authority use various categories from 1 to 4. Categories 1 and 2 include *"land which is capable of being determined as contaminated land on grounds of significant possibility of significant harm to human health."*

Categories 3 and 4 *"encompass land which is not capable of being determined on such grounds".*

PRELIMINARY CONCEPTUAL MODEL

Preliminary Conceptual Models are undertaken in accordance with CIRIA C552. The Preliminary Conceptual Model assesses the consequence and the likelihood of a risk being realised to provide a risk classification, using the tables detailed below.

CONSEQUENCE OF RISK BEING REALISED (Based on C552 CIRIA, 2001)

Classification	Definition	Example
Severe	Short-term (acute) risk to human health, the environment, an element of the development or other aspect with is likely to result in *significant harm*, damage or both.	High concentrations of cyanide on the surface of an informal recreational area. Major spills of contaminants from site into controlled water. High concentrations of explosive gas in the subsurface environment that have a clear unobstructed pathway into buildings.
Moderate	Chronic damage to human health, a plausible chance that an event will occur, although the timeline is not immediate to be in the short-term.	Appreciable concentration of contamination that over the longer-term will cause significant harm i.e. high lead concentration in topsoil. Shallow mine workings that are potentially unstable but may remain in a satisfactory or stable conditions for a number of years.
Mild	Low level pollution of non-sensitive water, a feasible hazardous scenario although the timeline of such occurring can probably be considered in 10's of years.	The effect of high sulphate concentrations on structural concrete. Pollution of non-classified groundwater.
Minor	Harm, although not necessarily significant to human health, or with respect to other aspects of the development, which are considered implausible in terms of occurrence, or will have little consequential impact.	The presence of contaminants at such low concentrations that protective equipment is required during site works. Any damage to structures is minimal and will not be structural in characteristics.

PROBABILITY OF RISK BEING REALISED (C552 CIRIA, 2001)

Classification	Definition
High Likelihood	There is a viable pollutant linkage and an event that either appears very likely in the short term and almost inevitable over the long term, or there is evidence that the receptor has been harmed or polluted.
Likely	There is a viable pollutant linkage and all elements are present and in the right place, which means that it is probable that an event will occur. Circumstances are such that an event is not inevitable, but possible in the short term and likely over the long term.
Low Likelihood	There is a viable pollutant linkage and circumstances are possible under which an event could occur. However, it is by no means certain that even over a longer period such event would take place, and is less likely in the shorter term.
Unlikely	There is a viable pollutant linkage but circumstances are such that it is improbable that an event would occur even in the very long term.

RISK CLASSIFICATION MATRIX (C552 CIRIA, 2001)

Risk = Probability x Consequence		Consequence			
		Severe	Moderate	Mild	Minor
Probability	High likelihood	Very high risk	High risk	Moderate risk	Moderate/low risk
	Likely	High risk	Moderate risk	Moderate/low risk	Low risk
	Low likelihood	Moderate risk	Moderate/low risk	Low risk	Very low risk
	Unlikely	Moderate/low risk	Low risk	Very low risk	Very low risk

HUMAN RECEPTORS

Human exposure to contaminants present in soils can occur via several pathways. Direct exposure pathways include dermal absorption after contact with contaminated ground, inhalation of soil or dust, inhalation of volatised compounds, and inadvertent soil ingestion (or deliberate soil ingestion in the case of some children). Other indirect pathways include human ingestion of plants grown in contaminated soil or contaminated ground or surface water. Contaminants associated with wind blown dust can affect humans on surrounding sites.

VEGETATION

Plants can be affected by soil contamination in a number of ways resulting in growth inhibition, nutrient deficiencies and yellowing of leaves. Contaminants are taken up by plants through the roots and through foliage. Contaminants identified as being highly phytotoxic include boron, cadmium, copper, lead, nickel, and zinc.

To establish if the levels of contaminants present on a site may pose a risk to vegetation the results of the contamination testing are compared to a series of threshold values published in 'Code of Good Agricultural Practice for the Protection of Soil'.

