

Section 3 – Licensing and future mining activity

Future underground mining

None recorded.

Coal mining licensing

None recorded within 200 metres of the enquiry boundary.

Court orders

None recorded.

Section 46 notices

No notices have been given, under section 46 of the Coal Mining Subsidence Act 1991, stating that the land is at risk of subsidence.

Withdrawal of support notices

The property is not in an area where a notice to withdraw support has been given.

The property is not in an area where a notice has been given under section 41 of the Coal Industry Act 1994, cancelling the entitlement to withdraw support.

Payments to owners of former copyhold land

The property is not in an area where a relevant notice has been published under the Coal Industry Act 1975/Coal Industry Act 1994.

Section 4 – Further information

The following potential risks have been identified and as part of your risk assessment should be investigated further.

Future development

If development proposals are being considered, technical advice relating to both the investigation of coal and former coal mines and their treatment should be obtained before beginning work on site. All proposals should apply specialist engineering practice required for former mining areas. No development should be undertaken that intersects, disturbs or interferes with any coal or coal mines without first obtaining the permission of the Coal Authority.

MINE GAS: Please note, if there are no recorded instances of mine gas within 500m of the enquiry boundary, this does not mean that mine gas is not present within the vicinity. The Coal Authority Mine Gas data is limited to only those sites where a Mine Gas incident has been recorded. Developers should be aware that the investigation of coal seams, mine workings or mine entries may have the potential to generate and/or displace underground gases. Associated risks both to the development site and any neighbouring land or properties should be fully considered when undertaking any ground works. The need for effective measures to prevent gases migrating onto any land or into any properties, either during investigation or remediation work, or after development must also be assessed and properly addressed. In these instances, the Coal Authority recommends that a more detailed Gas Risk Assessment is undertaken by a competent assessor.

Development advice

The site is within an area of historical coal mining activity. Should you require advice and/or support on understanding the mining legacy, its risks to your development or what next steps you need to take, please contact us.

Site investigations

The site is within an area of previous interest. It is close to where the Coal Authority has received information relating to past site investigations.

The site requires further investigation and may influence how you approach your risk assessment.

For further information on specific site or ground investigations in relation to any issues raised in Section 4, please call us on 0345 762 6848 or email us at groundstability@coal.gov.uk.

Section 5 – Data definitions

The datasets used in this report have limitations and assumptions within their results. For more guidance on the data and the results specific to the enquiry boundary, please **call us on 0345 762 6848** or **email us at groundstability@coal.gov.uk**.

Past underground coal mining

Details of all recorded underground mining relative to the enquiry boundary. Only past underground workings where the enquiry boundary is within 0.7 times the depth of the workings (zone of likely physical influence) allowing for seam inclination, will be included.

Probable unrecorded shallow workings

Areas where the Coal Authority believes there to be unrecorded coal workings that exist at or close to the surface (less than 30 metres deep).

Spine roadways at shallow depth

Connecting roadways either, working to working, or, surface to working, both in-seam and cross measures that exist at or close to the surface (less than 30 metres deep), either within or within 10 metres of the enquiry boundary.

Mine entries

Details of any shaft or adit either within, or within 100 metres of the enquiry boundary including approximate location, brief treatment details where known, the mineral worked from the mine entry and conveyance details where the mine entry has previously been sold by the Authority or its predecessors British Coal or the National Coal Board.

Abandoned mine plan catalogue numbers

Plan numbers extracted from the abandoned mines catalogue containing details of coal and other mineral abandonment plans deposited via the Mines Inspectorate in accordance with the Coal Mines Regulation Act and Metalliferous Mines Regulation Act 1872. A maximum of 9 plan extents that intersect with the enquiry boundary will be included. This does not infer that the workings and/or mine entries shown on the abandonment plan will be relevant to the site/property boundary.

Outcrops

Details of seam outcrops will be included where the enquiry boundary intersects with a conjectured or actual seam outcrop location (derived by either the British Geological Survey or the Coal Authority) or intersects with a defined 50 metres buffer on the coal (dip) side of the outcrop. An indication of whether the Coal Authority believes the seam to be of sufficient thickness and/or quality to have been worked will also be included.

Geological faults, fissures and breaklines

Geological disturbances or fractures in the bedrock. Surface fault lines (British Geological Survey derived data) and fissures and breaklines (Coal Authority derived data) intersecting with the enquiry boundary will be included. In some circumstances faults, fissures or breaklines have been known to contribute to surface subsidence damage as a consequence of underground coal mining.

Opencast mines

Opencast coal sites from which coal has been removed in the past by opencast (surface) methods and where the enquiry boundary is within 500 metres of either the licence area, site boundary, excavation area (high wall) or coaling area.

Coal Authority managed tips

Locations of disused colliery tip sites owned and managed by the Coal Authority, located within 500 metres of the enquiry boundary.

Site investigations

Details of site investigations within 50 metres of the enquiry boundary where the Coal Authority has received information relating to coal mining risk investigation and/or remediation by third parties.

Remediated sites

Sites where the Coal Authority has undertaken remedial works either within or within 50 metres of the enquiry boundary following report of a hazard relating to coal mining under the Coal Authority's Emergency Surface Hazard Call Out procedures.

Coal mining subsidence

Details of alleged coal mining subsidence claims made since 31 October 1994 either within or within 50 metres of the enquiry boundary. Where the claim relates to the enquiry boundary confirmation of whether the claim was accepted, rejected or whether liability is still being determined will be given. Where the claim has been discharged, whether this was by repair, payment of compensation or a combination of both, the value of the claim, where known, will also be given.

Details of any current 'Stop Notice' deferring remedial works or repairs affecting the property/site, and if so the date of the notice.

Details of any request made to execute preventative works before coal is worked under section 33 of the Coal Mining Subsidence Act 1991. If yes, whether any person withheld consent or failed to comply with any request to execute preventative works.

Mine gas

Reports of alleged mine gas emissions received by the Coal Authority, either within or within 500 metres of the enquiry boundary that subsequently required investigation and action by the Coal Authority to mitigate the effects of the mine gas emission. Please note, if there are no recorded instances of mine gas reported, this does not mean that mine gas is not present within the vicinity. The Coal Authority Mine Gas data is limited to only those sites where a Mine Gas incident has been recorded.

Mine water treatment schemes

Locations where the Coal Authority has constructed or operates assets that remove pollutants from mine water prior to the treated mine water being discharged into the receiving water body.

These schemes are part of the UK's strategy to meet the requirements of the Water Framework Directive. Schemes fall into 2 basic categories: Remedial – mitigating the impact of existing pollution or Preventative – preventing a future pollution incident.

Mine water treatment schemes generally consist of one or more primary settlement lagoons and one or more reed beds for secondary treatment. A small number are more specialised process treatment plants.

Future underground mining

Details of all planned underground mining relative to the enquiry boundary. Only those future workings where the enquiry boundary is within 0.7 times the depth of the workings (zone of likely physical influence) allowing for seam inclination will be included.

Coal mining licensing

Details of all licenses issued by the Coal Authority either within or within 200 metres of the enquiry boundary in relation to the under taking of surface coal mining, underground coal mining or underground coal gasification.

Court orders

Orders in respect of the working of coal under the Mines (Working Facilities and Support) Acts of 1923 and 1966 or any statutory modification or amendment thereof.

Section 46 notices

Notice of proposals relating to underground coal mining operations that have been given under section 46 of the Coal Mining Subsidence Act 1991.

Withdrawal of support notices

Published notices of entitlement to withdraw support and the date of the notice. Details of any revocation notice withdrawing the entitlement to withdraw support given under Section 41 of the Coal Industry Act 1994.

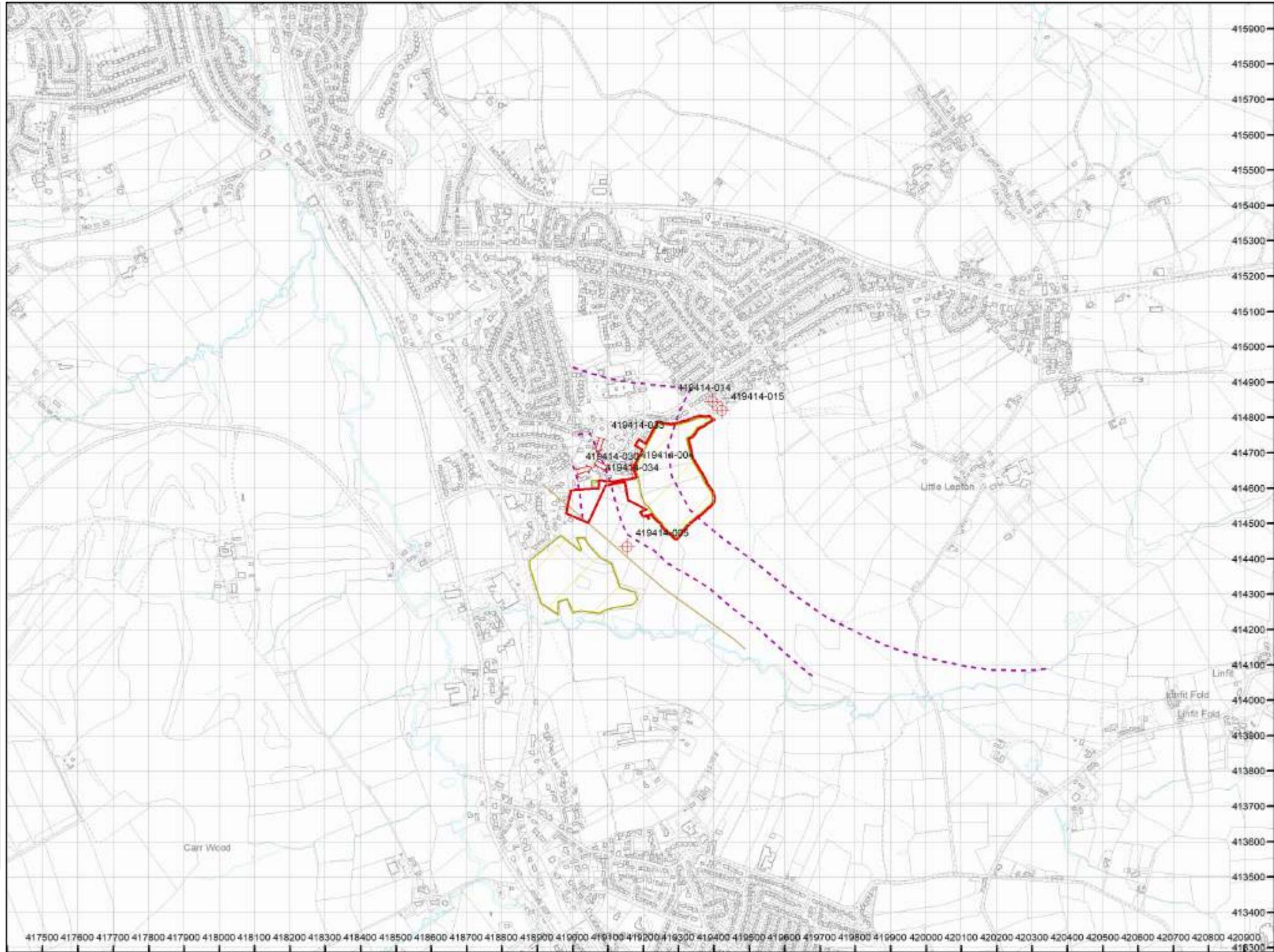
Payment to owners of former copyhold land

Relevant notices which may affect the property and any subsequent notice of retained interests in coal and coal mines, acceptance or rejection notices and whether any compensation has been paid to a claimant.

The map highlights any specific surface or subsurface features within or near to the boundary of the site.

Key

- Approximate position of the enquiry boundary shown 
- Disused mine shaft 
- Disused adit 
- Outcrop (Conjectured) 
- Geological faults 
- Site investigations 



How to contact us
0345 762 6848 (UK)
+44 (0)1623 637 000 (International)
www.groundstability.com

APPENDIX C

Risk Assessment Methodology



Qualitative Risk Assessment Methodology

The approach adopted by Sirius for the qualitative assessment of risk is based upon that given in Annex 4 of NHBC-Environment Agency-CIEH “Guidance for the Safe Development of Housing on Land Affected by Contamination” (2008) and is consistent with other current guidance.

The risk posed by viable contaminant linkages is based upon the consideration of both:

- a) the magnitude of the potential consequence (i.e. its severity); and,
- b) the probability (likelihood) of that consequence being realised.

The classifications used in this report for consequence and probability are given in Tables 1 and 2, respectively. The derived risk classifications are defined in Table 3.

Where there is no viable contaminant linkage there is no potential risk.

Table 1. Classification of Consequence

Classification	Definition
Severe	<p>Contaminant concentrations at the receptor that are likely to result in “significant harm” to human health (as defined in Part 2A of the Environmental Protection Act 1990).</p> <p>Major pollution of controlled waters that could have persistent and/or extensive effects on water quality, for example fish kills, closure of an abstraction, or substantial deterioration in quality of the receiving water body.</p> <p>Major impact on receptor amenity value or major damage to agriculture or commerce.</p> <p>Major damage to an ecosystem that is likely to result in a substantial adverse change in its functioning or harm to a species of special interest that endangers the long-term maintenance of the population.</p> <p>Catastrophic damage to crops, buildings or property.</p>
Medium	<p>Elevated concentrations at the receptor that might result in “significant harm” to human health (as defined in Part 2A of the Environmental Protection Act 1990).</p> <p>A pollution incident that has significant effect on water quality or abstraction potential.</p> <p>An incident that has a marked effect on receptor amenity value, agriculture or commerce.</p> <p>Damage to an ecosystem that may result in a substantial adverse change in its functioning or harm to a species of special interest that may endanger the long-term maintenance of the population.</p> <p>Significant damage to crops, buildings or property.</p>



Classification	Definition
Mild	<p>Potential human health impact at the receptor point but unlikely to be classified as “significant harm” (as defined in Part 2A of the Environmental Protection Act 1990).</p> <p>Pollution of water that will have a small or short-lived effect on water quality and marginal effects on its amenity or resource value or its use in agriculture or commerce.</p> <p>Minor or short-lived damage to ecosystems, which is unlikely to result in a substantial adverse change</p> <p>Minor damage to crops, buildings or property</p>
Minor	<p>No potential measurable detrimental human health impacts at the receptor point.</p> <p>Impact on water that will have no or minimal effect on water quality or use.</p> <p>No or minor and easily repairable effects on buildings, structures and services.</p>

Table 2. Classification of Probability

Classification	Definition
High	An impact is already occurring or is very likely in the short-term and almost inevitable over the long-term.
Medium	It is probable that an event would occur. This is not inevitable but possible in the short-term and likely over the long-term.
Low	Circumstances are possible under which an event could occur. However, it is by no means certain that an event will take place, even over the long-term.
Unlikely	Circumstances are such that it is improbable that an event would occur even over the very long-term.

Table 3. Risk Classification

Probability	Consequence			
	<i>Severe</i>	<i>Medium</i>	<i>Mild</i>	<i>Minor</i>
<i>High</i>	Very High	High	Moderate	Low
<i>Medium</i>	High	Moderate	Low to Moderate	Low
<i>Low</i>	Moderate	Low to Moderate	Low	Very Low
<i>Unlikely</i>	Low to Moderate	Low	Very Low	Negligible



Table 4 provides a context for interpretation of the risk classification categories. The definitions provided are based on those given in CIRIA (2001) "Contaminated Land Risk Assessment. A Guide to Good Practice", Report C552.

Table 4. Interpretation of Risk Classification Categories

Risk Classification	Definition
Very High	There is a high probability that severe harm to one or more identified receptors could occur or there is evidence that this is already happening. This risk is likely to result in a substantial liability. Urgent investigation and remediation are likely to be required.
High	Harm is likely to be caused to one or more identified receptors. Realisation of the risk is likely to present a substantial liability. Urgent investigation is required and remedial works may be necessary in the short-term and are likely over the longer term.
Moderate	It is possible that harm could be caused to one or more identified receptors. However, it is relatively unlikely that such harm would be severe. Investigation is normally required to clarify the risk and to determine the potential liability. Some remedial works may be required in the longer term.
Low	It is possible that harm could be caused to one or more identified receptors but it is likely that this harm, if realised, would normally be mild. No further investigation is considered necessary to assess risk or environmental liability but investigations could be undertaken if desired to confirm 'baseline' conditions for the purposes of liability management. Remedial works are unlikely to be required.
Very Low	There is a low probability that harm could be caused to one or more identified receptors. In the event of such harm being realised, it is likely to be mild, at worst. No further investigation is considered necessary to assess risk or environmental liability but investigations could be undertaken if desired to confirm 'baseline' conditions for the purposes of liability management. Remedial works are very unlikely to be required.
Negligible	It is unlikely that harm could be caused to one or more identified receptors. In the event of harm being realised, it is likely to be minor. No further investigation is considered necessary to assess risk or environmental liability. Remedial works are not expected.

APPENDIX D

Fieldwork Information



BOREHOLE RECORD

BH No. **BH100**
Sheet 1 of 1

Site: Hermitage Park, Lepton

Contract No: C10281

Client: Miller Homes

Date(s):
25/10/2024

Method: Open rotary hole drilling

Scale: 1:150

SAMPLE DETAILS

STRATA RECORD

Logged By: Driller Checked By: GH

Driller: SDS

Depth From - To(m)	TCR	SCR	RQD	FI	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Well
						OVERBURDEN (DRILLER'S DESCRIPTION).				
1										
2						SANDSTONE (DRILLER'S DESCRIPTION).	1.50	138.70		
3										
4						Dark MUDSTONE with COAL trace (DRILLER'S DESCRIPTION).	3.40	136.80		
						Grey MUDSTONE (DRILLER'S DESCRIPTION).	3.50	136.70		
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17						Dark MUDSTONE with COAL trace (DRILLER'S DESCRIPTION).	17.00	123.20		
18						Grey MUDSTONE with SANDSTONE bands (DRILLER'S DESCRIPTION).	17.30	122.90		
19										
20										
21										
22										
23										
24										
25										
26										
27										
28										
29						COAL (DRILLER'S DESCRIPTION).	28.60	111.60		
						Grey MUDSTONE (DRILLER'S DESCRIPTION).	29.00	111.20		
30						End of Borehole at 30.00m	30.00	110.20		

Remarks and Groundwater Observations:

1. Borehole complete at 30.00m bgl. 2. Drilled using water flush. 3. Logged based on arisings from the borehole during drilling. 4. Backfilled with gravel and sealed with bentonite upon completion.

GL (m AOD)
140.20

Eastings:
419308.50

Northings:
414772.00

Fig No.

BH100



BOREHOLE RECORD

BH No. **BH101**
Sheet 1 of 1

Site: Hermitage Park, Lepton

Contract No: C10281

Client: Miller Homes

Date(s):
25/10/2024

Method: Open rotary hole drilling

Scale: 1:150

SAMPLE DETAILS

STRATA RECORD

Logged By: Driller Checked By: GH

Driller: SDS

Depth From - To(m)	TCR	SCR	RQD	FI	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Well
						OVERBURDEN (DRILLER'S DESCRIPTION).				
1										
2						SANDSTONE (DRILLER'S DESCRIPTION).	1.60	136.36		
3										
4										
5						Dark MUDSTONE with COAL TRACE (DRILLER'S DESCRIPTION).	5.00	132.96		
6						Grey MUDSTONE(DRILLER'S DESCRIPTION).	5.10	132.86		
7										
8										
9										
10										
11										
12										
13										
14										
15						Dark MUDSTONE with COAL trace (DRILLER'S DESCRIPTION).	15.00	122.96		
16						Grey MUDSTONE with SANDSTONE bands (DRILLER'S DESCRIPTION).	15.20	122.76		
17										
18										
19										
20										
21										
22										
23										
24						Grey MUDSTONE (DRILLER'S DESCRIPTION).	24.00	113.96		
25										
26										
27										
28						Dark MUDSTONE with COAL trace (DRILLER'S DESCRIPTION).	28.00	109.96		
29						Grey MUDSTONE (DRILLER'S DESCRIPTION).	28.30	109.66		
30						End of Borehole at 30.00m	30.00	107.96		

Remarks and Groundwater Observations:

1. Borehole complete at 30.00m bgl. 2. Drilled using water flush. 3. Logged based on arisings from the borehole during drilling. 4. Backfilled with gravel and sealed with bentonite upon completion.

GL (m AOD)
137.96
Eastings:
419261.10
Northings:
414763.70

Fig No.

