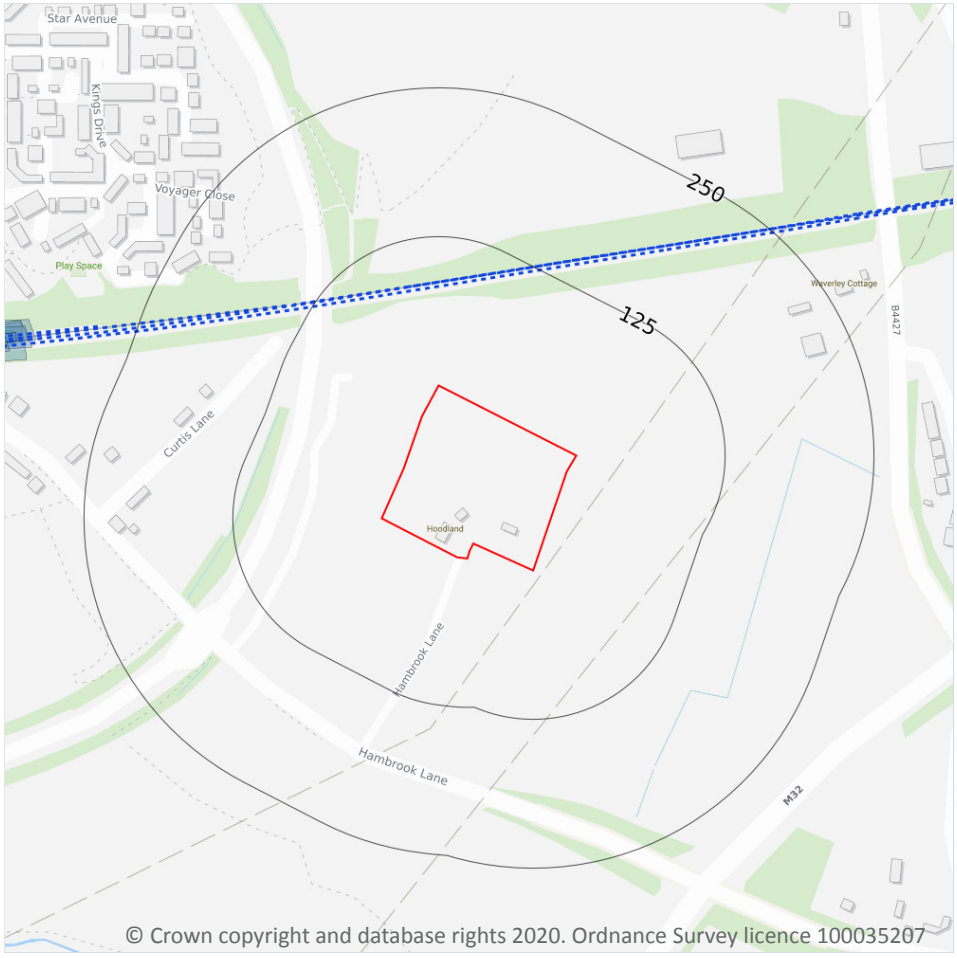
21 Railway infrastructure and projects



Site Outline

Search buffers in metres (m)

- Crossrail 1 Stations
- Crossrail 1 Route
- Crossrail 1 Worksites
- Crossrail 2 Stations
- Crossrail 2 Route
- Crossrail 2 Worksites
- Crossrail 2 Safeguarding
- Crossrail 2 Headhouses
- Railway stations
- Active railways
- Active tunnels
- Abandoned railways
- Historic railways
- Historic tunnels
- Underground stations
- Underground Lines
- Royal Mail tunnels
- HS2 optimised route
- HS2 Stations
- HS2 Depots
- HS2 Surface Safeguarding
- HS2 Subsurface Safeguarding

21.1 Underground railways (London)

Records within 250m	0

Details of all active London Underground lines, including approximate tunnel roof depth and operational hours.

This data is sourced from publicly available information by Groundsure.

21.2 Underground railways (Non-London)

Records within 250m	0

Details of the Merseyrail system, the Tyne and Wear Metro and the Glasgow Subway. Not all parts of all systems are located underground. The data contains location information only and does not include a depth assessment.

This data is sourced from publicly available information by Groundsure.

21.3 Railway tunnels

Records within 250m	0

Railway tunnels taken from contemporary Ordnance Survey mapping.

This data is sourced from the Ordnance Survey.

21.4 Historical railway and tunnel features

Records within 250m	0

Railways and tunnels digitised from historical Ordnance Survey mapping as scales of 1:1,250, 1:2,500, 1:10,000 and 1:10,560.

This data is sourced from Ordnance Survey/Groundsure.