GROUNDWATER AND SURFACE WATER RECEPTORS

The principal pathway by which soil contamination may reach the water environment is through a slow seepage or leaching to groundwater or surface water. The potential for contaminants to migrate along such pathways is dependent on the chemical and physical characteristics of the contaminants and the local hydrogeology. Surface watercourses may also accumulate contamination as contaminated sediments are deposited within the water body.

Where the site investigated overlies major/principal aquifers (and in some cases minor/secondary aquifers depending on certain conditions), groundwater Source Protection Zones and areas in close proximity to groundwater abstractions, contamination test results have been compared with the Water Supply (Water Quality) Regulations 1989 and The Water Supply (Water Quality) Regulations 2000.

Should a surface water receptor, such as a fresh water environment (river, canal, stream, lake etc), or marine environment be considered sensitive in relation to a site, then test results are compared with DEFRA & SEPA Environmental Quality Standards (2004). Many of the Environmental Quality Standards are hardness ($CaCO_3$) depended. Where no hardness values are available, Solmek assume conservative values (of between 0 and 50mg/l).

In the absence of vulnerable ground and surface water environments, Solmek may compare any test results with the Environment Agency Leachate Quality Threshold Values.

DETAILED QUANTITATIVE RISK ASSESSMENT (DQRA)

In line with Environment Agency's guidance document Environment Agency *Land Contamination Risk Management*, which replaced the now-withdrawn *Contaminated Land Report 11 – Model Procedures for the Management of Land Contamination (2004)*, a DQRA for groundwater/human health may be required following a Phase 2 investigation and before the preparation of a Phase 3 Remediation Strategy. For human health DQRA, a site specific assessment criteria is undertaken using CLEA Software Version 1.06. For groundwater DQRA, the Environment Agency Remedial Targets Worksheet Version 3.1 is used.