BH101



BOREHOLE RECORD

BH No. **BH102**
Sheet 1 of 1

Site: Hermitage Park, Lepton

Contract No: C10281

Client: Miller Homes

Date(s):
24/10/2024

Method: Open rotary hole drilling

Scale: 1:150

SAMPLE DETAILS

STRATA RECORD

Logged By: Driller Checked By: GH

Driller: SDS

Depth From - To(m)	TCR	SCR	RQD	FI	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Well
						OVERBURDEN (DRILLER'S DESCRIPTION).				
1										
2						SANDSTONE (DRILLER'S DESCRIPTION).	2.00	134.36		
3										
4										
5										
6										
7						Grey MUDSTONE (DRILLER'S DESCRIPTION).	7.00	129.36		
8										
9										
10										
11						Dark MUDSTONE with COAL trace (DRILLER'S DESCRIPTION).	10.50	125.86		
12						Grey MUDSTONE (DRILLER'S DESCRIPTION).	10.80	125.56		
13										
14										
15										
16						SANDSTONE (DRILLER'S DESCRIPTION).	16.00	120.36		
17										
18										
19										
20						Grey MUDSTONE with SANDSTONE bands (DRILLER'S DESCRIPTION).	20.00	116.36		
21										
22										
23						COAL (DRILLER'S DESCRIPTION).	23.00	113.36		
24						Grey MUDSTONE (DRILLER'S DESCRIPTION).	23.50	112.86		
25						End of Borehole at 25.00m	25.00	111.36		
26										
27										
28										
29										
30										

Remarks and Groundwater Observations:
 1. Borehole complete at 25.00m bgl. 2. Drilled using water flush. 3. Logged based on arisings from the borehole during drilling. 4. Backfilled with gravel and sealed with bentonite upon completion.

GL (m AOD)
136.36
Eastings:
419241.70
Northings:
414735.90

Fig No.
BH102



BOREHOLE RECORD

BH No. **BH103**
Sheet 1 of 1

Site: Hermitage Park, Lepton

Contract No: C10281

Client: Miller Homes

Date(s):
24/10/2024

Method: Open rotary hole drilling

Scale: 1:150

SAMPLE DETAILS

STRATA RECORD

Logged By: Driller Checked By: GH

Driller: SDS

Depth From - To(m)	TCR	SCR	RQD	FI	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Well
						OVERBURDEN (DRILLER'S DESCRIPTION).				
1										
2						SANDSTONE (DRILLER'S DESCRIPTION).	1.50	133.35		
3										
4										
5										
6										
7										
8										
9						Grey MUDSTONE (DRILLER'S DESCRIPTION).	9.00	125.85		
10										
11										
12										
13										
14										
15										
16										
17										
18						SANDSTONE (DRILLER'S DESCRIPTION).	18.00	116.85		
19										
20						Grey MUDSTONE (DRILLER'S DESCRIPTION).	20.00	114.85		
21						SOFT/PART RETURNS (DRILLER'S DESCRIPTION).	21.00	113.85		
22						Grey MUDSTONE with PART RETURNS (DRILLER'S DESCRIPTION).	21.70	113.15		
23						End of Borehole at 23.00m	23.00	111.85		
24										
25										
26										
27										
28										
29										
30										

Remarks and Groundwater Observations:
1. Borehole complete at 23.00m bgl. 2. Drilled using water flush. 3. Logged based on arisings from the borehole during drilling. 4. Backfilled with gravel and sealed with bentonite upon completion.

GL (m AOD)
134.85
Eastings:
419222.10
Northings:
414708.00

Fig No.

BH103



BOREHOLE RECORD

BH No. **BH104**
Sheet 1 of 1

Site: Hermitage Park, Lepton

Contract No: C10281

Client: Miller Homes

Date(s):
24/10/2024

Method: Open rotary hole drilling

Scale: 1:150

SAMPLE DETAILS

STRATA RECORD

Logged By: Driller Checked By: GH

Driller: SDS

Depth From - To(m)	TCR	SCR	RQD	FI	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Well
						OVERBURDEN (DRILLER'S DESCRIPTION).				
1										
2						Grey MUDSTONE with SANDSTONE bands (DRILLER'S DESCRIPTION).	1.50	135.67		
3										
4										
5										
6										
7										
8						Dark MUDSTONE with COAL trace (DRILLER'S DESCRIPTION).	8.00	129.17		
9						Grey MUDSTONE (DRILLER'S DESCRIPTION).	8.40	128.77		
10										
11										
12						SANDSTONE (DRILLER'S DESCRIPTION).	12.00	125.17		
13										
14										
15										
16										
17										
18						Grey MUDSTONE(DRILLER'S DESCRIPTION).	18.00	119.17		
19										
20										
21										
22										
23										
24										
25						COAL (DRILLER'S DESCRIPTION).	24.50	112.67		
26						Grey MUDSTONE with SANDSTONE bands (DRILLER'S DESCRIPTION).	25.00	112.17		
27										
28										
29										
30						End of Borehole at 30.00m	30.00	107.17		

Remarks and Groundwater Observations:
 1. Borehole complete at 30.00m bgl. 2. Drilled using air flush. 3. Logged based on arisings from the borehole during drilling. 4. Installed with gas/groundwater monitoring well, as detailed above.

GL (m AOD)
137.17
Eastings:
419269.30
Northings:
414716.50

Fig No.

BH104



BOREHOLE RECORD

BH No. **BH105**
Sheet 1 of 1

Site: Hermitage Park, Lepton

Contract No: C10281

Client: Miller Homes

Date(s):
25/10/2024

Method: Open rotary hole drilling

Scale: 1:150

SAMPLE DETAILS

STRATA RECORD

Logged By: Driller Checked By: GH

Driller: SDS

Depth From - To(m)	TCR	SCR	RQD	FI	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Well
						OVERBURDEN (DRILLER'S DESCRIPTION).				
						Dark MUDSTONE with COAL trace (DRILLER'S DESCRIPTION).	3.00	136.62		
						Grey MUDSTONE (DRILLER'S DESCRIPTION).	3.10	136.52		



BOREHOLE RECORD

BH No. **BH106**
Sheet 1 of 1

Site: Hermitage Park, Lepton

Contract No: C10281

Client: Miller Homes

Date(s):
24/10/2024

Method: Open rotary hole drilling

Scale: 1:150

SAMPLE DETAILS

STRATA RECORD

Logged By: Driller Checked By: GH

Driller: SDS

Depth From - To(m)	TCR	SCR	RQD	FI	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Well
						OVERBURDEN (DRILLER'S DESCRIPTION).				
1										
2						SANDSTONE and MUDSTONE bands (DRILLERS DESCRIPTION).	1.50	132.66		
3										
4										
5										
6										
7						COAL (DRILLER'S DESCRIPTION).	6.50	127.66		
8						Grey MUDSTONE (DRILLER'S DESCRIPTION).	7.30	126.86		
9						Dark MUDSTONE with COAL trace (DRILLER'S DESCRIPTION).	9.00	125.16		
10						Grey MUDSTONE (DRILLER'S DESCRIPTION).	9.20	124.96		
11										
12										
13										
14										
15										
16										
17										
18										
19										
20						COAL (DRILLER'S DESCRIPTION).	20.00	114.16		
21						Grey MUDSTONE (DRILLER'S DESCRIPTION).	20.40	113.76		
22						End of Borehole at 22.00m	22.00	112.16		
23										
24										
25										
26										
27										
28										
29										
30										

Remarks and Groundwater Observations:
 1. Borehole complete at 22.00m bgl. 2. Drilled using water flush. 3. Logged based on arisings from the borehole during drilling. 4. Backfilled with gravel and sealed with bentonite upon completion.

GL (m AOD)
134.16
 Eastings:
419202.70
 Northings:
414680.40

Fig No.
BH106



BOREHOLE RECORD

BH No. **BH107**
Sheet 1 of 1

Site: Hermitage Park, Lepton

Contract No: C10281

Client: Miller Homes

Date(s):
24/10/2024

Method: Open rotary hole drilling

Scale: 1:150

SAMPLE DETAILS

STRATA RECORD

Logged By: Driller Checked By: GH

Driller: SDS

Depth From - To(m)	TCR	SCR	RQD	FI	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Well
						OVERBURDEN (DRILLER'S DESCRIPTION).				
1										
2						Grey MUDSTONE (DRILLER'S DESCRIPTION).	1.50	134.25		
3										
4										
5										
6										
7										
8						Dark MUDSTONE with COAL trace (DRILLER'S DESCRIPTION).	8.00	127.75		
9						Grey MUDSTONE (DRILLER'S DESCRIPTION).	8.20	127.55		
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23						BROKEN GROUND / NO RETURNS	22.40	113.35		
24						HARD STRATA / NO RETURNS (DRILLER'S DESCRIPTION).	23.00	112.75		
25										
26										
27						End of Borehole at 27.00m	27.00	108.75		
28										
29										
30										

Remarks and Groundwater Observations:
1. Borehole complete at 27.00m bgl. 2. Drilled using air flush. 3. Logged based on arisings from the borehole during drilling. 4. Backfilled with arisings and sealed with bentonite upon completion.

GL (m AOD)
135.75
Eastings:
419249.60
Northings:
414688.60

Fig No.

BH107



BOREHOLE RECORD

BH No. **BH108**
Sheet 1 of 1

Site: Hermitage Park, Lepton

Contract No: C10281

Client: Miller Homes

Date(s):
25/10/2024

Method: Open rotary hole drilling

Scale: 1:150

SAMPLE DETAILS

STRATA RECORD

Logged By: Driller Checked By: GH

Driller: SDS

Depth From - To(m)	TCR	SCR	RQD	FI	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Well
						OVERBURDEN (DRILLER'S DESCRIPTION).				
1										
2						SANDSTONE (DRILLER'S DESCRIPTION).	1.50	136.56		
3										
4										
5										
6						Grey MUDSTONE (DRILLER'S DESCRIPTION).	6.00	132.06		
7										
8										
9						Dark MUDSTONE with COAL trace (DRILLER'S DESCRIPTION).	9.00	129.06		
10						Grey MUDSTONE (DRILLER'S DESCRIPTION).	9.30	128.76		
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23										
24										
25										
26										
27						SOFT/PART RETURNS (DRILLER'S DESCRIPTION).	26.50	111.56		
28						Grey MUDSTONE/PART RETURNS (DRILLER'S DESCRIPTION).	27.00	111.06		
29										
30						End of Borehole at 30.00m	30.00	108.06		

Remarks and Groundwater Observations:
1. Borehole complete at 30.00m bgl. 2. Drilled using air flush. 3. Logged based on arisings from the borehole during drilling. 4. Backfilled with arisings and sealed with bentonite upon completion.

GL (m AOD)
138.06
Eastings:
419297.10
Northings:
414696.90

Fig No.
BH108



BOREHOLE RECORD

BH No. **BH109**
Sheet 1 of 1

Site: Hermitage Park, Lepton

Contract No: C10281

Client: Miller Homes

Date(s):
24/10/2024

Method: Open rotary hole drilling

Scale: 1:150

SAMPLE DETAILS

STRATA RECORD

Logged By: Driller Checked By: GH

Driller: SDS

Depth From - To(m)	TCR	SCR	RQD	FI	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Well
						OVERBURDEN (DRILLER'S DESCRIPTION).				
					1					
					2	SANDSTONE (DRILLER'S DESCRIPTION).	1.50	130.20		
					3					
					4	Dark MUDSTONE with COAL trace (DRILLER'S DESCRIPTION).	3.50	128.20		
					4	Grey MUDSTONE (DRILLER'S DESCRIPTION).	4.10	127.60		
					5					
					6	Dark MUDSTONE with COAL trace (DRILLER'S DESCRIPTION).	6.00	125.70		
					7	Grey MUDSTONE with SANDSTONE bands (DRILLER'S DESCRIPTION).	6.20	125.50		
					8					
					9					
					10					
					11					
					12					
					13					
					14					
					15					
					16					
					17	COAL (DRILLER'S DESCRIPTION).	17.00	114.70		
					18	Grey MUDSTONE (DRILLER'S DESCRIPTION).	17.70	114.00		
					19					
					20	End of Borehole at 20.00m	20.00	111.70		
					21					
					22					
					23					
					24					
					25					
					26					
					27					
					28					
					29					
					30					

Remarks and Groundwater Observations:
 1. Borehole complete at 20.00m bgl. 2. Drilled using water flush. 3. Logged based on arisings from the borehole during drilling. 4. Installed with gas/groundwater monitoring well, as detailed above.

GL (m AOD)
131.70
Eastings:
419187.70
Northings:
414653.00

Fig No.
BH109



BOREHOLE RECORD

BH No. **BH110**
Sheet 1 of 1

Site: Hermitage Park, Lepton

Contract No: C10281

Client: Miller Homes

Date(s):
24/10/2024

Method: Open rotary hole drilling

Scale: 1:150

SAMPLE DETAILS

STRATA RECORD

Logged By: Driller Checked By: GH

Driller: SDS

Depth From - To(m)	TCR	SCR	RQD	FI	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Well
						OVERBURDEN (DRILLER'S DESCRIPTION).				
1										
2						Grey MUDSTONE (DRILLER'S DESCRIPTION).	1.60	133.64		
3										
4										
5										
6						Dark MUDSTONE with COAL trace (DRILLER'S DESCRIPTION).	6.00	129.24		
7						Grey MUDSTONE (DRILLER'S DESCRIPTION).	6.20	129.04		
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18						SANDSTONE (DRILLER'S DESCRIPTION).	18.00	117.24		
19										
20						SOFT/PART RETURNS (DRILLER'S DESCRIPTION).	20.00	115.24		
21						Grey MUDSTONE with SANDSTONE BANDS (DRILLER'S DESCRIPTION).	20.70	114.54		
22										
23										
24										
25										
26										
27										
28										
29										
30						End of Borehole at 30.00m	30.00	105.24		

Remarks and Groundwater Observations:
1. Borehole complete at 30.00m bgl. 2. Drilled using air flush. 3. Logged based on arisings from the borehole during drilling. 4. Backfilled with arisings and sealed with bentonite upon completion.

GL (m AOD)
135.24
Eastings:
419230.30
Northings:
414660.80

Fig No.

BH110



BOREHOLE RECORD

BH No. **BH111**
Sheet 1 of 1

Site: Hermitage Park, Lepton

Contract No: C10281

Client: Miller Homes

Date(s):
24/10/2024

Method: Open rotary hole drilling

Scale: 1:150

SAMPLE DETAILS

STRATA RECORD

Logged By: Driller Checked By: GH

Driller: SDS

Depth From - To(m)	TCR	SCR	RQD	FI	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Well
						OVERBURDEN (DRILLER'S DESCRIPTION).				
1										
2						SANDSTONE (DRILLER'S DESCRIPTION).	2.00	134.77		
3										
4										
5										
6										
7						Grey MUDSTONE with SANDSTONE bands (DRILLER'S DESCRIPTION).	7.00	129.77		
8										
9										
10						Dark MUDSTONE with COAL trace (DRILLER'S DESCRIPTION).	10.00	126.77		
11						Grey MUDSTONE (DRILLER'S DESCRIPTION).	10.30	126.47		
12										
13										
14										
15										
16										
17						SANDSTONE (DRILLER'S DESCRIPTION).	17.00	119.77		
18										
19										
20						Grey MUDSTONE with SANDSTONE bands (DRILLER'S DESCRIPTION).	20.00	116.77		
21										
22										
23										
24						BROKEN GROUND / NO RETURNS (DRILLER'S DESCRIPTION).	24.00	112.77		
25						HARD STRATA / NO RETURNS (DRILLER'S DESCRIPTION).	24.70	112.07		
26										
27						End of Borehole at 27.00m	27.00	109.77		
28										
29										
30										

Remarks and Groundwater Observations:

1. Borehole complete at 27.00m bgl. 2. Drilled using air flush. 3. Logged based on arisings from the borehole during drilling. 4. Installed with gas/groundwater monitoring well, as detailed above.

GL (m AOD)
136.77

Eastings:
419277.50

Northings:
414668.90

Fig No.

BH111



BOREHOLE RECORD

BH No. **BH112**
Sheet 1 of 1

Site: Hermitage Park, Lepton

Contract No: C10281

Client: Miller Homes

Date(s):
25/10/2024

Method: Open rotary hole drilling

Scale: 1:150

SAMPLE DETAILS

STRATA RECORD

Logged By: Driller Checked By: GH

Driller: SDS

Depth From - To(m)	TCR	SCR	RQD	FI	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Well
						OVERBURDEN (DRILLER'S DESCRIPTION).				
1										
2										
3						SANDSTONE (DRILLER'S DESCRIPTION).	2.30	137.26		
4										
5										
6										
7										
8						Grey MUDSTONE (DRILLER'S DESCRIPTION).	8.00	131.56		
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19						SANDSTONE (DRILLER'S DESCRIPTION).	19.00	120.56		
20										
21						Grey MUDSTONE with SANDSTONE BANDS (DRILLER'S DESCRIPTION).	21.00	118.56		
22										
23										
24										
25										
26										
27						BROKEN GROUND / NO RETURNS (DRILLER'S DESCRIPTION).	27.00	112.56		
28						SOFT/ NO RETURNS (DRILLER'S DESCRIPTION).	27.80	111.76		
29										
30						End of Borehole at 30.00m	30.00	109.56		

Remarks and Groundwater Observations:
1. Borehole complete at 30.00m bgl. 2. Drilled using air flush. 3. Logged based on arisings from the borehole during drilling. 4. Backfilled with arisings and sealed with bentonite upon completion.

GL (m AOD)
139.56
Eastings:
419324.90
Northings:
414677.40

Fig No.

BH112



BOREHOLE RECORD

BH No. **BH113**
Sheet 1 of 1

Site: Hermitage Park, Lepton

Contract No: C10281

Client: Miller Homes

Date(s):
23/10/2024

Method: Open rotary hole drilling

Scale: 1:150

SAMPLE DETAILS

STRATA RECORD

Logged By: Driller Checked By: GH

Driller: SDS

Depth From - To(m)	TCR	SCR	RQD	FI	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Well
						OVERBURDEN (DRILLER'S DESCRIPTION).				
1						SANDSTONE (DRILLER'S DESCRIPTION).	1.00	131.68		
2										
3										
4										
5						Dark MUDSTONE with COAL trace (DRILLER'S DESCRIPTION).	4.70	127.98		
						Grey MUDSTONE (DRILLER'S DESCRIPTION).	5.00	127.68		
6										
7										
8										
9										
10										
11										
12						Grey MUDSTONE with SANDSTONE bands (DRILLER'S DESCRIPTION).	12.00	120.68		
13										
14										
15										
16										
17										
18						COAL (DRILLER'S DESCRIPTION).	18.00	114.68		
						Grey MUDSTONE (DRILLER'S DESCRIPTION).	18.50	114.18		
19										
20										
21						End of Borehole at 21.00m	21.00	111.68		
22										
23										
24										
25										
26										
27										
28										
29										
30										

Remarks and Groundwater Observations:
1. Borehole complete at 21.00m bgl. 2. Drilled using air flush. 3. Logged based on arisings from the borehole during drilling. 4. Backfilled with arisings and sealed with bentonite upon completion.

GL (m AOD)
132.68
Eastings:
419206.10
Northings:
414624.30

Fig No.

BH113



BOREHOLE RECORD

BH No. **BH114**
Sheet 1 of 1

Site: Hermitage Park, Lepton

Contract No: C10281

Client: Miller Homes

Date(s):
25/10/2024

Method: Open rotary hole drilling

Scale: 1:150

SAMPLE DETAILS

STRATA RECORD

Logged By: Driller Checked By: GH

Driller: SDS

Depth From - To(m)	TCR	SCR	RQD	FI	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Well
						OVERBURDEN (DRILLER'S DESCRIPTION).				
1						Grey MUDSTONE with SANDSTONE (DRILLER'S DESCRIPTION).	1.30	134.58		
2										
3										
4										
5										
6										
7										
8					Dark MUDSTONE with COAL trace (DRILLER'S DESCRIPTION).	8.00	127.88			
9					Grey MUDSTONE (DRILLER'S DESCRIPTION).	8.30	127.58			
10										
11										
12										
13										
14										
15										
16										
17										
17					SANDSTONE (DRILLER'S DESCRIPTION).	17.00	118.88			
18										
19										
20					Grey MUDSTONE (DRILLER'S DESCRIPTION).	20.00	115.88			
21										
22					COAL (DRILLER'S DESCRIPTION).	22.00	113.88			
23					Grey MUDSTONE (DRILLER'S DESCRIPTION).	22.50	113.38			
24										
25										
26										
27										
28										
29										
28.50					SANDSTONE (DRILLER'S DESCRIPTION).	28.50	107.38			
30					End of Borehole at 30.00m	30.00	105.88			

Remarks and Groundwater Observations:
1. Borehole complete at 30.00m bgl. 2. Drilled using air flush. 3. Logged based on arisings from the borehole during drilling. 4. Installed with gas/groundwater monitoring well, as detailed above.

GL (m AOD)
135.88
Eastings:
419257.80
Northings:
414641.40

Fig No.

BH114



BOREHOLE RECORD

BH No. **BH115**
Sheet 1 of 1

Site: Hermitage Park, Lepton

Contract No: C10281

Client: Miller Homes

Date(s):
25/10/2024

Method: Open rotary hole drilling

Scale: 1:150

SAMPLE DETAILS

STRATA RECORD

Logged By: Driller Checked By: GH

Driller: SDS

Depth From - To(m)	TCR	SCR	RQD	FI	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Well
						OVERBURDEN (DRILLER'S DESCRIPTION).				
1										
2						SANDSTONE (DRILLER'S DESCRIPTION).	2.20	135.93		
3										
4										
5										
6										
7										
8						Grey MUDSTONE (DRILLER'S DESCRIPTION).	8.00	130.13		
9										
10										
11										
12						Dark MUDSTONE with COAL TRACE (DRILLER'S DESCRIPTION).	11.70	126.43		
13						Grey MUDSTONE with SANDSTONE bands (DRILLER'S DESCRIPTION).	12.00	126.13		
14										
15										
16										
17										
18										
19										
20										
21										
22										
23										
24										
25										
26						SOFT / NO RETURNS (DRILLER'S DESCRIPTION).	25.50	112.63		
27						SOLID / NO RETURNS (DRILLER'S DESCRIPTION).	26.00	112.13		
28										
29										
30						End of Borehole at 30.00m	30.00	108.13		

Remarks and Groundwater Observations:

1. Borehole complete at 30.00m bgl. 2. Drilled using air flush. 3. Logged based on arisings from the borehole during drilling. 4. Backfilled with arisings and sealed with bentonite upon completion.

GL (m AOD)
138.13

Eastings:
419305.30

Northings:
414649.50

Fig No.

BH115



BOREHOLE RECORD

BH No. **BH116**
Sheet 1 of 1

Site: Hermitage Park, Lepton

Contract No: C10281

Client: Miller Homes

Date(s):
23/10/2024

Method: Open rotary hole drilling

Scale: 1:150

SAMPLE DETAILS

STRATA RECORD

Logged By: Driller Checked By: GH

Driller: SDS

Depth From - To(m)	TCR	SCR	RQD	FI	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Well
						OVERBURDEN (DRILLER'S DESCRIPTION).				
1							1.20	133.85		
2						SANDSTONE (DRILLER'S DESCRIPTION).				
3										
4										
5										
6										
7						Dark MUDSTONE with COAL trace (DRILLER'S DESCRIPTION).	6.70	128.35		
8						SANDSTONE (DRILLER'S DESCRIPTION).	7.00	128.05		
9										
10										
11										
12						Grey MUDSTONE (DRILLER'S DESCRIPTION).	12.00	123.05		
13										
14										
15										
16										
17										
18										
19										
20										
21						COAL (DRILLER'S DESCRIPTION).	20.80	114.25		
22						Grey MUDSTONE (DRILLER'S DESCRIPTION).	21.30	113.75		
23						End of Borehole at 23.00m	23.00	112.05		
24										
25										
26										
27										
28										
29										
30										

Remarks and Groundwater Observations:
1. Borehole complete at 23.00m bgl. 2. Drilled using air flush. 3. Logged based on arisings from the borehole during drilling. 4. Installed with gas/groundwater monitoring well, as detailed above.

GL (m AOD)
135.05
Eastings:
419238.40
Northings:
414613.50

Fig No.

BH116



BOREHOLE RECORD

BH No. **BH117**
Sheet 1 of 1

Site: Hermitage Park, Lepton

Contract No: C10281

Client: Miller Homes

Date(s):
23/10/2024

Method: Open rotary hole drilling

Scale: 1:150

SAMPLE DETAILS

STRATA RECORD

Logged By: Driller Checked By: GH

Driller: SDS

Depth From - To(m)	TCR	SCR	RQD	FI	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Well
						OVERBURDEN (DRILLER'S DESCRIPTION).				
1										
2						SANDSTONE (DRILLER'S DESCRIPTION).	1.50	134.94		
3										
4										
5										
6										
7										
8						Grey MUDSTONE (DRILLER'S DESCRIPTION).	8.00	128.44		
9						Dark MUDSTONE with COAL trace (DRILLER'S DESCRIPTION).	9.00	127.44		
10						Grey MUDSTONE with SANDSTONE bands (DRILLER'S DESCRIPTION).	9.30	127.14		
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23										
24						Dark MUDSTONE with COAL trace (DRILLER'S DESCRIPTION).	23.50	112.94		
						COAL (DRILLER'S DESCRIPTION).	23.80	112.64		
						Grey MUDSTONE (DRILLER'S DESCRIPTION).	24.00	112.44		
25										
26										
27										
28										
29										
30						End of Borehole at 30.00m	30.00	106.44		

Remarks and Groundwater Observations:

1. Borehole complete at 30.00m bgl. 2. Drilled using air flush. 3. Logged based on arisings from the borehole during drilling. 4. Backfilled with arisings and sealed with bentonite upon completion.

GL (m AOD)
136.44

Eastings:
419285.80

Northings:
414621.90

Fig No.

BH117



BOREHOLE RECORD

BH No. **BH118**
Sheet 1 of 1

Site: Hermitage Park, Lepton

Contract No: C10281

Client: Miller Homes

Date(s):
22/10/2024

Method: Open rotary hole drilling

Scale: 1:150

SAMPLE DETAILS

STRATA RECORD

Logged By: Driller Checked By: GH

Driller: SDS

Depth From - To(m)	TCR	SCR	RQD	FI	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Well
						OVERBURDEN (DRILLER'S DESCRIPTION).				
1						SANDSTONE (DRILLER'S DESCRIPTION).	1.00	132.25		
2										
3										
4										
5										
6										
7						Grey MUDSTONE with SANDSTONE bands (DRILLER'S DESCRIPTION).	7.00	126.25		
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19						SOFT / PART RETURNS (DRILLER'S DESCRIPTION).	18.50	114.75		
						Grey MUDSTONE / PART RETURNS (DRILLER'S DESCRIPTION).	19.00	114.25		
20						End of Borehole at 20.00m	20.00	113.25		
21										
22										
23										
24										
25										
26										
27										
28										
29										
30										

Remarks and Groundwater Observations:
1. Borehole complete at 20.00m bgl. 2. Drilled using air flush. 3. Logged based on arisings from the borehole during drilling. 4. Installed with gas/groundwater monitoring well, as detailed above.

GL (m AOD)
133.25
Eastings:
419219.00
Northings:
414585.80

Fig No.

BH118



BOREHOLE RECORD

BH No. **BH119**
Sheet 1 of 1

Site: Hermitage Park, Lepton

Contract No: C10281

Client: Miller Homes

Date(s):
22/10/2024

Method: Open rotary hole drilling

Scale: 1:150

SAMPLE DETAILS

STRATA RECORD

Logged By: Driller Checked By: GH

Driller: SDS

Depth From - To(m)	TCR	SCR	RQD	FI	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Well
						OVERBURDEN (DRILLER'S DESCRIPTION).				
1										
2						SANDSTONE (DRILLER'S DESCRIPTION).	1.50	134.23		
3										
4										
5										
6										
7						Grey MUDSTONE with SANDSTONE bands (DRILLER'S DESCRIPTION).	6.80	128.93		
8										
9										
10										
11										
12										
13										
14										
15						SANDSTONE (DRILLER'S DESCRIPTION).	15.00	120.73		
16										
17						Grey MUDSTONE with SANDSTONE bands (DRILLER'S DESCRIPTION).	17.00	118.73		
18										
19										
20										
21						COAL (DRILLER'S DESCRIPTION).	21.00	114.73		
22						Grey MUDSTONE (DRILLER'S DESCRIPTION).	21.40	114.33		
23										
24										
25										
26										
27										
28						SANDSTONE (DRILLER'S DESCRIPTION).	28.00	107.73		
29										
30						End of Borehole at 30.00m	30.00	105.73		

Remarks and Groundwater Observations:

1. Borehole complete at 30.00m bgl. 2. Drilled using air flush. 3. Logged based on arisings from the borehole during drilling. 4. Backfilled with arisings and sealed with bentonite upon completion.

GL (m AOD)
135.73

Eastings:
419266.10

Northings:
414594.00

Fig No.

BH119



BOREHOLE RECORD

BH No. **BH121**
Sheet 1 of 1

Site: Hermitage Park, Lepton

Contract No: C10281

Client: Miller Homes

Date(s):
23/10/2024

Method: Open rotary hole drilling

Scale: 1:150

SAMPLE DETAILS

STRATA RECORD

Logged By: Driller Checked By: GH

Driller: SDS

Depth From - To(m)	TCR	SCR	RQD	FI	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Well
						OVERBURDEN (DRILLER'S DESCRIPTION).				
1										
2										
3										
						Grey MUDSTONE with SANDSTONE bands (DRILLER'S DESCRIPTION).	3.30	137.39		
4						Dark MUDSTONE with COAL trace (DRILLER'S DESCRIPTION).	4.00	136.69		
						Grey MUDSTONE (DRILLER'S DESCRIPTION).	4.20	136.49		
5										
6										
7										
8						Grey MUDSTONE with SANDSTONE bands (DRILLER'S DESCRIPTION).	8.00	132.69		
9										
10										
11										
12						Grey MUDSTONE (DRILLER'S DESCRIPTION).	12.00	128.69		
13										
14										
15										
16										
17										
18										
19										
20										
21						SANDSTONE (DRILLER'S DESCRIPTION).	21.00	119.69		
22										
23						Grey MUDSTONE (DRILLER'S DESCRIPTION).	23.00	117.69		
24										
25						SANDSTONE (DRILLER'S DESCRIPTION).	24.50	116.19		
26										
27						Grey MUDSTONE with SANDSTONE bands (DRILLER'S DESCRIPTION).	27.00	113.69		
28										
29										
30						End of Borehole at 30.00m	30.00	110.69		

Remarks and Groundwater Observations:

1. Borehole complete at 30.00m bgl. 2. Drilled using air flush. 3. Logged based on arisings from the borehole during drilling. 4. Backfilled with arisings and sealed with bentonite upon completion.

GL (m AOD)
140.69
Eastings:
419360.70
Northings:
414610.60

Fig No.

BH121



BOREHOLE RECORD

BH No. **BH122**
Sheet 1 of 1

Site: Hermitage Park, Lepton

Contract No: C10281

Client: Miller Homes

Date(s):
22/10/2024

Method: Open rotary hole drilling

Scale: 1:150

SAMPLE DETAILS

STRATA RECORD

Logged By: Driller Checked By: GH

Driller: SDS

Depth From - To(m)	TCR	SCR	RQD	FI	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Well
						OVERBURDEN (DRILLER'S DESCRIPTION).				
1										
2						SANDSTONE (DRILLER'S DESCRIPTION).	2.00	129.72		
3										
4										
5										
6										
7						Grey MUDSTONE with SANDSTONE bands (DRILLER'S DESCRIPTION).	7.00	124.72		
8										
9										
10										
11										
12										
13						Grey MUDSTONE (DRILLER'S DESCRIPTION).	13.00	118.72		
14										
15										
16										
17						SOFT / NO RETURNS (DRILLER'S DESCRIPTION).	16.30	115.42		
18						HARD STRATA / NO RETURNS (DRILLER'S DESCRIPTION).	17.00	114.72		
19										
20						End of Borehole at 20.00m	20.00	111.72		
21										
22										
23										
24										
25										
26										
27										
28										
29										
30										

Remarks and Groundwater Observations:
1. Borehole complete at 20.00m bgl. 2. Drilled using air flush. 3. Logged based on arisings from the borehole during drilling. 4. Backfilled with arisings and sealed with bentonite upon completion.

GL (m AOD)
131.72
Eastings:
419204.30
Northings:
414558.30

Fig No.
BH122



BOREHOLE RECORD

BH No. **BH123**
Sheet 1 of 1

Site: Hermitage Park, Lepton

Contract No: C10281

Client: Miller Homes

Date(s):
21/10/2024

Method: Open rotary hole drilling

Scale: 1:150

SAMPLE DETAILS

STRATA RECORD

Logged By: Driller Checked By: GH

Driller: SDS

Depth From - To(m)	TCR	SCR	RQD	FI	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Well
						OVERBURDEN (DRILLER'S DESCRIPTION).				
1										
2						SANDSTONE (DRILLER'S DESCRIPTION).	1.50	133.52		
3										
4										
5										
6										
7										
8						Grey MUDSTONE (DRILLER'S DESCRIPTION).	8.00	127.02		
9										
10										
11										
12										
13						Grey MUDSTONE with SANDSTONE bands (DRILLER'S DESCRIPTION).	13.00	122.02		
14										
15										
16										
17										
18						SANDSTONE (DRILLER'S DESCRIPTION).	18.00	117.02		
19										
20						End of Borehole at 20.00m	20.00	115.02		
21										
22										
23										
24										
25										
26										
27										
28										
29										
30										

Remarks and Groundwater Observations:
1. Borehole complete at 20.00m bgl. 2. Drilled using air flush. 3. Logged based on arisings from the borehole during drilling. 4. Backfilled with arisings and sealed with bentonite upon completion.

GL (m AOD)
135.02
Eastings:
419246.70
Northings:
414566.30

Fig No.
BH123



BOREHOLE RECORD

BH No. **BH124**
Sheet 1 of 1

Site: Hermitage Park, Lepton

Contract No: C10281

Client: Miller Homes

Date(s):
22/10/2024

Method: Open rotary hole drilling

Scale: 1:150

SAMPLE DETAILS

STRATA RECORD

Logged By: Driller Checked By: GH

Driller: SDS

Depth From - To(m)	TCR	SCR	RQD	FI	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Well
						OVERBURDEN (DRILLER'S DESCRIPTION).				
1										
2						SANDSTONE (DRILLER'S DESCRIPTION).	2.00	134.15		
3										
4										
5										
6						Grey MUDSTONE (DRILLER'S DESCRIPTION).	6.00	130.15		
7										
8										
9										
10										
11										
12										
13										
14										
15						SANDSTONE (DRILLER'S DESCRIPTION).	15.00	121.15		
16										
17										
18						Grey MUDSTONE with SANDSTONE bands (DRILLER'S DESCRIPTION).	18.00	118.15		
19										
20										
21										
22										
23						Dark MUDSTONE with COAL trace (DRILLER'S DESCRIPTION).	23.20	112.95		
24						Grey MUDSTONE (DRILLER'S DESCRIPTION).	23.40	112.75		
25						End of Borehole at 25.00m	25.00	111.15		
26										
27										
28										
29										
30										

Remarks and Groundwater Observations:
1. Borehole complete at 25.00m bgl. 2. Drilled using air flush. 3. Logged based on arisings from the borehole during drilling. 4. Backfilled with gravel and sealed with bentonite upon completion.

GL (m AOD)
136.15
Eastings:
419293.90
Northings:
414574.60

Fig No.

BH124



BOREHOLE RECORD

BH No. **BH125**
Sheet 1 of 1

Site: Hermitage Park, Lepton

Contract No: C10281

Client: Miller Homes

Date(s):
23/10/2024

Method: Open rotary hole drilling

Scale: 1:150

SAMPLE DETAILS

STRATA RECORD

Logged By: Driller Checked By: GH

Driller: SDS

Depth From - To(m)	TCR	SCR	RQD	FI	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Well
						OVERBURDEN (DRILLER'S DESCRIPTION).				
1										
2						SANDSTONE (DRILLER'S DESCRIPTION).	1.60	136.59		
3										
4						COAL (DRILLER'S DESCRIPTION).	4.30	133.89		
5						Dark MUDSTONE (DRILLER'S DESCRIPTION).	4.50	133.69		
6						SANDSTONE (DRILLER'S DESCRIPTION).	4.70	133.49		
7										
8										
9										
10										
11										
12						Grey MUDSTONE (DRILLER'S DESCRIPTION).	12.00	126.19		
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23										
24						Grey MUDSTONE with SANDSTONE bands (DRILLER'S DESCRIPTION).	24.00	114.19		
25										
26										
27										
28										
29						Dark MUDSTONE with COAL trace (DRILLER'S DESCRIPTION).	28.50	109.69		
						Grey MUDSTONE (DRILLER'S DESCRIPTION).	28.70	109.49		
30						End of Borehole at 30.00m	30.00	108.19		

Remarks and Groundwater Observations:
 1. Borehole complete at 30.00m bgl. 2. Drilled using air flush. 3. Logged based on arisings from the borehole during drilling. 4. Installed with gas/groundwater monitoring well, as detailed above.

GL (m AOD)
138.19
Eastings:
419341.20
Northings:
414583.10

Fig No.

BH125



BOREHOLE RECORD

BH No. **BH126**
Sheet 1 of 1

Site: Hermitage Park, Lepton

Contract No: C10281

Client: Miller Homes

Date(s):
22/10/2024

Method: Open rotary hole drilling

Scale: 1:150

SAMPLE DETAILS

STRATA RECORD

Logged By: Driller Checked By: GH

Driller: SDS

Depth From - To(m)	TCR	SCR	RQD	FI	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Well
						OVERBURDEN (DRILLER'S DESCRIPTION).				
1										
2						SANDSTONE (DRILLER'S DESCRIPTION).	1.40	131.48		
3										
4										
5										
6										
7						Dark MUDSTONE with COAL trace (DRILLER'S DESCRIPTION).	6.50	126.38		
8						Grey MUDSTONE (DRILLER'S DESCRIPTION).	6.70	126.18		
9										
10										
11										
12										
13										
14										
15										
16										
17										
18						Dark MUDSTONE with COAL trace (DRILLER'S DESCRIPTION).	18.00	114.88		
19						Grey MUDSTONE with SANDSTONE bands (DRILLER'S DESCRIPTION).	18.30	114.58		
20										
21										
22										
23										
24										
25						Grey MUDSTONE (DRILLER'S DESCRIPTION).	25.00	107.88		
26										
27										
28										
29						SANDSTONE (DRILLER'S DESCRIPTION).	29.00	103.88		
30						End of Borehole at 30.00m	30.00	102.88		

Remarks and Groundwater Observations:
1. Borehole complete at 30.00m bgl. 2. Drilled using air flush. 3. Logged based on arisings from the borehole during drilling. 4. Backfilled with arisings and sealed with bentonite upon completion.

GL (m AOD)
132.88
Eastings:
419227.10
Northings:
414538.50

Fig No.

BH126



BOREHOLE RECORD

BH No. **BH127**
Sheet 1 of 1

Site: Hermitage Park, Lepton

Contract No: C10281

Client: Miller Homes

Date(s):
21/10/2024

Method: Open rotary hole drilling

Scale: 1:150

SAMPLE DETAILS

STRATA RECORD

Logged By: Driller Checked By: GH

Driller: SDS

Depth From - To(m)	TCR	SCR	RQD	FI	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Well
						OVERBURDEN (DRILLER'S DESCRIPTION).				
1							1.50	133.87		
2						SANDSTONE (DRILLER'S DESCRIPTION).				
3										
4										
5										
6										
7										
8						Grey MUDSTONE (DRILLER'S DESCRIPTION).	8.00	127.37		
9										
10										
11										
12										
13										
14						SANDSTONE (DRILLER'S DESCRIPTION).	14.00	121.37		
15										
16										
17										
18						Grey MUDSTONE with SANDSTONE bands (DRILLER'S DESCRIPTION).	18.00	117.37		
19										
20										
21										
22						Dark MUDSTONE with COAL trace (DRILLER'S DESCRIPTION).	21.50	113.87		
23						Grey MUDSTONE with SANDSTONE bands (DRILLER'S DESCRIPTION).	21.70	113.67		
24										
25						End of Borehole at 25.00m	25.00	110.37		
26										
27										
28										
29										
30										

Remarks and Groundwater Observations:
1. Borehole complete at 25.00m bgl. 2. Drilled using air flush. 3. Logged based on arisings from the borehole during drilling. 4. Backfilled with arisings and sealed with bentonite upon completion.

GL (m AOD)
135.37
Eastings:
419274.30
Northings:
414546.60

Fig No.

BH127



BOREHOLE RECORD

BH No. **BH128**
Sheet 1 of 1

Site: Hermitage Park, Lepton

Contract No: C10281

Client: Miller Homes

Date(s):
23/10/2024

Method: Open rotary hole drilling

Scale: 1:150

SAMPLE DETAILS

STRATA RECORD

Logged By: Driller Checked By: GH

Driller: SDS

Depth From - To(m)	TCR	SCR	RQD	FI	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Well
						OVERBURDEN (DRILLER'S DESCRIPTION).				
1										
2						SANDSTONE (DRILLER'S DESCRIPTION).	1.50	135.21		
						Dark MUDSTONE with COAL trace (DRILLER'S DESCRIPTION).	1.70	135.01		
						SANDSTONE (DRILLER'S DESCRIPTION).	1.90	134.81		
3										
4										
5										
6										
7										
8						Grey MUDSTONE (DRILLER'S DESCRIPTION).	8.00	128.71		
9										
10										
11										
12										
13										
14										
15										
16						Grey MUDSTONE with SANDSTONE bands (DRILLER'S DESCRIPTION).	16.00	120.71		
17										
18										
19										
20										
21										
22										
23										
24						COAL (DRILLER'S DESCRIPTION).	24.00	112.71		
						Dark MUDSTONE (DRILLER'S DESCRIPTION).	24.20	112.51		
						Grey MUDSTONE with SANDSTONE bands (DRILLER'S DESCRIPTION).	24.50	112.21		
25										
26										
27										
28										
29										
30						End of Borehole at 30.00m	30.00	106.71		

Remarks and Groundwater Observations:
1. Borehole complete at 30.00m bgl. 2. Drilled using air flush. 3. Logged based on arisings from the borehole during drilling. 4. Backfilled with arisings and sealed with bentonite upon completion.