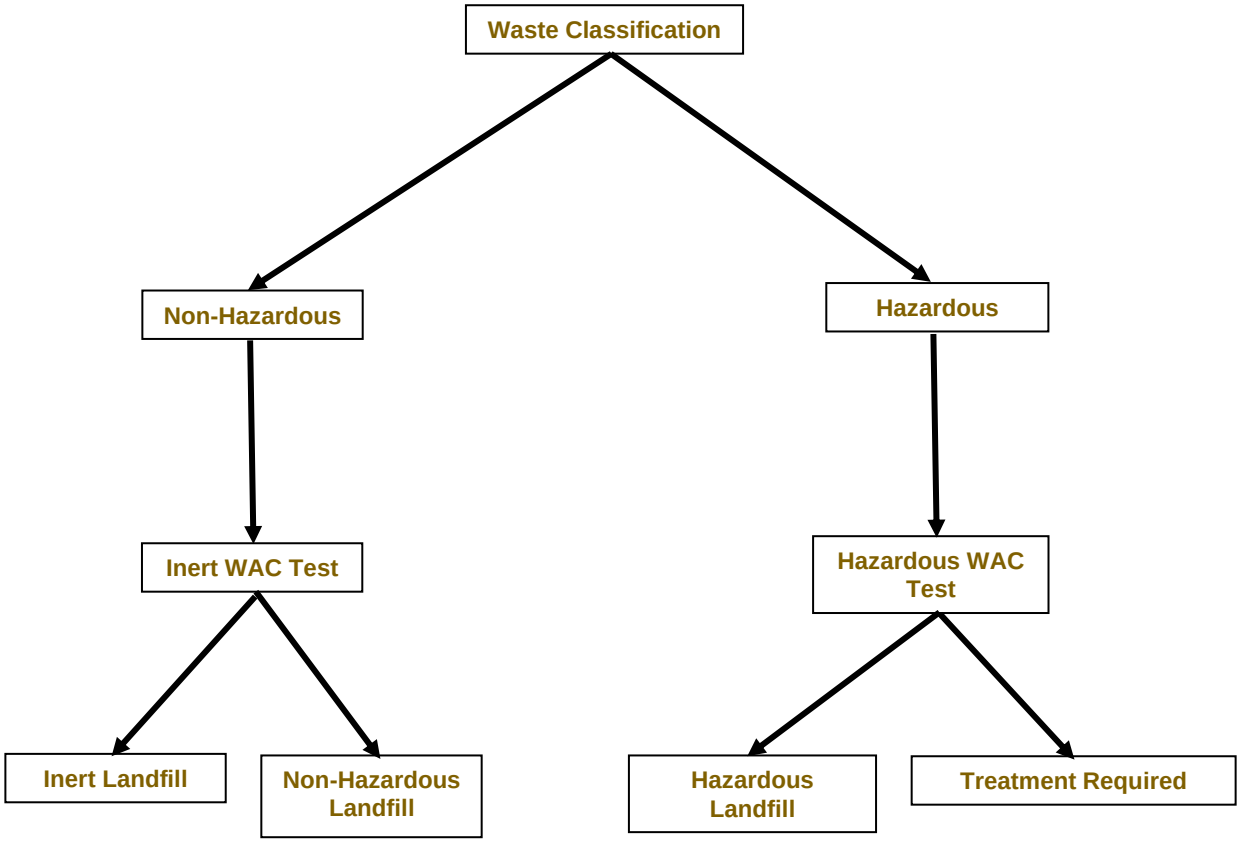
WASTE CLASSIFICATION AND WASTE ACCEPTANCE CRITERIA

During the site strip and construction activities, material may be required to be removed from site. Any such material would require classification, in line with Environment Agency Technical Guidance *Waste Classification: Guidance on the classification and assessment of waste (2015)*. This would classify the material as either Non-Hazardous or Hazardous Waste.

Once the material has been classified, determining the suitable landfill for disposal is governed by landfill directive Waste Acceptance Criteria (WAC) testing, with landfills categorized as Inert Waste, Stable Non-Reactive Hazardous Waste and Hazardous Waste. The WAC testing relates to materials that are to be exported from a site/development to landfill, and do not directly relate to human health specifically. The testing results are generally presented as certificates which can be used by site owners/contractors etc, which should be presented to the accepting waste facility or waste contractor.

If waste classification and/or WAC testing are not undertaken, material taken off site may be subject to WAC testing by the appropriate waste disposal company. The decision on whether or not to accept waste, or whether further testing is required, is at the discretion of the waste disposal company.

The below flow chart provides further information on the waste classification process.



CONSTRUCTION MATERIALS

Materials at risk from possible soil contaminants include inorganic matrices such as cement and concrete and also organic material such as plastics and rubbers. Acid ground conditions and high levels of sulphates can accelerate the corrosion of building materials. Where pH and soluble sulphate analysis has been undertaken, Solmek compare the test results with the guidelines presented within BRE Special Digest 1, 2005 (3rd Edition) 'Concrete in Aggressive Ground'. Plastics and rubbers are generally used for piping and service ducts and are potentially attacked by a range of chemicals, most of which are organic, particularly petroleum based substances. Drinking water supplies can be tainted by substances that can penetrate piping and water companies enforce stringent threshold values.

The levels of potential contaminants should be compared to thresholds supplied in the UK Water Industry Research (UKWIR) publication "Guidance for the selection of Water Supply Pipes to be used in Brownfield Sites" (January 2011). A Brownfield Site is defined in the document as "Land or premises that have not previously been used or developed that may be vacant or derelict". It should be noted that Brownfield sites may not be contaminated. The guidance does not apply to Greenfield Sites however water companies may have their own assessment criteria which should be checked by the developer. The table below outlines the pipe material selection threshold concentrations.