GL (m AOD)
136.71
Eastings:
419321.90
Northings:
414555.00

Fig No.

BH128



BOREHOLE RECORD

BH No. **BH129**
Sheet 1 of 1

Site: Hermitage Park, Lepton

Contract No: C10281

Client: Miller Homes

Date(s):
23/10/2024

Method: Open rotary hole drilling

Scale: 1:150

SAMPLE DETAILS

STRATA RECORD

Logged By: Driller Checked By: GH

Driller: SDS

Depth From - To(m)	TCR	SCR	RQD	FI	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Well
						OVERBURDEN (DRILLER'S DESCRIPTION).				
1										
2						SANDSTONE (DRILLER'S DESCRIPTION).	1.50	137.59		
						COAL (DRILLER'S DESCRIPTION).	1.80	137.29		
						Grey MUDSTONE (DRILLER'S DESCRIPTION).	2.00	137.09		
3										
4										
5										
6										
7										
8										
9						SANDSTONE (DRILLER'S DESCRIPTION).	9.00	130.09		
10										
11										
12										
13										
14						Grey MUDSTONE with SANDSTONE bands (DRILLER'S DESCRIPTION).	13.60	125.49		
15										
16										
17										
18										
19										
20										
21										
22										
23										
24										
25						Grey MUDSTONE (DRILLER'S DESCRIPTION).	25.00	114.09		
26										
27										
28						Dark MUDSTONE with COAL trace (DRILLER'S DESCRIPTION).	28.30	110.79		
29						Grey MUDSTONE (DRILLER'S DESCRIPTION).	28.50	110.59		
30						End of Borehole at 30.00m	30.00	109.09		

Remarks and Groundwater Observations:

1. Borehole complete at 30.00m bgl. 2. Drilled using air flush. 3. Logged based on arisings from the borehole during drilling. 4. Backfilled with arisings and sealed with bentonite upon completion.

GL (m AOD)
139.09

Eastings:
419368.90

Northings:
414563.20

Fig No.

BH129



BOREHOLE RECORD

BH No. **BH130**
Sheet 1 of 1

Site: Hermitage Park, Lepton

Contract No: C10281

Client: Miller Homes

Date(s):
22/10/2024

Method: Open rotary hole drilling

Scale: 1:150

SAMPLE DETAILS

STRATA RECORD

Logged By: Driller Checked By: GH

Driller: SDS

Depth From - To(m)	TCR	SCR	RQD	FI	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Well
						OVERBURDEN (DRILLER'S DESCRIPTION).				
1						SANDSTONE (DRILLER'S DESCRIPTION).	1.00	127.00		
2										
3										
4										
5										
6										
7						Grey MUDSTONE (DRILLER'S DESCRIPTION).	7.00	121.00		
8										
9										
10										
11										
12										
13										
14						Dark MUDSTONE with COAL trace (DRILLER'S DESCRIPTION).	13.50	114.50		
						Grey MUDSTONE with SANDSTONE bands (DRILLER'S DESCRIPTION).	13.80	114.20		
15										
16										
17										
18										
19										
20										
21										
22										
23										
24						Grey MUDSTONE (DRILLER'S DESCRIPTION).	24.00	104.00		
25										
26										
27										
28										
29										
30						End of Borehole at 30.00m	30.00	98.00		

Remarks and Groundwater Observations:
1. Borehole complete at 30.00m bgl. 2. Drilled using air flush. 3. Logged based on arisings from the borehole during drilling. 4. Backfilled with arisings and sealed with bentonite upon completion.

GL (m AOD)
128.00
Eastings:
419207.70
Northings:
414510.90

Fig No.

BH130



BOREHOLE RECORD

BH No. **BH131**
Sheet 1 of 1

Site: Hermitage Park, Lepton

Contract No: C10281

Client: Miller Homes

Date(s):
22/10/2024

Method: Open rotary hole drilling

Scale: 1:150

SAMPLE DETAILS

STRATA RECORD

Logged By: Driller Checked By: GH

Driller: SDS

Depth From - To(m)	TCR	SCR	RQD	FI	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Well
						OVERBURDEN (DRILLER'S DESCRIPTION).				
1										
2						SANDSTONE (DRILLER'S DESCRIPTION).	1.50	131.74		
3										
4										
5						Dark MUDSTONE with COAL trace (DRILLER'S DESCRIPTION).	4.80	128.44		
6						Grey MUDSTONE (DRILLER'S DESCRIPTION).	5.00	128.24		
7										
8										
9										
10										
11										
12						Grey MUDSTONE with SANDSTONE bands (DRILLER'S DESCRIPTION).	12.00	121.24		
13										
14										
15										
16										
17										
18										
19						Dark MUDSTONE with COAL trace (DRILLER'S DESCRIPTION).	19.00	114.24		
20						Grey MUDSTONE (DRILLER'S DESCRIPTION).	19.50	113.74		
21						End of Borehole at 21.00m	21.00	112.24		
22										
23										
24										
25										
26										
27										
28										
29										
30										

Remarks and Groundwater Observations:
1. Borehole complete at 21.00m bgl. 2. Drilled using air flush. 3. Logged based on arisings from the borehole during drilling. 4. Backfilled with arisings and sealed with bentonite upon completion.

GL (m AOD)
133.24
Eastings:
419254.90
Northings:
414519.00

Fig No.

BH131



BOREHOLE RECORD

BH No. **BH132**
Sheet 1 of 1

Site: Hermitage Park, Lepton

Contract No: C10281

Client: Miller Homes

Date(s):
21/10/2024

Method: Open rotary hole drilling

Scale: 1:150

SAMPLE DETAILS

STRATA RECORD

Logged By: Driller Checked By: GH

Driller: SDS

Depth From - To(m)	TCR	SCR	RQD	FI	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Well
						OVERBURDEN (DRILLER'S DESCRIPTION).				
1										
2						SANDSTONE (DRILLER'S DESCRIPTION).	1.60	133.92		
3										
4										
5						Grey MUDSTONE (DRILLER'S DESCRIPTION).	5.00	130.52		
6										
7										
8						Dark MUDSTONE with COAL trace (DRILLER'S DESCRIPTION).	7.80	127.72		
9						Grey MUDSTONE with SANDSTONE bands (DRILLER'S DESCRIPTION).	8.00	127.52		
10										
11										
12						SANDSTONE (DRILLER'S DESCRIPTION).	12.00	123.52		
13										
14										
15										
16						Grey MUDSTONE with SANDSTONE bands (DRILLER'S DESCRIPTION).	16.00	119.52		
17										
18										
19										
20						End of Borehole at 20.00m	20.00	115.52		
21										
22										
23										
24										
25										
26										
27										
28										
29										
30										

Remarks and Groundwater Observations:
1. Borehole complete at 20.00m bgl. 2. Drilled using air flush. 3. Logged based on arisings from the borehole during drilling. 4. Backfilled with arisings and sealed with bentonite upon completion.

GL (m AOD)
135.52
Eastings:
419302.20
Northings:
414527.40

Fig No.

BH132



BOREHOLE RECORD

BH No. **BH133**
Sheet 1 of 1

Site: Hermitage Park, Lepton

Contract No: C10281

Client: Miller Homes

Date(s):
23/10/2024

Method: Open rotary hole drilling

Scale: 1:150

SAMPLE DETAILS

STRATA RECORD

Logged By: Driller Checked By: GH

Driller: SDS

Depth From - To(m)	TCR	SCR	RQD	FI	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Well
						OVERBURDEN (DRILLER'S DESCRIPTION).				
1										
2						SANDSTONE (DRILLER'S DESCRIPTION).	1.80	135.57		
3										
4										
5										
6						Dark MUDSTONE with COAL trace (DRILLER'S DESCRIPTION).	5.70	131.67		
						Grey MUDSTONE (DRILLER'S DESCRIPTION).	5.90	131.47		
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18						Grey MUDSTONE with SANDSTONE bands (DRILLER'S DESCRIPTION).	18.00	119.37		
19										
20										
21										
22										
23										
24						Dark MUDSTONE with COAL trace (DRILLER'S DESCRIPTION).	24.00	113.37		
						Grey MUDSTONE (DRILLER'S DESCRIPTION).	24.20	113.17		
25						End of Borehole at 25.00m	25.00	112.37		
26										
27										
28										
29										
30										

Remarks and Groundwater Observations:
1. Borehole complete at 25.00m bgl. 2. Drilled using air flush. 3. Logged based on arisings from the borehole during drilling. 4. Backfilled with gravel and sealed with bentonite upon completion.

GL (m AOD)
137.37
Eastings:
419349.40
Northings:
414535.40

Fig No.

BH133



BOREHOLE RECORD

BH No. **BH134**
Sheet 1 of 1

Site: Hermitage Park, Lepton

Contract No: C10281

Client: Miller Homes

Date(s):
21/10/2024

Method: Open rotary hole drilling

Scale: 1:150

SAMPLE DETAILS

STRATA RECORD

Logged By: Driller Checked By: GH

Driller: SDS

Depth From - To(m)	TCR	SCR	RQD	FI	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Well
						OVERBURDEN (DRILLER'S DESCRIPTION).	0.50	133.22		
1						SANDSTONE (DRILLER'S DESCRIPTION).				
2										
3										
4										
5										
6										
7										
8						Grey MUDSTONE (DRILLER'S DESCRIPTION).	8.00	125.72		
9										
10										
11										
12						SANDSTONE (DRILLER'S DESCRIPTION).	12.00	121.72		
13										
14										
15										
16						Grey MUDSTONE with SANDSTONE bands (DRILLER'S DESCRIPTION).	16.00	117.72		
17										
18										
19										
20						End of Borehole at 20.00m	20.00	113.72		
21										
22										
23										
24										
25										
26										
27										
28										
29										
30										

Remarks and Groundwater Observations:
1. Borehole complete at 20.00m bgl. 2. Drilled using air flush. 3. Logged based on arisings from the borehole during drilling. 4. Backfilled with arisings and sealed with bentonite upon completion.

GL (m AOD)
133.72
Eastings:
419282.60
Northings:
414499.50

Fig No.

BH134



BOREHOLE RECORD

BH No. **BH135**
Sheet 1 of 1

Site: Hermitage Park, Lepton

Contract No: C10281

Client: Miller Homes

Date(s):
22/10/2024

Method: Open rotary hole drilling

Scale: 1:150

SAMPLE DETAILS

STRATA RECORD

Logged By: Driller Checked By: GH

Driller: SDS

Depth From - To(m)	TCR	SCR	RQD	FI	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Well
						OVERBURDEN (DRILLER'S DESCRIPTION).				
					1	SANDSTONE (DRILLER'S DESCRIPTION).	1.00	127.23		
					2					
					3					
					4					
					5	End of Borehole at 5.00m	5.00	123.23		
					6					
					7					
					8					
					9					
					10					
					11					
					12					
					13					
					14					
					15					
					16					
					17					
					18					
					19					
					20					
					21					
					22					
					23					
					24					
					25					
					26					
					27					
					28					
					29					
					30					

Remarks and Groundwater Observations:
1. Borehole complete at 5.00m bgl. 2. Drilled using air flush. 3. Logged based on arisings from the borehole during drilling. 4. Installed with gas/groundwater monitoring well, as detailed above.

GL (m AOD)
128.23
Eastings:
419167.60
Northings:
414609.80

Fig No.

BH135



BOREHOLE RECORD

BH No. **BH136**
Sheet 1 of 1

Site: Hermitage Park, Lepton

Contract No: C10281

Client: Miller Homes

Date(s):
22/10/2024

Method: Open rotary hole drilling

Scale: 1:150

SAMPLE DETAILS

STRATA RECORD

Logged By: Driller Checked By: GH

Driller: SDS

Depth From - To(m)	TCR	SCR	RQD	FI	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Well
						OVERBURDEN (DRILLER'S DESCRIPTION).				
					1	SANDSTONE (DRILLER'S DESCRIPTION).	1.00	127.28		
					2					
					3					
					4					
					5	End of Borehole at 5.00m	5.00	123.28		
					6					
					7					
					8					
					9					
					10					
					11					
					12					
					13					
					14					
					15					
					16					
					17					
					18					
					19					
					20					
					21					
					22					
					23					
					24					
					25					
					26					
					27					
					28					
					29					
					30					

Remarks and Groundwater Observations:
 1. Borehole complete at 5.00m bgl. 2. Drilled using air flush. 3. Logged based on arisings from the borehole during drilling. 4. Installed with gas/groundwater monitoring well, as detailed above.

GL (m AOD)
128.28
Eastings:
419173.00
Northings:
414568.80

Fig No.
BH136



TRIAL PIT RECORD

TP No. **TP101**
Sheet 1 of 1

Site: Hermitage Park, Lepton

Contract No: C10281

Client: Miller Homes

Date: 22/10/2024

Method: 20 tonne excavator with 900mm toothed bucket

Scale: 1:25

SAMPLE DETAILS

STRATA RECORD

Logged By: J.C Checked By: GH

Type	Depth From - To(m)	Vane Results (kN/m ²) {ppm}	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Backfill
		76.0 80.0 86.0 78.0 82.0 90.0	1	Grass overlying dark brown slightly gravelly silty clayey TOPSOIL with frequent rootlets. Gravel is subangular to subrounded fine to medium of sandstone and rare coal.	0.30	143.50		
				Soft light brown slightly gravelly sandy friable CLAY. Low plasticity (field description). Gravel is angular to subrounded fine to coarse of sandstone and mudstone.	0.60	143.20		
				Firm to stiff high strength light grey mottled orangish brown slightly sandy gravelly CLAY. Medium plasticity (field description). Gravel is angular to subrounded fine to coarse of sandstone, mudstone and coal.				
				Moderately weathered greyish brown SANDSTONE. Recovered as sandy clayey angular to subangular fine to coarse gravel.	1.40	142.40		
				End of trial pit at 1.60m	1.60	142.20		
			2					
			3					
			4					
			5					

Remarks and Groundwater Observations
 1. Trial pit remained stable during excavation 2. Pit remained dry on completion. 3. Pit terminated at 1.6m bgl on bedrock. 4. Backfilled with arisings on completion. 5. Co-ordinates and elevations surveyed on site using survey-grade GPS. 6. No coal encountered.

GL (m AOD)
143.80
Easting:
419349.30
Northing:
414787.60

Fig No.

TP101



TRIAL PIT RECORD

TP No. **TP101A**
Sheet 1 of 1

Site: Hermitage Park, Lepton

Contract No: C10281

Client: Miller Homes

Date: 24/10/2024

Method: 20 tonne excavator with 900mm toothed bucket

Scale: 1:25

SAMPLE DETAILS

STRATA RECORD

Logged By: AEC Checked By: GH

Type	Depth From - To(m)	Vane Results (kN/m ²) (ppm)	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Backfill
				Grass overlying dark brown silty clayey TOPSOIL with frequent rootlets.	0.30	143.18		
				Highly to moderately weathered SANDSTONE bedrock recovered as light brown clayey sandy subangular fine to coarse gravel of sandstone with medium cobble content of subangular to angular fine to coarse sandstone. Sand is fine to coarse.				
			▼ 2	End of trial pit at 2.10m	2.10	141.38		
			3					
			4					
			5					

Remarks and Groundwater Observations
 1. Trial pit remained stable during excavation 2. Groundwater encountered from 2m bgl. 3. Pit terminated at 2.1m bgl on bedrock. 4. Backfilled with arisings on completion. 5. Co-ordinates and elevations surveyed on site using survey-grade GPS. 6. No coal encountered.

GL (m AOD)
143.48
 Easting:
419339.10
 Northing:
414779.40

Fig No.
TP101A



TRIAL PIT RECORD

TP No. **TP102**
Sheet 1 of 1

Site: Hermitage Park, Lepton

Contract No: C10281

Client: Miller Homes

Date:
22/10/2024

Method: 20 tonne excavator with 900mm toothed bucket

Scale: 1:25

SAMPLE DETAILS

STRATA RECORD

Logged By: J.C | Checked By: GH

Type	Depth From - To(m)	Vane Results (kN/m ²) (ppm)	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Backfill
		70.0 80.0 82.0		Grass overlying dark brown silty clayey TOPSOIL with frequent rootlets.	0.30	140.04		
				Firm to stiff medium to high strength light bluish grey mottled orange slightly sandy gravelly CLAY. Low plasticity (field description). Gravel is angular to subrounded fine to coarse of sandstone and mudstone.	0.90	139.44		
			1	Highly weathered light greyish brown locally bluish grey weathered SANDSTONE. Recovered as sandy clayey angular to subangular fine to coarse gravel.				
				<i>From 1.6m bgl: With frequent iron discolouring.</i>				
			2	End of trial pit at 2.10m	2.10	138.24		
			3					
			4					
			5					

Remarks and Groundwater Observations

1. Trial pit remained stable during excavation 2. Pit remained dry on completion. 3. Pit terminated at 2.1m bgl on bedrock. 4. Backfilled with arisings on completion. 5. Co-ordinates and elevations surveyed on site using survey-grade GPS. 6. No coal encountered.

GL (m AOD)
140.34
Easting:
419306.60
Northing:
414778.00

Fig No.

TP102



TRIAL PIT RECORD

TP No. **TP103**
Sheet 1 of 1

Site: Hermitage Park, Lepton

Contract No: C10281

Client: Miller Homes

Date:
22/10/2024

Method: 20 tonne excavator with 900mm toothed bucket

Scale: 1:25

SAMPLE DETAILS

STRATA RECORD

Logged By: J.C | Checked By: GH

Type	Depth From - To(m)	Vane Results (kN/m ²) (ppm)	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Backfill
D	1.30	88.0 96.0 96.0 100.0 102.0 98.0	1	Grass overlying dark brown silty clayey TOPSOIL with frequent rootlets.	0.30	138.26		
				Stiff high strength light grey mottled orange slightly sandy gravelly CLAY with low cobble content. Low plasticity (field description). Gravel is angular to subangular fine to coarse of sandstone and mudstone. Cobbles are subangular to subrounded of sandstone.				
				Black distinctly weathered COAL. Recovered as firm gravelly clay. Gravel is angular fine to coarse of coal.	1.20	137.36		
				Highly weathered light greyish brown weathered SANDSTONE. Recovered as sandy angular to subangular fine to coarse gravel.	1.40	137.16		
			2					
			3					
			4	End of trial pit at 3.80m	3.80	134.76		
			5					

Remarks and Groundwater Observations
 1. Trial pit remained stable during excavation 2. Pit remained dry on completion. 3. Pit terminated at 3.8m bgl on bedrock. 4. Backfilled with arisings on completion. 5. Co-ordinates and elevations surveyed on site using survey-grade GPS. 6. Trial pit extended westwards to delineate coal (See TP103A).

GL (m AOD)
138.56
Easting:
419277.40
Northing:
414773.10

Fig No.
TP103



TRIAL PIT RECORD

TP No. **TP103A**
Sheet 1 of 1

Site: Hermitage Park, Lepton

Contract No: C10281

Client: Miller Homes

Date: 22/10/2024

Method: 20 tonne excavator with 900mm toothed bucket

Scale: 1:25

SAMPLE DETAILS

STRATA RECORD

Logged By: J.C | Checked By: GH

Type	Depth From - To(m)	Vane Results (kN/m ²) (ppm)	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Backfill
		90.0 92.0 96.0	1	Grass overlying dark brown silty clayey TOPSOIL with frequent rootlets.	0.30	137.89		
				Stiff high strength light grey mottled orange slightly sandy gravelly CLAY with low cobble content. Low plasticity (field description). Gravel is angular to subangular fine to coarse of sandstone and mudstone. Cobbles are subangular to subrounded of sandstone.				
			2	Highly weathered light greyish brown weathered SANDSTONE. Recovered as sandy angular to subangular fine to coarse gravel.	1.30	136.89		
				End of trial pit at 2.40m	2.40	135.79		
			3					
			4					
			5					

Remarks and Groundwater Observations

1. Trial pit remained stable during excavation 2. Pit remained dry on completion. 3. Pit terminated at 2.4m bgl on bedrock. 4. Backfilled with arisings on completion. 5. Co-ordinates and elevations surveyed on site using survey-grade GPS. 6. No coal encountered.

GL (m AOD)
138.19
Easting:
419269.70
Northing:
414771.40

Fig No.

TP103A



TRIAL PIT RECORD

TP No. **TP104**
Sheet 1 of 1

Site: Hermitage Park, Lepton

Contract No: C10281

Client: Miller Homes

Date:
22/10/2024

Method: 20 tonne excavator with 900mm toothed bucket

Scale: 1:25

SAMPLE DETAILS

STRATA RECORD

Logged By: J.C | Checked By: GH

Type	Depth From - To(m)	Vane Results (kN/m ²) (ppm)	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Backfill
ES	0.40	48.0 52.0 56.0		Grass overlying dark brown silty clayey TOPSOIL with frequent rootlets.	0.30	136.35		
ES	0.90			MADE GROUND: Firm medium strength orange mottled bluish grey slightly sandy gravelly CLAY with low cobble content. Medium plasticity (field description). Gravel is angular to subrounded fine to coarse of sandstone, mudstone and rare coal. Cobbles are subangular of sandstone.	0.80	135.85		
			1	MADE GROUND: Greyish brown locally orangish brown slightly sandy very clayey GRAVEL with low cobble content and occasional pockets of firm gravelly CLAY. Gravel is angular to subrounded fine to coarse of sandstone, mudstone and occasional coal. Cobbles are subangular to subrounded of sandstone. <i>At 1m bgl: 1 No. rectangular sandstone boulder - 0.8 x 0.4 x 0.2m.</i>				
			2	Highly weathered light greyish brown locally light bluish grey weathered SANDSTONE. Recovered as slightly clayey sandy angular to subangular fine to coarse gravel.	1.70	134.95		
			3					
				End of trial pit at 3.30m	3.30	133.35		
			4					
			5					

Remarks and Groundwater Observations

1. Trial pit remained stable during excavation 2. Pit remained dry on completion. 3. Pit terminated at 3.3m bgl on bedrock. 4. Backfilled with arisings on completion. 5. Co-ordinates and elevations surveyed on site using survey-grade GPS. 6. No coal encountered.

GL (m AOD)
136.65
Easting:
419240.90
Northing:
414753.00

Fig No.

TP104



TRIAL PIT RECORD

TP No. **TP104A**
Sheet 1 of 1

Site: Hermitage Park, Lepton

Contract No: C10281

Client: Miller Homes

Date: 22/10/2024

Method: 20 tonne excavator with 900mm toothed bucket

Scale: 1:25

SAMPLE DETAILS

STRATA RECORD

Logged By: J.C | Checked By: GH

Type	Depth From - To(m)	Vane Results (kN/m ²) (ppm)	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Backfill
D	1.25	66.0	1	Grass overlying dark brown silty clayey TOPSOIL with frequent rootlets.	0.30	137.03		
		74.0		Firm to stiff medium to high strength light orangish brown light grey slightly sandy gravelly CLAY. Low plasticity (field description). Gravel is angular to subrounded fine to coarse of sandstone and mudstone.				
		88.0						
		76.0	2	Pocket of black distinctly weathered COAL. Recovered as firm gravelly clay. Gravel is angular fine to coarse of coal - Coal only located in northern wall of trial pit, 0.7m in length from east to west. Highly weathered greyish brown weathered SANDSTONE. Recovered as sandy angular to subangular fine to coarse gravel.	1.20	136.13		
		88.0			1.30	136.03		
		92.0						
			3	End of trial pit at 2.90m	2.90	134.43		
			4					
			5					

Remarks and Groundwater Observations

1. Trial pit remained stable during excavation 2. Pit remained dry on completion. 3. Pit terminated at 2.9m bgl on bedrock. 4. Backfilled with arisings on completion. 5. Co-ordinates and elevations surveyed on site using survey-grade GPS. 6. Trial pit extended, no coal encountered east or west of original pit location.

GL (m AOD)
137.33
Easting:
419260.00
Northing:
414735.80

Fig No.

TP104A



TRIAL PIT RECORD

TP No. **TP105**
Sheet 1 of 1

Site: Hermitage Park, Lepton

Contract No: C10281

Client: Miller Homes

Date:
24/10/2024

Method: 20 tonne excavator with 900mm toothed bucket

Scale: 1:25

SAMPLE DETAILS

STRATA RECORD

Logged By: AEC Checked By: GH

Type	Depth From - To(m)	Vane Results (kN/m ²) (ppm)	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Backfill
ES	2.00			Grass overlying dark brown silty clayey TOPSOIL with frequent rootlets.	0.30	135.45		
				Firm light orangish brown silty CLAY.				
				Stiff light grey mottled orangish brown slightly gravelly CLAY. Gravel is subangular fine to medium of sandstone.	1.20	134.55		
				Distinctly weathered COAL recovered as black slightly gravelly clay. Gravel is angular fine to medium coal. Stiff light grey mottled orangish brown slightly gravelly CLAY. Gravel is subangular fine to medium of sandstone. End of trial pit at 2.20m	2.00 2.10 2.20	133.75 133.65 133.55		

Remarks and Groundwater Observations

1. Trial pit remained stable during excavation 2. Pit remained dry on completion. 3. Pit terminated at 2.2m bgl on bedrock. 4. Backfilled with arisings on completion. 5. Co-ordinates and elevations surveyed on site using survey-grade GPS.

GL (m AOD)
135.75
Easting:
419242.90
Northing:
414694.40

Fig No.

TP105



TRIAL PIT RECORD

TP No. **TP105A**
Sheet 1 of 1

Site: Hermitage Park, Lepton

Contract No: C10281

Client: Miller Homes

Date:
24/10/2024

Method: 20 tonne excavator with 900mm toothed bucket

Scale: 1:25

SAMPLE DETAILS

STRATA RECORD

Logged By: AEC Checked By: GH

Type	Depth From - To(m)	Vane Results (kN/m ²) (ppm)	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Backfill
				Grass overlying dark brown silty clayey TOPSOIL with frequent rootlets.	0.30	134.76		
				Firm light orangish brown silty CLAY.				
			1					
				Stiff light grey mottled orangish brown slightly gravelly CLAY. Gravel is subangular fine to medium of sandstone.	1.20	133.86		
				Distinctly weathered COAL recovered as black slightly gravelly clay. Gravel is angular fine to medium of coal.	1.70	133.36		
				Stiff light grey mottled orangish brown slightly gravelly CLAY. Gravel is subangular fine to medium of sandstone.	1.80	133.26		
			2					
				End of trial pit at 2.10m	2.10	132.96		
			3					
			4					
			5					

Remarks and Groundwater Observations

1. Trial pit remained stable during excavation 2. Pit remained dry on completion. 3. Pit terminated at 2.1m bgl on bedrock. 4. Backfilled with arisings on completion. 5. Co-ordinates and elevations surveyed on site using survey-grade GPS.

GL (m AOD)
135.06
Easting:
419233.40
Northing:
414682.90

Fig No.

TP105A



TRIAL PIT RECORD

TP No. **TP106**
Sheet 1 of 1

Site: Hermitage Park, Lepton

Contract No: C10281

Client: Miller Homes

Date:
24/10/2024

Method: 20 tonne excavator with 900mm toothed bucket

Scale: 1:25

SAMPLE DETAILS

STRATA RECORD

Logged By: AEC | Checked By: GH

Type	Depth From - To(m)	Vane Results (kN/m ²) (ppm)	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Backfill
ES	2.10			Grass overlying dark brown silty clayey TOPSOIL with frequent rootlets.	0.30	138.44		
				Firm light orangish brown silty CLAY.				
				Stiff light grey mottled orangish brown slightly gravelly CLAY. Gravel is subangular fine to medium of sandstone.	0.80	137.94		
				<p><i>From 1.4m-1.5m bgl; highly weathered coal in western extent of trial trench.</i></p> <p><i>From 1.5m-1.6m bgl; highly weathered coal in centre of trial trench.</i></p>				
				Highly weathered COAL recovered as clayey angular fine to medium gravel of coal.	2.10	136.64		
Stiff light grey slightly gravelly CLAY. Gravel is subangular fine to medium of sandstone.	2.20	136.54						
	2.30	136.44						
				End of trial pit at 2.30m				

Remarks and Groundwater Observations

1. Trial pit remained stable during excavation 2. Pit remained dry on completion. 3. Pit terminated at 2.3m bgl on residual soil. 4. Backfilled with arisings on completion. 5. Co-ordinates and elevations surveyed on site using survey-grade GPS. 6. Trench extended westwards, coal encountered from 1.4-1.5m in west of trial pit.

GL (m AOD)
138.74
Easting:
419342.60
Northing:
414613.50

Fig No.

TP106



TRIAL PIT RECORD

TP No. **TP106A**
Sheet 1 of 1

Site: Hermitage Park, Lepton

Contract No: C10281

Client: Miller Homes

Date:
24/10/2024

Method: 20 tonne excavator with 900mm toothed bucket

Scale: 1:25

SAMPLE DETAILS

STRATA RECORD

Logged By: AEC Checked By: GH

Type	Depth From - To(m)	Vane Results (kN/m ²) (ppm)	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Backfill
				Grass overlying dark brown silty clayey TOPSOIL with frequent rootlets.				
				Firm light orangish brown silty CLAY.	0.30	137.38		
				Stiff light grey mottled orangish brown slightly gravelly CLAY. Gravel is subangular fine to medium of sandstone.	0.50	137.18		
				Residual COAL recovered as black slightly gravelly clay. Gravel is angular fine to medium of coal.	1.20	136.48		
				<i>No coal encountered in western extent of trial trench.</i>	1.30	136.38		
				Stiff light grey slightly gravelly CLAY. Gravel is subangular fine to medium of sandstone.	1.50	136.18		
				End of trial pit at 1.50m				

Remarks and Groundwater Observations

1. Trial pit remained stable during excavation 2. Pit remained dry on completion. 3. Pit terminated at 1.5m bgl on residual soil. 4. Backfilled with arisings on completion. 5. Co-ordinates and elevations surveyed on site using survey-grade GPS. 6. Trench extended westwards, no coal encountered in western extent of trial pit.

GL (m AOD)
137.68
Easting:
419325.30
Northing:
414607.30

Fig No.

TP106A



TRIAL PIT RECORD

TP No. **TP107**
Sheet 1 of 1

Site: Hermitage Park, Lepton

Contract No: C10281

Client: Miller Homes

Date:
22/10/2024

Method: 20 tonne excavator with 900mm toothed bucket

Scale: 1:25

SAMPLE DETAILS

STRATA RECORD

Logged By: J.C | Checked By: GH

Type	Depth From - To(m)	Vane Results (kN/m ²) (ppm)	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Backfill
		86.0 90.0 92.0		Grass overlying dark brown silty clayey TOPSOIL with frequent rootlets.	0.30	138.77		
				Stiff high strength light bluish grey mottled orange slightly sandy gravelly CLAY. Low plasticity (field description). Gravel is angular to subangular fine to coarse of sandstone and mudstone.				
			1	Moderately weathered greyish brown SANDSTONE. Recovered as sandy angular to subangular fine to coarse gravel.	1.00	138.07		
				End of trial pit at 1.30m	1.30	137.77		
			2					
			3					
			4					
			5					

Remarks and Groundwater Observations
 1. Trial pit remained stable during excavation 2. Pit remained dry on completion. 3. Pit terminated at 1.3m bgl on bedrock. 4. Backfilled with arisings on completion. 5. Co-ordinates and elevations surveyed on site using survey-grade GPS. 6. No coal encountered.

GL (m AOD)
139.07
Easting:
419357.50
Northing:
414588.60

Fig No.

TP107



TRIAL PIT RECORD

TP No. **TP108**
Sheet 1 of 1

Site: Hermitage Park, Lepton

Contract No: C10281

Client: Miller Homes

Date: 22/10/2024

Method: 20 tonne excavator with 900mm toothed bucket

Scale: 1:25

SAMPLE DETAILS

STRATA RECORD

Logged By: J.C | Checked By: GH

Type	Depth From - To(m)	Vane Results (kN/m ²) (ppm)	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Backfill
D	1.75	64.0 72.0 80.0	1	Grass overlying dark brown silty clayey TOPSOIL with frequent rootlets.	0.20	137.39		
				Firm to stiff medium to high strength orangish brown mottled bluish grey slightly sandy gravelly CLAY. Medium plasticity (field description). Gravel is angular to subrounded fine to coarse of sandstone and mudstone.	0.80	136.79		
				Stiff light grey with occasional orangish brown mottling slightly sandy gravelly friable CLAY. Low plasticity (field description). Gravel is angular to subrounded fine to coarse of sandstone.	1.70	135.89		
				From 1.3m to 1.4m bgl: highly weathered coal in western extent of trial trench.	1.80	135.79		
			2	Black distinctly weathered COAL. Recovered as clayey angular to subangular fine to coarse gravel. Highly weathered greyish brown weathered SANDSTONE. Recovered as sandy clayey angular to subangular fine to coarse gravel.	2.60	134.99		
			3	End of trial pit at 2.60m				
			4					
			5					

Remarks and Groundwater Observations

1. Trial pit remained stable during excavation 2. Pit remained dry on completion. 3. Pit terminated at 2.6m bgl on bedrock. 4. Backfilled with arisings on completion. 5. Co-ordinates and elevations surveyed on site using survey-grade GPS. 6. Trench extended 14m westwards, coal encountered at 1.8m in furthest eastern extent and 1.3m bgl in western extent.

GL (m AOD)
137.59
Easting:
419354.90
Northing:
414551.80

Fig No.

TP108



TRIAL PIT RECORD

TP No. **TP108A**
Sheet 1 of 1

Site: Hermitage Park, Lepton

Contract No: C10281

Client: Miller Homes

Date:
24/10/2024

Method: 20 tonne excavator with 900mm toothed bucket

Scale: 1:25

SAMPLE DETAILS

STRATA RECORD

Logged By: AEC Checked By: GH

Type	Depth From - To(m)	Vane Results (kN/m ²) (ppm)	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Backfill
ES	0.90		1	Grass overlying dark brown silty clayey TOPSOIL with frequent rootlets.	0.25	136.65		
				Firm light orangish brown silty CLAY.				
				Stiff light grey mottled orangish brown slighty gravelly CLAY. Gravel is subangular fine to medium of sandstone.	0.70	136.20		
				Distinctly weathered COAL recovered as black slightly gravelly clay. Gravel is angular fine to medium of coal.	0.90	136.00		
				Coal thins from 13cm becoming <1cm thick 1.8m from eastern extent of trial pit. Stiff light grey mottled orangish brown slighty gravelly CLAY. Gravel is subangular fine to medium of sandstone.	1.03	135.87		
							2	End of trial pit at 1.80m
			3					
			4					
			5					

Remarks and Groundwater Observations

1. Trial pit remained stable during excavation 2. Pit remained dry on completion. 3. Pit terminated at 1.8m bgl on residual soil. 4. Backfilled with arisings on completion. 5. Co-ordinates and elevations surveyed on site using survey-grade GPS. 6. Coal tapers out 1.8m from eastern extent of trial pit.

GL (m AOD)
136.90
Easting:
419338.10
Northing:
414540.80

Fig No.

TP108A



TRIAL PIT RECORD

TP No. **TP109**
Sheet 1 of 1

Site: Hermitage Park, Lepton

Contract No: C10281

Client: Miller Homes

Date:
24/10/2024

Method: 20 tonne excavator with 900mm toothed bucket

Scale: 1:25

SAMPLE DETAILS

STRATA RECORD

Logged By: AEC Checked By: GH

Type	Depth From - To(m)	Vane Results (kN/m ²) (ppm)	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Backfill
				Grass overlying dark brown silty clayey TOPSOIL with frequent rootlets.				
				Firm light orangish brown silty CLAY.	0.40	134.97		
			1	Stiff light grey mottled orangish brown slightly gravelly CLAY. Gravel is subangular fine to medium of sandstone.	0.90	134.47		
			2	Highly weathered SANDSTONE bedrock recovered as very weak light greyish brown angular fine to coarse gravel of sandstone with ironstone discolouration with low cobble content of angular sandstone.	1.90	133.47		
				End of trial pit at 2.20m	2.20	133.17		
			3					
			4					
			5					

Remarks and Groundwater Observations

1. Trial pit remained stable during excavation 2. Pit remained dry on completion. 3. Pit terminated at 2.2m bgl on highly weathered sandstone. 4. Backfilled with arisings on completion. 5. Co-ordinates and elevations surveyed on site using survey-grade GPS. 6. No coal encountered.

GL (m AOD)
135.37
Easting:
419291.70
Northing:
414532.10

Fig No.

TP109



TRIAL PIT RECORD

TP No. **TP110**
Sheet 1 of 1

Site: Hermitage Park, Lepton

Contract No: C10281

Client: Miller Homes

Date:
24/10/2024

Method: 20 tonne excavator with 900mm toothed bucket

Scale: 1:25

SAMPLE DETAILS

STRATA RECORD

Logged By: AEC Checked By: GH

Type	Depth From - To(m)	Vane Results (kN/m ²) (ppm)	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Backfill
ES	1.50			Grass overlying dark brown silty clayey TOPSOIL with frequent rootlets.	0.30	135.48		
				Firm light orangish brown silty CLAY with rare rootlets.				
				Stiff light grey mottled orangish brown CLAY.	0.60	135.18		
				Pocket of distinctly weathered COAL recovered as slightly gravelly clay. Gravel is angular fine to medium of coal.	2.00	133.78		
				Stiff light grey mottled orangish brown slightly gravelly CLAY. Gravel is subangular fine to medium of sandstone.	2.10	133.68		
				Highly weathered SANDSTONE bedrock recovered as very weak light greyish brown subangular to angular fine to coarse gravel of sandstone with ironstone discolouration.	2.50	133.28		
				End of trial pit at 2.60m	2.60	133.18		

Remarks and Groundwater Observations
 1. Trial pit remained stable during excavation 2. Pit remained dry on completion. 3. Pit terminated at 2.6m bgl on highly weathered sandstone. 4. Backfilled with arisings on completion. 5. Co-ordinates and elevations surveyed on site using survey-grade GPS. 6. Trench extended westwards, coal encountered 2m west of eastern extent of trial pit.

GL (m AOD)
135.78
Easting:
419279.80
Northing:
414580.10

Fig No.
TP110



TRIAL PIT RECORD

TP No. **TP110A**
Sheet 1 of 1

Site: Hermitage Park, Lepton

Contract No: C10281

Client: Miller Homes

Date:
24/10/2024

Method: 20 tonne excavator with 900mm toothed bucket

Scale: 1:25

SAMPLE DETAILS

STRATA RECORD

Logged By: AEC Checked By: GH

Type	Depth From - To(m)	Vane Results (kN/m ²) {ppm}	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Backfill
				Grass overlying dark brown silty clayey TOPSOIL with frequent rootlets.	0.30	135.27	[Cross-hatch pattern]	[Cross-hatch pattern]
				Firm light orangish brown mottled grey silty CLAY.				
			1	Stiff light grey mottled orangish brown CLAY.	0.90	134.67	[Horizontal line pattern]	[Cross-hatch pattern]
			2	Highly weathered SANDSTONE bedrock recovered as very weak light greyish brown subangular to angular fine to coarse gravel of sandstone with ironstone discolouration.	1.80	133.77	[Dotted pattern]	[Cross-hatch pattern]
				End of trial pit at 2.20m	2.20	133.37		
			3					
			4					
			5					

Remarks and Groundwater Observations
 1. Trial pit remained stable during excavation 2. Pit remained dry on completion. 3. Pit terminated at 2.2m bgl on highly weathered sandstone. 4. Backfilled with arisings on completion. 5. Co-ordinates and elevations surveyed on site using survey-grade GPS. 6. No coal encountered.

GL (m AOD)
135.57
Easting:
419263.10
Northing:
414574.20

Fig No.

TP110A



TRIAL PIT RECORD

TP No. **TP111**
Sheet 1 of 1

Site: Hermitage Park, Lepton

Contract No: C10281

Client: Miller Homes

Date:
24/10/2024

Method: 20 tonne excavator with 900mm toothed bucket

Scale: 1:25

SAMPLE DETAILS

STRATA RECORD

Logged By: AEC Checked By: GH

Type	Depth From - To(m)	Vane Results (kN/m ²) {ppm}	Ground -water	Description	Depth (m)	Level (m AOD)	Legend	Backfill
				Grass overlying dark brown silty clayey TOPSOIL with frequent rootlets.	0.30	131.47		
				Highly weathered SANDSTONE bedrock recovered as light brown clayey sandy subangular fine to coarse gravel of sandstone with medium cobble content of subangular to angular sandstone. Sand is fine to coarse.				
			1					
			2	End of trial pit at 2.10m	2.10	129.67		
			3					
			4					
			5					

Remarks and Groundwater Observations
 1. Trial pit remained stable during excavation 2. Pit remained dry on completion. 3. Pit terminated at 2.1m bgl on bedrock. 4. Backfilled with arisings on completion. 5. Co-ordinates and elevations surveyed on site using survey-grade GPS. 6. No coal encountered.