	Pipe Material (Threshold concentrations in mg/kg)					
Parameter group	**PE**	**PVC**	**Barrier pipe (PE-AL-PE)**	**Wrapped Steel**	**Wrapped Ductile Iron**	**Copper**
Extended VOC suite by purge and trap or head space and GC-MS with TIC	0.5	0.125	Pass	Pass	Pass	Pass
+ BTEX + MTBE	0.1	0.03	Pass	Pass	Pass	Pass
SVOCs TIC by purge and trap or head space and GC-MS with TIC (aliphatic and aromatic C5-C10)	2	1.4	Pass	Pass	Pass	Pass
+ Phenols	2	0.4	Pass	Pass	Pass	Pass
+ Cresols and chlorinated phenols	2	0.04	Pass	Pass	Pass	Pass
Mineral oil C11-C20	10	Pass	Pass	Pass	Pass	Pass
Mineral oil C21-C40	500	Pass	Pass	Pass	Pass	Pass
Corrosive (Conductivity, Redox and pH)	Pass	Pass	Pass	Corrosive if pH <7 and conductivity >400µS/cm	Corrosive if pH <5, Eh not neutral and conductivity >400µS/cm	Corrosive if pH <5 or >8 and Eh positive
Specific suite identified as relevant following site investigation						
Ethers	0.5	1	Pass	Pass	Pass	Pass
Nitrobenzene	0.5	0.4	Pass	Pass	Pass	Pass
Ketones	0.5	0.02	Pass	Pass	Pass	Pass
Aldehydes	0.5	0.02	Pass	Pass	Pass	Pass
Amines	Fail	Pass	Pass	Pass	Pass	Pass

REQUIREMENTS OF PARTIES WITHIN THE DEVELOPMENT PROCESS

Interested parties involved in the development process may use the data in different ways and there may be varying views and interpretation of the factual data. Local Authority staff may have a view on contamination and human health and the wider environment. The Environment Agency are concerned principally with the protection of Controlled waters. Building insurers, funders and purchasers may be primarily concerned with issues of potential commercial blight. Purchasers are also not always fully informed, and perceptions on issues associated with risk can affect the decision to purchase. Developers and construction organisations will focus on financial aspects of dealing with the contamination in the context of the development and construction programme.

RISKS & LIABILITIES FROM CONTAMINATION

In simple terms, risks associated with contamination may be considered in terms of 1) statutory risks and 2) development related risks. If contamination is severe or forms a potential hazard based on its potential to affect groundwater, surface water or human health, a statutory risk may be present, and as such, if the risk is not reduced, criminal proceedings may be instigated by a government body or local authority.

If the contamination is less severe or not considered to be mobile, it may be considered a commercial liability which could, in theory remain untreated, but which may at a later date affect the value of the property, or, with changing legislation, become a statutory risk. Commercial liabilities could give rise to civil proceedings by third parties if there are grounds for action.

♣Solmek conditions of offer, notes on limitations & basis for contract (ref: version1/2023)

These conditions accompany our tender and supercede any previous conditions issued. Solmek will prepare a report solely for the use of the Client (the party invoiced) and its agent(s). No reliance should be placed on the contents of this report, in whole or in part by 3rd parties. The report, its content and format and associated data are copyright, and the property of Solmek. Photocopying of part or all of the contents, transfer or reproduction of any kind is forbidden without written permission from Solmek. A charge may be levied against such approval, the same to be made at the discretion of Solmek.

Solmek cannot be held liable and do not warrant, or otherwise guarantee the validity of information provided by third parties and subsequently used in our reports. Solmek are not responsible for the action negligent of otherwise of subcontractors or third parties.