GL (m AOD)
131.77
Easting:
419200.90
Northing:
414605.50

Fig No.

TP111

APPENDIX E

Laboratory Test Results



Final Report

Report No.: 24-35291-1

Initial Date of Issue: 05-Nov-2024

Re-Issue Details:

Client Sirius Geotechnical Ltd

Client Address: 4250 (Downstairs) Thorpe Park
Park Approach
Leeds
West Yorkshire
LS15 8GB

Contact(s): Gemma Halliday
Jack Clarke

Project C10281 Hermitage Park

Quotation No.: **Date Received:** 30-Oct-2024

Order No.: 24946/C10281/GH **Date Instructed:** 30-Oct-2024

No. of Samples: 5

Turnaround (Wkdays): 5 **Results Due:** 05-Nov-2024

Date Approved: 05-Nov-2024

Approved By:

Details: David Smith, Technical Director

For details about application of accreditation to specific matrix types, please refer to the Table at the back of this report

Results - Soil

Project: C10281 Hermitage Park

Client: Sirius Geotechnical Ltd		Chemtest Job No.: 24-35291								
Quotation No.:		Chemtest Sample ID.:								
		Client Sample ID.:			24-35291		24-35291		24-35291	
		Sample Type:			1887922		1887923		1887924	
		Top Depth (m):			TP103		TP104		TP104	
		Date Sampled:			SOIL		SOIL		SOIL	
		Asbestos Lab:			1.30		0.40		0.90	
					22-Oct-2024		22-Oct-2024		22-Oct-2024	
					22-Oct-2024		24-Oct-2024		24-Oct-2024	
					NEW-ASB		NEW-ASB			
Determinand	HWOL Code	Accred.	SOP	Units	LOD					
ACM Type		U	2192		N/A		-	-		
Asbestos Identification		U	2192		N/A		No Asbestos Detected	No Asbestos Detected		
Moisture		N	2030	%	0.020	16	20	11	16	21
Soil Colour		N	2040		N/A	Brown	Brown	Brown	Black	Black/brown
Other Material		N	2040		N/A	None	Stones and Roots	Stones	None	None
Soil Texture		N	2040		N/A	Clay	Clay	Loam	Other	Clay/loam
pH at 20C		M	2010		4.0		6.6	6.3		
Sulphate (2:1 Water Soluble) as SO4		M	2120	g/l	0.010		< 0.010	< 0.010		
Sulphate (Total)		U	2430	%	0.010		0.055	0.022		
Arsenic		M	2455	mg/kg	0.5		8.4	11		
Cadmium		M	2455	mg/kg	0.10		0.10	0.18		
Chromium		M	2455	mg/kg	0.5		25	28		
Copper		M	2455	mg/kg	0.50		29	35		
Mercury		M	2455	mg/kg	0.05		< 0.05	< 0.05		
Nickel		M	2455	mg/kg	0.50		21	54		
Lead		M	2455	mg/kg	0.50		19	29		
Selenium		M	2455	mg/kg	0.25		0.83	1.2		
Zinc		M	2455	mg/kg	0.50		61	100		
Chromium (Hexavalent)		N	2490	mg/kg	0.50		< 0.50	< 0.50		
Total Organic Carbon		M	2625	%	0.20		0.64	1.5		
Naphthalene		M	2700	mg/kg	0.10		< 0.10	< 0.10		
Acenaphthylene		M	2700	mg/kg	0.10		< 0.10	< 0.10		
Acenaphthene		M	2700	mg/kg	0.10		< 0.10	< 0.10		
Fluorene		M	2700	mg/kg	0.10		< 0.10	< 0.10		
Phenanthrene		M	2700	mg/kg	0.10		< 0.10	< 0.10		
Anthracene		M	2700	mg/kg	0.10		< 0.10	< 0.10		
Fluoranthene		M	2700	mg/kg	0.10		< 0.10	< 0.10		
Pyrene		M	2700	mg/kg	0.10		< 0.10	< 0.10		
Benzo[a]anthracene		M	2700	mg/kg	0.10		< 0.10	< 0.10		
Chrysene		M	2700	mg/kg	0.10		< 0.10	< 0.10		
Benzo[b]fluoranthene		M	2700	mg/kg	0.10		< 0.10	< 0.10		
Benzo[k]fluoranthene		M	2700	mg/kg	0.10		< 0.10	< 0.10		
Benzo[a]pyrene		M	2700	mg/kg	0.10		< 0.10	< 0.10		
Indeno(1,2,3-c,d)Pyrene		M	2700	mg/kg	0.10		< 0.10	< 0.10		
Dibenz(a,h)Anthracene		M	2700	mg/kg	0.10		< 0.10	< 0.10		
Benzo[g,h,i]perylene		M	2700	mg/kg	0.10		< 0.10	< 0.10		
Total Of 16 PAH's		M	2700	mg/kg	2.0		< 2.0	< 2.0		

Results - Soil

Project: C10281 Hermitage Park

Client: Sirius Geotechnical Ltd		Chemtest Job No.:					24-35291	24-35291	24-35291	24-35291	24-35291
Quotation No.:		Chemtest Sample ID.:					1887922	1887923	1887924	1887925	1887926
		Client Sample ID.:					TP103	TP104	TP104	TP106	TP108A
		Sample Type:					SOIL	SOIL	SOIL	SOIL	SOIL
		Top Depth (m):					1.30	0.40	0.90	2.10	0.90
		Date Sampled:					22-Oct-2024	22-Oct-2024	22-Oct-2024	24-Oct-2024	24-Oct-2024
		Asbestos Lab:						NEW-ASB	NEW-ASB		
Determinand	HWOL Code	Accred.	SOP	Units	LOD						
Total Phenols		M	2920	mg/kg	0.10		< 0.10	< 0.10			
Cairney Screen		N			N/A	F			F	F	

Test Methods

SOP	Title	Parameters included	Method summary	Water Accred.
2010	pH Value of Soils	pH at 20°C	pH Meter	
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <30°C.	
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930	
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES	
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry	
2430	Total Sulphate in soils	Total Sulphate	Acid digestion followed by determination of sulphate in extract by ICP-OES.	
2455	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.	
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazine.	
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.	
2700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds)	
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.	

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

This report shall not be reproduced except in full, and only with the prior approval of the laboratory.

Any comments or interpretations are outside the scope of UKAS accreditation.

The Laboratory is not accredited for any sampling activities and reported results relate to the samples 'as received' at the laboratory.

Uncertainty of measurement for the determinands tested are available upon request .

None of the results in this report have been recovery corrected.

All results are expressed on a dry weight basis.

The following tests were analysed on samples 'as received' and the results subsequently corrected to a dry weight basis EPH, VPH, TPH, BTEX, VOCs, SVOCs, PCBs, Phenols.

For all other tests the samples were dried at $\leq 30^{\circ}\text{C}$ prior to analysis.

All Asbestos testing is performed at the indicated laboratory .

Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1.

Sample Deviation Codes

- A - Date of sampling not supplied
- B - Sample age exceeds stability time (sampling to extraction)
- C - Sample not received in appropriate containers
- D - Broken Container
- E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt.

All water samples will be retained for 14 days from the date of receipt.

Charges may apply to extended sample storage.

Water Sample Category Key for Accreditation

- DW - Drinking Water
- GW - Ground Water
- LE - Land Leachate
- NA - Not Applicable

Report Information

PL - Prepared Leachate
PW - Processed Water
RE - Recreational Water
SA - Saline Water
SW - Surface Water
TE - Treated Effluent
TS - Treated Sewage
UL - Unspecified Liquid

Clean Up Codes

NC - No Clean Up
MC - Mathematical Clean Up
FC - Florisil Clean Up

HWOL Acronym System

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
Total - Aliphatics & Aromatics
AL - Aliphatics only
AR - Aromatic only
2D - GC-GC – Double coil gas chromatography
#1 - EH_2D_Total but with humics mathematically subtracted
#2 - EH_2D_Total but with fatty acids mathematically subtracted
+ - Operator to indicate cumulative e.g. EH+EH_Total or EH_CU+HS_Total

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

APPENDIX F

Monitoring Results

Ground Gas and Groundwater Monitoring Record Sheet



JOB DETAILS:

Client: Miller Homes
Site: Hermitage Park, Lepton
Date: 04/11/2024

Job No: C10281
Visit No: 1 of 9
Operator: JC/RT

Project Manager: GH

Monitoring Point	GAS CONCENTRATIONS												VOLATILES		FLOW DATA				Qhg per borehole		WELL AND WATER DATA					Comments
	Methane (%v/v)		%LEL		Carbon dioxide (%v/v)		Carbon monoxide (ppmv)		Hydrogen sulphide (ppmv)		Oxygen (%v/v)		PID Peak (ppm)	Product thickness (mm)	Flow rate (l/hr)		Differential borehole Pressure (Pa)	Time for flow to equalise (secs)	Methane (l/hr)	CO2 (l/hr)	Water level (mbgl)	Depth of well (m)	Top of BH (mAOD)	Water level (mAOD)	Response Zone	
	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Min.	Steady			Peak	Steady										
BH104	ND	ND	ND	ND	0.4	0.4	ND	ND	ND	ND	17.7	17.7	NR	NR	ND	ND	ND	NR	0.0001	0.0004	4.32	9.00	137.10	132.78		
BH105	ND	ND	ND	ND	0.4	0.4	5	5	ND	ND	17.8	17.8	NR	NR	ND	ND	ND	NR	0.0001	0.0004	5.44	8.96	139.60	134.16		
BH109	ND	ND	ND	ND	0.2	0.2	ND	ND	ND	ND	18.6	18.6	NR	NR	ND	ND	ND	NR	0.0001	0.0002	9.34	17.96	131.70	122.36		
BH111	ND	ND	ND	ND	0.9	0.9	ND	ND	2	2	15.2	15.2	NR	NR	ND	ND	ND	NR	0.0001	0.0009	7.83	25.02	136.70	128.87		
BH114	ND	ND	ND	ND	0.4	0.4	ND	ND	ND	ND	17.9	17.9	NR	NR	ND	ND	ND	NR	0.0001	0.0004	DRY	5.23	135.80	DRY		
BH116	ND	ND	ND	ND	0.3	0.3	1	1	2	2	18.5	18.5	NR	NR	ND	ND	ND	NR	0.0001	0.0003	4.87	5.82	135.00	130.13		
BH118	ND	ND	ND	ND	0.5	0.5	13	13	2	2	14.4	14.4	NR	NR	ND	ND	ND	NR	0.0001	0.0005	3.82	20.00	133.20	129.38		
BH125	ND	ND	ND	ND	0.8	0.8	ND	ND	ND	ND	17.1	17.1	NR	NR	ND	ND	ND	NR	0.0001	0.0008	3.06	9.43	138.10	135.04		
BH135	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	19.9	19.9	NR	NR	ND	ND	ND	NR	0.0001	0.0001	DRY	4.79	128.20	DRY		
BH136	ND	ND	ND	ND	0.9	0.9	1	1	ND	ND	18.2	18.2	NR	NR	ND	ND	ND	NR	0.0001	0.0009	4.60	4.88	128.20	123.60		
Max	ND	ND	ND	ND	0.9	0.9	13	13	2	2	19.9	19.9	NR	NR	ND	ND	ND	NR	0.0001	0.0009	9.34			135.04		
Min	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	14.4	14.4	NR	NR	ND	ND	ND	NR	0.0001	0.0001	DRY				DRY	

ND - Not detected

NR - Not recorded

NB: Where no flow (ND) recorded, Qhg values are calculated using equipment limit of detection (0.1l/hr). Where negative flows recorded, these are converted to positive values for calculation of Qhg.

METEOROLOGICAL AND SITE INFORMATION:

(Select correct box with X or enter data, as applicable)

State of ground: Dry Moist Wet Snow Frozen
 Wind: Calm Light Moderate Strong
 Cloud cover: None Slight Cloudy Overcast
 Precipitation: None Slight Moderate Heavy
 Time monitoring performed: 09:30 Start 12:00 End
 Barometric pressure (mbar): 1009 Start 1008 End
 Pressure trend (Daily): Falling Steady Rising
 Source: <https://www.timeanddate.com/weather/uk/huddersfield/historic>
 Air Temperature (Deg. C): 9 Before 10 After

INSTRUMENTATION TECHNICAL SPECIFICATIONS:

Ground gas meter: GMF430 (BM36)
Gas Range: CH₄ 0 - 100% CO₂ 0 - 100% O₂ 0 - 25%
Gas Flow range: +100/-50 l/hour
Differential Pressure: (+/-) 1000 Pa
Date of last external calibration: 13/05/2024
Date of next external calibration: 13/05/2025

Date of last in-house calibration: 10/04/2024

Ambient air check: CH₄ ND CO₂ ND O₂ 20.3

Ground Gas and Groundwater Monitoring Record Sheet



JOB DETAILS:

Client: Miller Homes
 Site: Hermitage Park, Lepton
 Date: 21/11/2024

Job No: C10281
 Visit No: 2 of 9
 Operator: RT/CP

Project Manager: GH

Monitoring Point	GAS CONCENTRATIONS												VOLATILES		FLOW DATA			Qhg per borehole		WELL AND WATER DATA					Comments	
	Methane (%v/v)		%LEL		Carbon dioxide (%v/v)		Carbon monoxide (ppmv)		Hydrogen sulphide (ppmv)		Oxygen (%v/v)		PID Peak (ppm)	Product thickness (mm)	Flow rate (l/hr)		Differential borehole Pressure (Pa)	Time for flow to equalise (secs)	Methane (l/hr)	CO2 (l/hr)	Water level (mbgl)	Depth of well (m)	Top of BH (mAOD)	Water level (mAOD)		Response Zone
	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Min.	Steady			Peak	Steady										
BH104	ND	ND	ND	ND	ND	ND	1	ND	1	ND	19.7	19.7	ND	NR	1.3	1.2	5.0	10	0.0013	0.0012	8.33	9.00	137.10	128.77		
BH105	ND	ND	ND	ND	1.7	1.7	2	1	1	ND	5.2	5.2	ND	NR	0.6	0.4	2.0	120	0.0006	0.0068	DRY	8.96	139.60	DRY		
BH109	ND	ND	ND	ND	1.9	1.9	1	ND	1	ND	13.3	13.3	ND	NR	0.5	0.4	1.0	180	0.0005	0.0076	17.63	17.96	131.70	114.07		
BH111	ND	ND	ND	ND	1.4	1.4	1	1	1	1	15.5	15.5	ND	NR	0.7	0.6	2.0	60	0.0007	0.0084	DRY	25.02	136.70	DRY		
BH114	ND	ND	ND	ND	1.2	1.2	1	ND	1	ND	14.5	14.4	ND	NR	0.7	0.4	2.0	120	0.0007	0.0048	NR	5.23	135.80	NR	Stuck Bung	
BH116	ND	ND	ND	ND	0.4	0.4	1	ND	ND	ND	17.7	17.7	ND	NR	0.4	0.3	1.0	180	0.0004	0.0012	DRY	5.82	135.00	DRY		
BH118	ND	ND	ND	ND	1.5	1.5	2	ND	2	ND	12.2	12.2	ND	NR	0.3	0.2	ND	60	0.0003	0.0030	19.33	20.00	133.20	113.87		
BH125	ND	ND	ND	ND	0.7	0.7	1	ND	1	ND	17.4	17.4	ND	NR	0.4	0.3	1.0	120	0.0004	0.0021	8.57	9.43	138.10	129.53		
BH135	ND	ND	ND	ND	0.4	0.4	1	ND	1	ND	18.4	18.4	ND	NR	0.2	0.2	ND	10	0.0002	0.0008	DRY	4.79	128.20	DRY		
BH136	ND	ND	ND	ND	2.1	2.1	1	ND	1	ND	15.4	15.4	ND	NR	0.4	0.2	1.0	180	0.0004	0.0042	DRY	4.88	128.20	DRY		
Max	ND	ND	ND	ND	2.1	2.1	2	1	2	1	19.7	19.7	ND	NR	1.3	1.2	5.0	180	0.0013	0.0084	19.33			129.53		
Min	ND	ND	ND	ND	ND	ND	1	ND	ND	ND	5.2	5.2	ND	NR	0.2	0.2	ND	10	0.0002	0.0008	DRY			DRY		

ND - Not detected

NR - Not recorded

NB: Where no flow (ND) recorded, Qhg values are calculated using equipment limit of detection (0.1l/hr). Where negative flows recorded, these are converted to positive values for calculation of Qhg.

METEOROLOGICAL AND SITE INFORMATION:

(Select correct box with X or enter data, as applicable)

State of ground: Dry Moist Wet Snow Frozen
 Wind: Calm Light Moderate Strong
 Cloud cover: None Slight Cloudy Overcast
 Precipitation: None Slight Moderate Heavy
 Time monitoring performed: 09:20 Start 11:40 End
 Barometric pressure (mbar): 999 Start 997 End
 Pressure trend (Daily): Falling Steady Rising
 Source: <https://www.timeanddate.com/weather/uk/huddersfield/historic>
 Air Temperature (Deg. C): -1 Before 1 After

INSTRUMENTATION TECHNICAL SPECIFICATIONS:

Ground gas meter: GMF430 (BM36)
 Gas Range: CH₄ 0 - 100% CO₂ 0 - 100% O₂ 0 - 25%
 Gas Flow range: +100/-50 l/hour
 Differential Pressure: (+/-) 1000 Pa
 Date of last external calibration: 13/05/2024
 Date of next external calibration: 13/05/2025

Date of last in-house calibration: 10/04/2024

Ambient air check: CH₄ ND CO₂ ND O₂ 19.6

PID: LE76

Calibrated range: 5

Calibration gas: Benzene C6H6

Response time: 2 seconds

Accuracy: (+/-) 3% displayed reading

Date of last external calibration: 10/07/2024

Date of last in-house calibration: 10/04/2024

Date of next external calibration: 10/07/2025

Ground Gas and Groundwater Monitoring Record Sheet



JOB DETAILS:

Client: Miller Homes
 Site: Hermitage Park, Lepton
 Date: 05/12/2024

Job No: C10281
 Visit No: 3 of 9
 Operator: RT
 Project Manager: GH

Monitoring Point	GAS CONCENTRATIONS												VOLATILES		FLOW DATA				Qhg per borehole		WELL AND WATER DATA					Comments
	Methane (%v/v)		%LEL		Carbon dioxide (%v/v)		Carbon monoxide (ppmv)		Hydrogen sulphide (ppmv)		Oxygen (%v/v)		PID Peak (ppm)	Product thickness (mm)	Flow rate (l/hr)		Differential borehole Pressure (Pa)	Time for flow to equalise (secs)	Methane (l/hr)	CO2 (l/hr)	Water level (mbgl)	Depth of well (m)	Top of BH (mAOD)	Water level (mAOD)	Response Zone	
	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Min.	Steady			Peak	Steady										
BH104	ND	ND	ND	ND	3.8	3.8	2	1	1	ND	10.3	10.3	ND	NR	0.8	0.7	3.0	20	0.0008	0.0266	8.01	9.00	137.10	129.09		
BH105	ND	ND	ND	ND	0.9	0.9	2	1	1	ND	5.7	5.7	ND	NR	ND	ND	ND	NR	0.0001	0.0009	7.19	8.96	139.60	132.41		
BH109	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	131.70	NR	Inaccessible	
BH111	ND	ND	ND	ND	0.5	0.5	2	1	1	ND	18.8	18.8	ND	NR	0.2	0.1	ND	5	0.0002	0.0005	24.34	25.02	136.70	112.36		
BH114	ND	ND	ND	ND	1.6	1.6	2	1	1	ND	12.4	12.4	ND	NR	ND	ND	ND	NR	0.0001	0.0016	NR	NR	135.80	NR	Bung stuck in pipe	
BH116	ND	ND	ND	ND	ND	ND	2	1	1	ND	19.8	19.8	ND	NR	ND	ND	ND	NR	0.0001	0.0001	4.77	5.82	135.00	130.23		
BH118	ND	ND	ND	ND	0.4	0.4	2	2	2	ND	18.1	18.1	ND	NR	ND	ND	ND	NR	0.0001	0.0004	19.04	20.00	133.20	114.16		
BH125	ND	ND	ND	ND	0.6	0.6	2	1	1	ND	16.0	16.0	ND	NR	ND	ND	ND	NR	0.0001	0.0006	8.25	9.43	138.10	129.85		
BH135	ND	ND	ND	ND	ND	ND	1	1	1	ND	20.0	20.0	ND	NR	ND	ND	ND	NR	0.0001	0.0001	4.40	4.79	128.20	123.80		
BH136	ND	ND	ND	ND	1.2	1.2	2	1	1	ND	15.3	15.4	ND	NR	ND	ND	ND	NR	0.0001	0.0012	3.75	4.88	128.20	124.45		
Max	ND	ND	ND	ND	3.8	3.8	2	2	2	ND	20.0	20.0	ND	NR	0.8	0.7	3.0	20	0.0008	0.0266	24.34			132.41		
Min	ND	ND	ND	ND	ND	ND	1	1	1	ND	5.7	5.7	ND	NR	0.2	0.1	ND	5	0.0001	0.0001	3.75			112.36		

ND - Not detected

NR - Not recorded

NB: Where no flow (ND) recorded, Qhg values are calculated using equipment limit of detection (0.1l/hr). Where negative flows recorded, these are converted to positive values for calculation of Qhg.

METEOROLOGICAL AND SITE INFORMATION:

(Select correct box with X or enter data, as applicable)

State of ground: Dry Moist Wet Snow Frozen
 Wind: Calm Light Moderate Strong
 Cloud cover: None Slight Cloudy Overcast
 Precipitation: None Slight Moderate Heavy
 Time monitoring performed: 12:30 Start 02:30 End
 Barometric pressure (mbar): 1001 Start 997 End
 Pressure trend (Daily): Falling Steady Rising
 Source: <https://www.timeanddate.com/weather/uk/huddersfield/historic>
 Air Temperature (Deg. C): 9 Before 10 After

INSTRUMENTATION TECHNICAL SPECIFICATIONS:

Ground gas meter: GMF430 (BM36)
 Gas Range: CH₄ 0 - 100% CO₂ 0 - 100% O₂ 0 - 25%
 Gas Flow range: +100/-50 l/hour
 Differential Pressure: (+/-) 1000 Pa
 Date of last external calibration: 13/05/2024
 Date of next external calibration: 13/05/2025

Date of last in-house calibration: 10/04/2024

Ambient air check: CH₄ ND CO₂ ND O₂ 20.2

PID: LE76

Calibrated range: 5
 Calibration gas: Benzene C6H6
 Response time: 2 seconds
 Accuracy: (+/-) 3% displayed reading
 Date of last external calibration: 10/07/2024
 Date of next external calibration: 10/07/2025

Date of last in-house calibration: 10/04/2024

Ground Gas and Groundwater Monitoring Record Sheet



JOB DETAILS:

Client: Miller Homes
 Site: Hermitage Park, Lepton
 Date: 17/12/2024

Job No: C10281
 Visit No: 4 of 9
 Operator: RT
 Project Manager: GH

Monitoring Point	GAS CONCENTRATIONS												VOLATILES		FLOW DATA				Qhg per borehole		WELL AND WATER DATA					Comments
	Methane (%v/v)		%LEL		Carbon dioxide (%v/v)		Carbon monoxide (ppmv)		Hydrogen sulphide (ppmv)		Oxygen (%v/v)		PID Peak (ppm)	Product thickness (mm)	Flow rate (l/hr)		Differential borehole Pressure (Pa)	Time for flow to equalise (secs)	Methane (l/hr)	CO2 (l/hr)	Water level (mbgl)	Depth of well (m)	Top of BH (mAOD)	Water level (mAOD)	Response Zone	
	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Min.	Steady			Peak	Steady										
BH104	ND	ND	ND	ND	3.3	3.3	2	ND	1	ND	16.0	16.0	ND	NR	ND	ND	ND	NR	0.0001	0.0033	7.86	9.00	137.10	129.24		
BH105	ND	ND	ND	ND	0.9	0.9	2	1	1	ND	15.3	15.3	ND	NR	ND	ND	ND	NR	0.0001	0.0009	7.02	8.96	139.60	132.58		
BH109	ND	ND	ND	ND	0.8	0.8	2	ND	1	ND	17.4	17.4	ND	NR	ND	ND	ND	NR	0.0001	0.0008	14.97	17.96	131.70	116.73		
BH111	ND	ND	ND	ND	0.8	0.8	2	1	2	ND	17.5	17.5	ND	NR	ND	ND	ND	NR	0.0001	0.0008	24.31	25.02	136.70	112.39		
BH114	ND	ND	ND	ND	ND	ND	2	1	1	ND	19.2	19.2	ND	NR	ND	ND	ND	NR	0.0001	0.0001	NR	NR	135.80	NR		
BH116	ND	ND	ND	ND	0.1	0.1	2	ND	1	ND	17.1	17.1	ND	NR	ND	ND	ND	NR	0.0001	0.0001	5.19	5.82	135.00	129.81		
BH118	ND	ND	ND	ND	0.3	0.3	2	ND	1	ND	18.4	18.4	ND	NR	ND	ND	ND	NR	0.0001	0.0003	19.05	20.00	133.20	114.15		
BH125	ND	ND	ND	ND	0.6	ND	4	1	1	ND	17.7	17.7	ND	NR	ND	ND	ND	NR	0.0001	0.0001	8.20	9.43	138.10	129.90		
BH135	ND	ND	ND	ND	ND	ND	4	2	2	ND	19.8	19.8	ND	NR	ND	ND	ND	NR	0.0001	0.0001	4.50	4.79	128.20	123.70		
BH136	ND	ND	ND	ND	1.4	1.4	2	1	1	ND	15.7	15.7	ND	NR	ND	ND	ND	NR	0.0001	0.0014	2.90	4.88	128.20	125.30		
Max	ND	ND	ND	ND	3.3	3.3	4	2	2	ND	19.8	19.8	ND	NR	ND	ND	ND	NR	0.0001	0.0033	24.31			132.58		
Min	ND	ND	ND	ND	ND	ND	2	ND	1	ND	15.3	15.3	ND	NR	ND	ND	ND	NR	0.0001	0.0001	2.90			112.39		

ND - Not detected

NR - Not recorded

NB: Where no flow (ND) recorded, Qhg values are calculated using equipment limit of detection (0.1l/hr). Where negative flows recorded, these are converted to positive values for calculation of Qhg.

METEOROLOGICAL AND SITE INFORMATION:

(Select correct box with X or enter data, as applicable)

State of ground: Dry Moist Wet Snow Frozen
 Wind: Calm Light Moderate Strong
 Cloud cover: None Slight Cloudy Overcast
 Precipitation: None Slight Moderate Heavy
 Time monitoring performed: 09:30 Start 11:40 End
 Barometric pressure (mbar): 1003 Start 1001 End
 Pressure trend (Daily): Falling Steady Rising
 Source: <https://www.timeanddate.com/weather/uk/huddersfield/historic>
 Air Temperature (Deg. C): 8 Before 9 After

INSTRUMENTATION TECHNICAL SPECIFICATIONS:

Ground gas meter: GMF430 (BM36)
 Gas Range: CH₄ 0 - 100% CO₂ 0 - 100% O₂ 0 - 25%
 Gas Flow range: +100/-50 l/hour
 Differential Pressure: (+/-) 1000 Pa
 Date of last external calibration: 13/05/2024
 Date of next external calibration: 13/05/2025

Date of last in-house calibration: 10/04/2024

Ambient air check: CH₄ ND CO₂ ND O₂ 19.6

PID: LE76

Calibrated range: 5
 Calibration gas: Benzene C6H6
 Response time: 2 seconds
 Accuracy: (+/-) 3% displayed reading
 Date of last external calibration: 10/07/2024
 Date of next external calibration: 10/07/2025

Date of last in-house calibration: 10/04/2024

APPENDIX G

Sirius Generic Assessment Criteria



SIRIUS GENERIC ASSESSMENT CRITERIA

Context

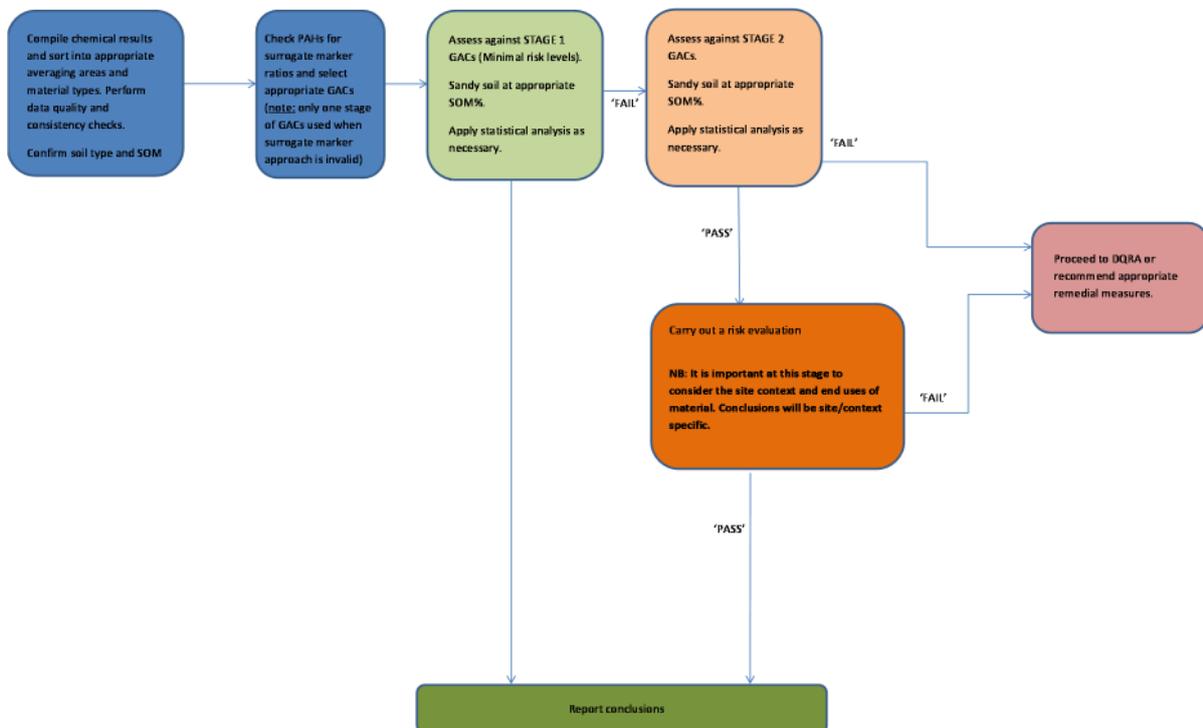
The framework for conducting site investigations, risk assessments and undertaking any necessary remedial works in the UK is provided by Environment Agency report CLR11 “Model Procedures for the Management of Contaminated Land”. This presents a phased approach to risk assessment, involving: identification and qualitative assessment of potential pollutant linkages (source-pathway-receptor relationships) by means of a Conceptual Site Model; Generic Quantitative Risk Assessment (GQRA) of potentially significant pollutant links by comparing contaminant concentrations with appropriate Generic Assessment Criteria (GAC) values; and, if required, a Detailed Quantitative Risk Assessment (DQRA) based on site-specific conditions.

Assessment of Risk to Human Health

Introduction

A staged approach to GQRA has been adopted by Sirius for the evaluation of soil concentration data, as shown schematically in Figure 1.

Figure 1. GQRA Process.





The first stage of GQRA comprises assessment of the data against GAC values derived using toxicological parameter values based on “minimum risk”. Any contaminants exceeding their GACs at this stage are further assessed against Stage 2 GACs, which have been derived using Low Level of Toxicological Concern (LLTC) criteria, where these are available.

With appropriate justification, a contaminant concentration that does not exceed the relevant Stage 2 GAC value may be considered to indicate that the land is “suitable for use”. The appropriate use of LLTC-based criteria within the planning regime is considered reasonable by government agencies, as most recently highlighted in the letter (dated 3rd September 2014) to all local authorities from Lord de Mauley, Parliamentary Under Secretary at DEFRA.

A narrative “risk evaluation” must therefore accompany any Stage 2 assessment to justify the conclusions drawn. Where appropriate, this may provide a basis for eliminating from further consideration those contaminants whose concentrations do not exceed the applicable Stage 2 GAC value.

For the specific case of lead, the Category 4 Screening Level criteria given in CL:AIRE (2014)¹ have been adopted directly as GACs, as these are considered to be based on expert interpretation of current toxicological evidence.

In some areas, background concentrations of lead, other metals and metalloids, and/or individual PAHs may exceed their respective GACs and it may be appropriate to consider relative site and background concentration data as part of a more detailed assessment of the data.

Derivation of GACs

Except where otherwise stated, GACs have been derived by Sirius using CLEA version 1.071.

The GAC values have been derived for a sandy soil type, which will be conservative for the majority of soils (including made ground) encountered on historically contaminated sites. For organic contaminants of concern, criteria have been derived for a number of Soil Organic Matter (SOM) contents.

Genotoxic PAHs are assessed by the “Surrogate Method” using benzo(a)pyrene. Further information on this approach is given below.

Unless specifically stated, chemical properties and Health Criteria Values (HCVs) were obtained from:

- Environment Agency Science Report SC050021 series;
- Nathanail *et al.* (2009) “The LQM/CIEH Generic Assessment Criteria for Human Health Risk Assessment”, 2nd edition, Land Quality Press, Nottingham;
- CL:AIRE - AGS - EIC (2010) “Soil Generic Assessment Criteria for Human Health Risk Assessment”. CL:AIRE, London.

GACs for arsenic, benzene, benzo(a)pyrene, cadmium and chromium (VI) have been derived using the

¹ CL:AIRE (2014) “Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination”, Report SP1010, rev. 2.



Low Level of Toxicological Concern (LLTC) criteria given in CL:AIRE (2013). These criteria are considered a reasonable basis for assessment as they are still highly precautionary and definitely do not approach an intake level that could be defined as approaching Significant Possibility of Significant Harm to human health in the context of Part 2A of the Environmental Protection Act 1990. It must be further understood that the GACs derived will still incorporate a residual level of conservatism resulting from the exposure parameters used and the assumptions inherent in the model algorithms.

GACs for Genotoxic PAHs

Our approach to the assessment of genotoxic PAHs retains the use of benzo(a)pyrene as a surrogate marker. This approach for genotoxic PAHs is recommended by the HPA (2010)², which we consider to be the authoritative current guidance produced by a UK expert body and note that it was retained in the DEFRA Category 4 Screening Levels project (CL:AIRE, 2014).

The surrogate marker approach allows the assessment of the combined carcinogenic risk associated with all genotoxic PAHs³ present as a mixture within soil, even though detailed toxicological information for many of the individual compounds may be lacking. The approach is based on determining the risk posed by the genotoxic PAH mixture using the concentration of benzo(a)pyrene present as an indicator.

To use the GAC for benzo(a)pyrene as a surrogate marker, a number of requirements must be met (HPA, 2010):

- Benzo(a)pyrene must be present in all soil samples containing genotoxic PAHs for which this method of assessment is being used;
- A similar profile of the genotoxic PAHs relative to benzo(a)pyrene should be present in all of the samples being assessed;
- The PAH profile of PAHs in the soil samples should be similar to that present in the pivotal toxicity study on which toxicological criterion for benzo(a)pyrene was based (Culp et al., 1998⁴). Table 1 provides the basis for defining the acceptable range.

Data indicate that contaminated soils in the UK generally meet these criteria⁵ but the assessor must review their dataset before adopting this approach. If the above criteria are not met, then the surrogate marker approach must not be adopted and individual GAC or SSAC values are to be applied.

² HPA (2010) "Risk Assessment Approaches for Polycyclic Aromatic Hydrocarbons (PAHs)", version 5.

³ The genotoxic PAHs included in the USEPA PAH 16 analysis reported by analytical labs are: benz[a]anthracene, benzo[b]fluoranthene, benzo[k]fluoranthene, benzo[g,h,i]perylene, benzo(a)pyrene, chrysene, dibenz[a,h]anthracene and indeno[1,2,3-c,d]pyrene.

⁴ Culp, S. *et al.* (1998) *Carcinogenesis*, 19, 117-124.

⁵ Bull, S. & Collins, C. (2013) *Environ. Geochem. Health*, 31, 101-109.



Table 1. Profile of Genotoxic PAHs Relative to Benzo(a)pyrene that are Considered Acceptable for Application of Benzo(a)pyrene as a Surrogate Marker.

PAH	Acceptable Ratio of PAH Concentration to Benzo(a)pyrene for Application of Surrogate Marker Assessment	
	Lower Limit	Upper Limit
Benz[a]anthracene	0.12	12.43
Benzo[b]fluoranthene	0.11	10.85
Benzo[k]fluoranthene	0.04	3.72
Benzo[g,h,i]perylene	0.08	8.22
Chrysene	0.12	11.61
Dibenz[a,h]anthracene	0.01	1.38
Indeno[1,2,3-c,d]pyrene	0.07	7.27

For further information see: HPA (2010).

Soil Criteria Set for Purposes Other Than Human Health Protection

The Sirius GACs for sulphate, total organic carbon (TOC) and calorific value are set on basis of risks other than human health and their exceedance does not indicate a potential risk to future site users:

- The GAC for sulphate content is based on potential detrimental effects on buried concrete⁶ and must be assessed with reference to the soil pH;
- The GAC for TOC content is provided for indicative assessment of disposal options if off-site landfill of soil were to be considered. This GAC is set at the 'Inert' waste threshold and should be considered as being applied for information purposes only;
- The GAC for calorific value is set to assist in an initial assessment of the potential fire risk posed by made ground or natural soils containing elevated concentrations of potentially combustible organic matter.

Assessment criteria more stringent than those for human health may be set for specific purposes, for example, elimination of nuisance odours or ensuring that potentially mobile free-phase organic products are not present.

Controlled Waters

The Environment Agency's "Remedial Targets Methodology" (2006) provides a framework for assessing the potential for pollution of controlled waters and for deriving remedial target concentrations in soil and groundwater.

There are no generic groundwater or surface water quality standards that are applicable to all sites. Drinking Water Standards and Environmental Quality Standards (EQS) are used by Sirius as assessment criteria where they are appropriate to the contaminant linkages under consideration. Given that these standards apply at the receptor point, this is a conservative approach for samples collected at a source or along a transport pathway.

⁶ BRE (2005) "Concrete in Aggressive Ground", Special Digest No. 1; 3rd Edition.



Soil Leachability

Sirius specifies that the analytical laboratory undertakes leachate preparation by BS EN 12475-2:2002. Where specific circumstances require a different method to be used, then this will be explained and justified within the report body text.

The results of leachate analysis are compared to the relevant GAC values for controlled waters.