Site investigation is a process of sampling. The scope and size of an investigation may be considered proportional to levels of confidence regarding the ground and groundwater conditions. The exploratory holes undertaken investigate only a small volume of the ground in relation to the overall size of the site, and can only provide a general indication of site conditions. The opinions provided and recommendations given in this report are based on the ground conditions as encountered within each of the exploratory holes. There may be different ground conditions elsewhere on the site which have not been identified by this investigation and which therefore have not been taken into account in this report. Reports are generally subject to the comments of the local authority and Environment Agency. The comments made on groundwater conditions are based on observations made at the time that site work was carried out. It should be noted that mobile contamination, ground gas levels and groundwater levels may vary owing to seasonal, tidal and/or weather related effects. Solmek cannot be held liable for any unrecorded or unforeseen obstructions between exploratory boreholes and trial pits. This includes instances where previous structures on the site (buried man made structures) or the presence of boulder clay (cobbles and/or boulder obstructions) have been anticipated. All types of piling operations should make allowance for obstructions within the construction budget to accommodate this. Unrecorded ancient mining may occur anywhere where seams that have been worked and influence the rock and soil above. Dissolution cavities can occur where gypsum or chalk is present. Rotary drilling is the recommended technique to prove the integrity of the rock.

Where the scope of the investigation is limited via access to information, time constraints, equipment limitations, testing, interpretation or by the client or his agents budgetary constraints, elements not set out in the proposal and excluded from the report are deemed to be omitted from the scope of the investigation.

Desk studies are generally prepared in accordance with RICS guidelines. Environmental site investigations are generally undertaken as 'exploratory investigations' in accordance with the definitions provided in paragraph 5.4 of BS 10175:2011 in order to confirm the conceptual assumptions. You are advised to familiarize yourself with the typical scope of such an investigation. No pumping of water will be undertaken unless a licence or facilities/equipment have been arranged by others.

Where the type, number or/and depth of exploratory hole is specified by others, Solmek cannot and will not be responsible for any subsequent shortfall or inadequacy in data, and any consequent shortfall in interpretation of environmental and geotechnical aspects which may be required at a later date in order to facilitate the design of permanent or temporary works.

All information acquired by Solmek in the course of investigation is the property of Solmek, and, only also becomes the joint property of the Client only on the complete settlement of all invoices relating to the project. Solmek reserve the right to use the information in commercial tendering and marketing, unless the Client expressly wishes otherwise in writing. The quoted rates do not include VAT, and payment terms are 30 days from dispatch of invoice from our offices. Quotes are subject to a site visit.

We have allowed for 1 mobilisation and normal working hours unless otherwise stated. The scope of the investigation may be reviewed following the desk study and/or fieldwork. The presence or otherwise of Japanese Knotweed or other invasive plants can be difficult to identify especially during winter months. If Japanese Knotweed or other invasive species are suspect, it should be confirmed by an ecologist. We have not allowed for acquiring services information, and cannot be responsible for damage to underground services or pipes not shown to us or not clearly shown on plans. Costs incurred will be passed on to you, and in commissioning Solmek you understand and accept that you/your agent have a contractual relationship with Solmek & you accept this. Our rates assume unobstructed, reasonably level and firm access to the exploratory positions and adequate clear working areas and headroom. We have priced on the basis that you or your client have the necessary permissions, wayleaves and approvals to access land. All boreholes and pits are backfilled with arisings except where gas monitoring pipes are installed with stopcock covers. Solmek are not responsible for any uneven surfaces as a result of siteworks and rutting and backfilled excavations may require re-levelling and/or making good by others after fieldwork is complete, and Solmek has not allowed for this. No price has been provided or requested for a return visit to remove pipework and covers. Hourly rates apply to consultancy only and do not include expenses unless otherwise shown. If warranties are required, legal costs incurred will be passed on to you assuming Solmek agree to complete such warranties, modified or otherwise and you understand and agree to pay all costs.

We reserve the right to pursue full payment of the invoice prior to release of any information including reports. We advise you/your client that we may elect to pursue our statutory rights under late payment legislation, and will apply 8% to the base rate for unreasonably late payments. Solmek are exempt from the CIS Scheme. Solmek offer to undertake work only in strict accordance with conditions covered by our current insurances, which are available for inspection. Solmek are not responsible for acts, negligent or otherwise of subcontractors and as a matter of policy cannot indemnify any other parties. Professional indemnity Insurance is limited to ten times the invoice net total except where stated otherwise by Solmek. Solmek give notice that consequential loss as a direct or indirect result of Solmek's activities or omission of the same are excluded.