The Sirius Group Stage 1 Generic Assessment Criteria for Soils

Revision:

24 January 2020

Parameter	Residential (mg/kg, unless otherwise stated)						Commercial / Industrial (mg/kg, unless otherwise stated)			Note	
	With Homegrown Produce			Without Homegrown Produce			1% SOM	2.5% SOM	5% SOM		
	1% SOM	2.5% SOM	5% SOM	1% SOM	2.5% SOM	5% SOM					
Metals/Metalloids											
Arsenic (inorganic)	37			40			630			[1]	
Cadmium	11			85			190			[2]	
Chromium (III)	910			4000			8600				
Chromium (VI)	6.0			6.1			33			[3]	
Copper	200			7100			68000			[4]	
Lead	200			310			2300			[5]	
Mercury (inorganic)	40			56			1100			[6]	
Nickel	130			180			980			[7]	
Selenium	250			430			12000				
Vanadium	410			1200			9000				
Zinc	450			40000			750000			[4]	
Other Inorganics											
pH	<5 or >9			<5 or >9			<5 or >9				
Total Sulphate	2400			2400			2400			[8]	
Water-Soluble Sulphate	0.5 g/l			0.5 g/l			0.5 g/l			[8]	
Free Cyanide	34			34			1400			[9]	
Organics											
PAHs											
Acenaphthene	200	490	920	2000	3600	4900	75000	92000	100000		
Acenaphthylene	170	400	760	2000	3600	4900	76000	93000	100000		
Anthracene	2300	5300	9400	30000	34000	36000	520000	540000	540000	[10]	
Benzo(a)anthracene	Assessed using benzo(a)pyrene as a surrogate marker										[10]
Benzo(a)pyrene	2.1	2.1	2.2	2.3	2.3	2.3	27	27	27	[11]	
Benzo(b)fluoranthene	Assessed using benzo(a)pyrene as a surrogate marker										[10]
Benzo(k)fluoranthene	Assessed using benzo(a)pyrene as a surrogate marker										[10]
Benzo(g,h,i)perylene	Assessed using benzo(a)pyrene as a surrogate marker										[10]
Chrysene	Assessed using benzo(a)pyrene as a surrogate marker										[10]
Dibenzo(a,h)anthracene	Assessed using benzo(a)pyrene as a surrogate marker										[10]
Fluoranthene	280	560	820	1500	1600	1600	23000	23000	23000		
Fluorene	170	390	730	2200	3400	4000	60000	67000	70000		
Indeno(1,2,3-c,d)pyrene	Assessed using benzo(a)pyrene as a surrogate marker										[10]
Naphthalene	1.0	2.3	4.6	1.0	2.4	4.7	110	260	510		
Phenanthrene	95	220	380	1300	1400	1500	22000	22000	23000		
Pyrene	620	1200	1900	3700	3800	3800	54000	54000	54000		
BTEX and related											
Benzene	0.063	0.13	0.24	0.16	0.30	0.38	15	28	49		
Toluene	100	240	460	370	830	1100	33000	68000	110000		
Ethylbenzene	26	62	120	34	81	110	3200	7400	14000		
Xylenes (total)	28	67	130	33	78	110	3200	7700	15000	[12]	
1,2,4-trimethylbenzene	0.22	0.53	1.1	0.24	0.58	1.2	39	93	170		
Iso-propylbenzene	6.6	16	32	6.8	17	33	1300	3100	6100		
Propylbenzene	21	51	100	23	57	110	3800	9100	17000		
Styrene	6.9	16	32	21	49	93	3100	6100	9500		
TPH											
Aliphatic EC 5-6	24	41	68	24	41	68	2400	4100	6900		
Aliphatic EC >6-8	53	110	210	53	110	210	5300	11000	21000		
Aliphatic EC >8-10	13	31	61	13	31	61	1300	3100	6000		
Aliphatic EC >10-12	62	150	300	62	150	300	6100	15000	28000		
Aliphatic EC >12-16	510	1200	2300	510	1200	2300	43000	72000	85000		
Aliphatic EC >16-35	41000	70000	90000	42000	70000	90000	>1E6	>1E6	>1E6	[13]	
Aromatic EC >5-7	53	110	200	150	300	538	15000	28000	48000		
Aromatic EC >7-8	100	240	460	370	820	1500	33000	68000	110000		
Aromatic EC >8-10	20	48	94	22	54	100	2200	5200	9800		
Aromatic EC >10-12	63	150	290	120	290	560	11000	22000	30000		
Aromatic EC >12-16	140	320	570	1100	1900	2200	35000	37000	37000		
Aromatic EC >16-21	260	540	840	1800	1900	1900	28000	28000	28000		
Aromatic EC >21-35	1100	1500	1700	1900	1900	1900	28000	28000	28000		
Chlorinated Organics											
Chlorobenzene	0.19	0.44	0.86	0.19	0.45	0.87	31	71	140		
Dichloromethane (DCM)	0.47	0.78	1.2	1.2	1.7	2.4	250	340	470		
1,1-dichloroethane (DCA)	1.4	2.4	4.0	1.4	2.4	4.1	260	420	690		
1,2-dichloroethane (DCA)	0.0031	0.0048	0.0076	0.0035	0.0053	0.0084	0.34	0.51	0.81		
1,1-dichloroethene (DCE)	0.15	0.26	0.45	0.15	0.26	0.46	24	43	74		
cis-1,2-dichloroethene (DCE)	0.066	0.12	0.20	0.069	0.12	0.21	14	23	38		
trans-1,2-dichloroethene (DCE)	0.11	0.21	0.38	0.12	0.22	0.39	21	37	65		
Pentachlorophenol	0.21	0.52	1.0	27	30	31	400	400	400		
1,1,1,2-tetrachloroethane	0.56	1.3	2.6	0.63	1.5	2.9	59	140	270		

Parameter	Residential (mg/kg, unless otherwise stated)						Commercial / Industrial (mg/kg, unless otherwise stated)			Note
	With Homegrown Produce			Without Homegrown Produce			1% SOM	2.5% SOM	5% SOM	
	1% SOM	2.5% SOM	5% SOM	1% SOM	2.5% SOM	5% SOM				
1,1,2,2-tetrachloroethane	0.98	2.1	4.0	1.6	3.4	6.3	150	310	570	
Tetrachloroethene (PCE)	0.074	0.17	0.32	0.07	0.17	0.33	10	23	45	
Tetrachloromethane (CT)	0.011	0.024	0.046	0.011	0.024	0.046	1.6	3.6	6.9	
1,1,1-trichloroethane (TCA)	3.7	7.8	15	3.8	7.9	15	370	770	1400	
1,1,2-trichloroethane (TCA)	0.39	0.85	1.6	0.51	1.1	2.0	89	180	320	
Trichloroethene (TCE)	0.0070	0.015	0.028	0.0071	0.015	0.028	1.5	2.8	44	
Trichloromethane (CF)	0.43	0.80	1.4	0.48	0.89	53	98	170	300	
Vinyl Chloride	0.00034	0.00045	0.00062	0.00037	0.00048	0.00066	0.038	0.049	0.068	
Miscellaneous Organics										
Carbon disulphide	0.066	0.13	0.25	0.066	0.13	0.25	6.7	14	25	
Di-(2-ethylhexyl)-phthalate	290	660	1100	3900	4000	4100	85000	85000	8600	
MTBE	31	55	94	39	68	120	7400	12000	19000	
Phenol	110	190	330	420	440	440		440		[14]
Methylphenols (cresols), total	78	170	330	5600	8200	9900	160000	170000	18000	[15]
2,4-dimethylphenol (m-xylene)	18	43	82	200	430	720	15000	23000	28000	
Other Parameters										
TOC	3% w/w			3% w/w			3% w/w			[16]
Calorific Value	2 MJ/kg			2 MJ/kg			2 MJ/kg			[17]
Asbestos	Fibres present			Fibres present			Fibres present			

All concentration-based criteria are rounded to 2 significant figures.

The criteria assume a sandy soil type, which will be conservative for the great majority of soils (including made ground) encountered on historically contaminated sites.

Except where otherwise stated, criteria have been derived by Sirius using CLEA version 1.06. Parameters for the land use cases are consistent with those given in Environment Agency (2009) "Updated Technical Background to the CLEA Model", report SC050021/SR3 but updated (where relevant) for respiration rate, exposure frequency for dermal contact outdoors, soil adherence factors for children, and plant uptake concentration factors given in CL:AIRE (2014) and Nathanail et al., (2015). No correction has been made for the "Top Two" crop types in the Residential with Homegrown Produce land use and the criteria will therefore be conservative in this regard.

Health Criteria Values (HCVs) and (except where specifically noted) chemical property data were obtained from:

- Environment Agency Science Report SC050021 Series;
- Nathanail et al. (2015);
- CL:AIRE-AGS-EIC (2010).

Footnotes

[1] Based on oral GAC as this is the lower GAC and reflects a cancer risk many orders of magnitude greater than for inhalation.

[2] Determined for lifetime exposure. Plant uptake concentration factors applied were as given in CL:AIRE (2014). The GAC values are based on data for soils having a pH value in the range 6-8; caution should be applied in applying them at pH values outside this range, especially at pH values <5.

[3] Both oral and inhalation HCVs are based on local toxicological effects and therefore the lowest (oral) GAC value is adopted.

[4] For the Residential with Homegrown Produce land use, the GAC values for Cu and Zn are based on potential phytotoxic effects and have been set at the maximum allowable concentrations for sewage sludge-amended soils presented in the "Sludge (Use in Agriculture) Regulations" (SI 1263/1989); these criteria may also be applied in any land use where plants are to be grown. The equivalent GAC values for human health protection in the Residential with Homegrown Produce land use are around an order of magnitude greater.

[5] The Category 4 Screening Levels for lead defined in CL:AIRE (2013) have been adopted directly to provide an acceptable basis for initial assessment of data. Where background concentrations of lead exceed the GAC value, then site-specific evaluation will be required.

[6] The SGV for mercury is based on inorganic mercury which represents the most common form encountered within the environment. This is considered appropriate for most sites as: "...the SGV for inorganic mercury can normally be compared with chemical analysis for total mercury content because the equilibrium concentrations of elemental and methylmercury compounds are likely to be very low" (Environment Agency report SC050021/Mercury SGV). Analysis and specific assessment for elemental or methylated forms of mercury will need to be considered if historical land use or site-specific factors indicate that these forms of mercury are likely to be present.

[7] Toxicological effects by inhalation are localised, therefore the lower of the GAC values for oral and inhalation HCVs have been adopted.

[8] BRE (2005). Sulphate is not considered to pose a potential risk to human health under normal circumstances – this GAC applies to construction cases only and is set at the upper limit for DS-1 Design Sulphate Class concrete.

[9] GAC calculated for acute risk. Further information can be provided upon request.

[10] The genotoxic PAHs (benz(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(g,h,i)perylene, chrysene, dibenz(a,h)anthracene, indeno(1,2,3-c,d)pyrene) are routinely assessed using benzo(a)pyrene as a surrogate (HPA (2010) "Risk Assessment Approaches for Polycyclic Aromatic Hydrocarbons (PAHs)", version 5). Separate information on this approach is provided.

[11] Calculated using a 'minimum risk' oral index dose derived from the application of a 10,000x safety factor to the BMD10 presented in CL:AIRE (2014) for benzo(a)pyrene as a surrogate marker and the inhalation index dose specified in CL:AIRE (2014) and Nathanail et al. (2015). As a conservative measure, the GAC is based on combined exposure pathways to account for systemic carcinogenic effects. Further information on the derivation can be provided upon request.

[12] For screening purposes, a single GAC has been set for total xylene. This is the lowest of the values calculated for the three individual xylene isomers.

[13] "No GAC" indicates that no value has been specified for this land use as the TDSI cannot be exceeded at achievable soil concentrations.

[14] 440mg/kg is the minimum concentration that is protective for direct skin contact with phenol (See Environment Agency SR050021/Phenol SGV) and is adopted where GACs for chronic exposure are higher.

[15] For screening purposes, a single GAC has been set for total methylphenol. This is the lowest of the values calculated for the three individual methylphenol isomers.

[16] The Hazardous Waste (England and Wales) Regulations 2005. TOC content in itself does not represent a potential risk to human health. This GAC is provided for indicative assessment of disposal options, in the case that off-site landfill of soil is undertaken. This GAC is specified at the 'Inert' waste threshold and should be considered as for information purposes only.

[17] ICRCL (1986) Guidance Note 61/84, 2nd Edition, Notes on the Fire Hazards of Contaminated Land. Calorific value is not an indication of direct human health risk but may be useful in assessment of the potential fire risk posed by made ground or natural soils containing elevated concentrations of potentially combustible organic matter.

The Sirius Group

Stage 2 Generic Assessment Criteria for Soils in Public Open Space Settings

Revision: 20th August 2015

Parameter	Informal POS in Residential Setting (mg/kg, unless otherwise stated)			Park POS (mg/kg, unless otherwise stated)			Note
	1% SOM	2.5% SOM	5% SOM	1% SOM	2.5% SOM	5% SOM	
	Metals/Metalloids						
Arsenic (inorganic)	79			170			[1]
Cadmium	220			840			[2]
Chromium (III)	1500			33000			
Chromium (VI)	23			250			[3]
Copper	200			200			[4]
Lead	630			1300			[5]
Mercury (inorganic)	120			240			[6]
Nickel	230			800			[7]
Selenium	1100			1800			
Vanadium	2000			5000			
Zinc	450			450			[4]
Other Inorganics							
pH	<5 or >9			<5 or >9			
Total Sulphate	2400			2400			[8]
Water-Soluble Sulphate	0.5 g/l			0.5 g/l			[8]
Free Cyanide	34			34			[9]
Organics							
PAHs							
Acenaphthene	15000	15000	15000	30000	30000	30000	
Acenaphthylene	15000	15000	15000	30000	30000	30000	
Anthracene	74000	74000	74000	150000	150000	150000	[10]
Benzo(a)anthracene	Assessed using benzo(a)pyrene as a surrogate marker						[10]
Benzo(a)pyrene	10	10	10	21	21	22	[11]
Benzo(b)fluoranthene	Assessed using benzo(a)pyrene as a surrogate marker						[10]
Benzo(k)fluoranthene	Assessed using benzo(a)pyrene as a surrogate marker						[10]
Benzo(g,h,i)perylene	Assessed using benzo(a)pyrene as a surrogate marker						[10]
Chrysene	Assessed using benzo(a)pyrene as a surrogate marker						[10]
Dibenzo(a,h)anthracene	Assessed using benzo(a)pyrene as a surrogate marker						[10]
Fluoranthene	3100	3100	3100	6300	6300	6400	
Fluorene	9900	9900	9900	20000	20000	20000	
Indeno(1,2,3-c,d)pyrene	Assessed using benzo(a)pyrene as a surrogate marker						[10]
Naphthalene	3500	3800	4000	1300	1800	2400	
Phenanthrene	3100	3100	3100	6300	6300	6300	
Pyrene	7400	7400	7400	15000	15000	15000	
BTEX and related							
Benzene	140	140	140	140	160	180	[12]
Toluene	55000	56000	56000	90000	97000	100000	
Ethylbenzene	23000	24000	24000	18000	23000	28000	
Xylenes (total)	38000	40000	41000	19000	26000	33000	[13]
1,2,4-trimethylbenzene	240	240	240	220	280	320	
Iso-propylbenzene	24000	24000	24000	14000	20000	24000	
Propylbenzene	24000	24000	25000	27000	33000	37000	
Styrene	3000	3000	3000	5600	5800	5900	
TPH							
Aliphatic EC 5-6	520000	550000	570000	120000	150000	200000	
Aliphatic EC >6-8	560000	580000	600000	170000	250000	330000	
Aliphatic EC >8-10	12000	12000	12000	16000	19000	22000	
Aliphatic EC >10-12	13000	13000	13000	22000	24000	24000	
Aliphatic EC >12-16	13000	13000	13000	25000	25000	26000	
Aliphatic EC >16-35	250000	250000	250000	470000	480000	490000	
Aromatic EC >5-7	55000	55000	55000	78000	87000	93000	
Aromatic EC >7-8	55000	55000	55000	89000	97000	100000	
Aromatic EC >8-10	5000	5000	5000	7700	8800	9300	
Aromatic EC >10-12	5000	5000	5000	9400	9800	10000	
Aromatic EC >12-16	5000	5000	5000	10000	10000	10000	
Aromatic EC >16-21	3800	3800	3800	7700	7800	7800	
Aromatic EC >21-35	3800	3800	3800	7800	7900	7900	
Chlorinated Organics							
Chlorobenzene	8800	10000	12000	1500	2200	3000	
Dichloromethane (DCM)	750	750	750	1400	1400	1400	
1,1-dichloroethane (DCA)	42000	43000	45000	11000	14000	17000	
1,2-dichloroethane (DCA)	28	28	28	22	25	28	
1,1-dichloroethene (DCE)	9200	9600	10000	1900	2500	3200	
cis-1,2-dichloroethene (DCE)	1200	1200	1300	390	490	610	
trans-1,2-dichloroethene (DCE)	3500	3700	3800	910	1200	1500	
Pentachlorophenol	180	180	180	250	270	280	
1,1,1,2-tetrachloroethane	1400	1400	1400	1600	1900	2100	
1,1,2,2-tetrachloroethane	1400	1400	1400	1900	2100	2300	
Tetrachloroethene (PCE)	1300	1400	1400	900	1200	1500	
Tetrachloromethane (CT)	790	850	890	210	310	410	
1,1,1-trichloroethane (TCA)	120000	130000	130000	63000	84000	100000	

The Sirius Group

Stage 2 Generic Assessment Criteria for Soils in Public Open Space Settings

Parameter	Informal POS in Residential Setting (mg/kg, unless otherwise stated)			Park POS (mg/kg, unless otherwise stated)			Note
	1% SOM	2.5% SOM	5% SOM	1% SOM	2.5% SOM	5% SOM	
1,1,2-trichloroethane (TCA)	960	970	980	760	950	1100	
Trichloroethene (TCE)	110	120	120	76	98	120	
Trichloromethane (CF)	2400	2500	2500	2700	2900	3100	
Vinyl Chloride	3.5	3.5	3.5	5.0	5.2	5.5	
Miscellaneous Organics							
Carbon disulphide	9000	10000	11000	1500	2100	2800	
Di-(2-ethylhexyl)-phthalate	9700	9700	9700	16000	16000	16000	
MTBE	73000	73000	73000	70000	81000	92000	
Phenol		440			440		[14]
Methylphenols (cresols), total	25000	25000	25000	47000	49000	50000	[15]
2,4-dimethylphenol (m-xylene)	5000	5000	5000	8700	9200	9600	
Other Parameters							
TOC		3% w/w			3% w/w		[16]
Calorific Value		2 MJ/kg			2 MJ/kg		[17]
Asbestos		Fibres present			Fibres present		

The POS cases defined are based on the specific Conceptual Site Models given in CL:AIRE (2014). For these GACs to be applied, the relevant conceptual model must be valid for the site under assessment.

All concentration-based criteria are rounded to 2 significant figures.

The criteria assume a sandy soil type, which will be conservative for the great majority of soils (including made ground) encountered on historically contaminated sites.

Except where otherwise stated, criteria have been derived by Sirius using CLEA version 1.06. Parameters for the land use cases are consistent with those given in Environment Agency (2009) "Updated Technical Background to the CLEA Model", report SC050021/SR3 but updated (where relevant) for respiration rate, exposure frequency for dermal contact outdoors, soil adherence factors for children, and plant uptake concentration factors given in CL:AIRE (2014) and Nathanail et al. (2015). No correction has been made for the "Top Two" crop types in the Residential with Homegrown Produce land use and the criteria will therefore be conservative in this regard.

Health Criteria Values (HCVs) and (except where specifically noted) chemical property data were obtained from:

- Environment Agency Science Report SC050021 Series;
- CL:AIRE (2014);
- Nathanail et al. (2015);
- CL:AIRE-AGS-EIC (2010).

Footnotes

[1] Determined using LLTC value and plant uptake concentration factors given in CL:AIRE (2014). The oral GAC is adopted as this is the lower value and reflects a cancer risk many orders of magnitude greater than for inhalation.

[2] Determined for lifetime exposure using the LLTC value given in CL:AIRE (2014).

[3] Determined using LLTC value given in CL:AIRE (2014). Both oral and inhalation LLTCs are based on local toxicological effects and therefore the lowest (oral) GAC value is adopted.

[4] The GAC values for Cu and Zn are based on potential phytotoxic effects and have been set at the maximum allowable concentrations for sewage sludge-amended soils presented in the "Sludge (Use in Agriculture) Regulations" (SI 1263/1989); these criteria may also be applied in any land use where plants are to be grown. The GAC values for human health protection are significantly higher.

[5] The Category 4 Screening Levels for lead defined in CL:AIRE (2014) have been adopted directly to provide an acceptable basis for initial assessment of data. Where background concentrations of lead exceed the GAC value, then site-specific evaluation will be required.

[6] The SGV for mercury is based on inorganic mercury which represents the most common form encountered within the environment. This is considered appropriate for most sites as: "...the SGV for inorganic mercury can normally be compared with chemical analysis for total mercury content because the equilibrium concentrations of elemental and methylmercury compounds are likely to be very low" (SC050021/Mercury SGV). Analysis and specific assessment for elemental or methylated forms of mercury will need to be considered if historical land use or site-specific factors indicate that these forms of mercury are likely to be present.

[7] Toxicological effects by inhalation are localised; consistent with the SGV for nickel, the lower of the GAC values for oral and inhalation HCVs have been adopted in each case.

[8] BRE (2005). Sulphate is not considered to pose a potential risk to human health under normal circumstances – this GAC applies to cases where concrete structures may be constructed within the soil and is set at the upper limit for DS-1 Design Sulphate Class concrete.

[9] GAC calculated for acute risk. Further information can be provided upon request.

[10] The genotoxic PAHs (benz(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(g,h,i)perylene, chrysene, dibenz(a,h)anthracene, indeno(1,2,3-c,d)pyrene) are routinely assessed using benzo(a)pyrene as a surrogate (HPA (2010) "Risk Assessment Approaches for Polycyclic Aromatic Hydrocarbons (PAHs)", version 5). Separate information on this approach is provided.

[11] Determined using oral LLTC value (CL:AIRE, 2014) for assessment of all pathways to determine systemic carcinogenic effect; inhalation HCV and LLTC values are based on local pulmonary effects only and result in a less conservative GAC.

[12] Calculated using LLTC value (CL:AIRE, 2014).

[13] For screening purposes, a single GAC has been set for total xylene. This is the lowest of the values calculated for the three individual xylene isomers.

[14] The GAC is based on the threshold protective for acute effects of skin contact with phenol (See SR050021/Phenol SGV). The chronic exposure GAC is significantly higher.

[15] For screening purposes, a single GAC has been set for total methylphenol. This is the lowest of the values calculated for the three individual methylphenol isomers.

[16] The Hazardous Waste (England and Wales) Regulations 2005. TOC content in itself does not represent a potential risk to human health. This GAC is provided for indicative assessment of disposal options, in the case that off-site landfill of soil is undertaken. This GAC is specified at the 'Inert' waste threshold and should be considered as for information purposes only.

[17] ICRCL (1986) Guidance Note 61/84, 2nd Edition, Notes on the Fire Hazards of Contaminated Land. Calorific value is not an indication of direct human health risk but may be useful in assessment of the potential fire risk posed by made ground or natural soils containing elevated concentrations of potentially combustible organic matter.

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