21.5 Royal Mail tunnels

Records within 250m	0

The Post Office Railway, otherwise known as the Mail Rail, is an underground railway running through Central London from Paddington Head District Sorting Office to Whitechapel Eastern Head Sorting Office. The line is 10.5km long. The data includes details of the full extent of the tunnels, the depth of the tunnel, and the depth to track level.

This data is sourced from Groundsure/the Postal Museum.

21.6 Historical railways

Records within 250m	0

Former railway lines, including dismantled lines, abandoned lines, disused lines, historic railways and razed lines.

This data is sourced from OpenStreetMap.

21.7 Railways

Records within 250m	6

Currently existing railway lines, including standard railways, narrow gauge, funicular, trams and light railways.

Features are displayed on the Railway infrastructure and projects map on **page 93**

Location	Name	Type
82m N	-	rail
86m N	-	rail
86m N	Not given	Multi Track
87m N	Not given	Multi Track
143m NW	Not given	Multi Track
187m NE	-	rail

This data is sourced from Ordnance Survey and OpenStreetMap.

21.8 Crossrail 1

Records within 500m	0

The Crossrail railway project links 41 stations over 100 kilometres from Reading and Heathrow in the west, through underground sections in central London, to Shenfield and Abbey Wood in the east.

This data is sourced from publicly available information by Groundsure.

21.9 Crossrail 2

Records within 500m	0

Crossrail 2 is a proposed railway linking the national rail networks in Surrey and Hertfordshire via an underground tunnel through London.

This data is sourced from publicly available information by Groundsure.

21.10 HS2

Records within 500m	0

HS2 is a proposed high speed rail network running from London to Manchester and Leeds via Birmingham. Main civils construction on Phase 1 (London to Birmingham) of the project began in 2019, and it is currently anticipated that this phase will be fully operational by 2026. Construction on Phase 2a (Birmingham to Crewe) is anticipated to commence in 2021, with the service fully operational by 2027. Construction on Phase 2b (Crewe to Manchester and Birmingham to Leeds) is scheduled to begin in 2023 and be operational by 2033.

This data is sourced from HS2 ltd.

Data providers

Groundsure works with respected data providers to bring you the most relevant and accurate information. To find out who they are and their areas of expertise see https://www.groundsure.com/sources-reference.

Terms and conditions

Groundsure's Terms and Conditions can be accessed at this link: https://www.groundsure.com/terms-and-conditions-jan-2020/.

APPENDIX D

Risk Assessment Methodology

CGL Risk Assessment Methodology

The following risk Assessment methodology is based on CIRIA C552 (2001) Contaminated Land Risk Assessment – A Guide to Good Practice[1], in order to quantify potential risk via risk estimation and risk evaluation, which can be adopted at the Phase I stage. This will then determine an overall risk category which can be used to identify likely actions. This methodology uses qualitative descriptors and therefore is a qualitative approach and is undertaken for each potential pollution linkage (source-pathway-receptor) identified for the site in accordance with Contaminated Land Reports 6[2] and 11[3].

The methodology requires the classification of:

- The magnitude of the consequence (severity) of a risk occurring, and
- The magnitude of the probability (likelihood) of a risk occurring.

The potential consequences of contamination risks occurring at this site are classified in accordance with Table 1 below, which is adapted from the CIRIA guidance[1].

Table 1. Classifications of Consequence ratings

Classification	*Definition of Consequence*	*Examples*
Severe	Short-term (acute) risks to human health.	High concentration of cyanide on the surface of an informal recreation area
	Short-term (acute) risk of pollution of sensitive water resource or ecosystem.	Major spillage of contaminants from site into controlled waters
	Catastrophic damage to crops/buildings/property/infrastructure, including off-site soils.	Explosion causing building collapse
Medium	Long-term (chronic) risks to human health	Concentrations of a contaminant from site exceeding the generic or site specific assessment criteria
	Long-term (chronic) pollution of sensitive water resource	Leaching of contaminants from a site into a major or minor aquifer
	Significant change in an ecosystem/contamination of off-site soils	Death of a species within a designated nature reserve
Mild	Pollution of non-sensitive water resource	Pollution of a non-classified groundwater
	Significant damage to crops/ buildings/property/infrastructure	Damage to a building rendering it unsafe to occupy (e.g. foundation damage resulting in instability)
	Damage to an ecosystem or sensitive buildings/structures/services	
Minor	Easily preventable non-permanent health effects	Presence of contamination at concentrations which require the use of personal protective equipment during site work
	Harm, although not necessarily significant harm, which may result in financial loss or expenditure to resolve	Loss of plants in a landscaping scheme/discolouration of concrete
	Easily repairable effects of damage to buildings/structures/services	

[1] CIRIA, (2001). *Contaminated Land Risk Assessment. A Guide to Good Practice*. CIRIA C552.
[2] M.J. Carter Associates, (1995*). Prioritisation and Categorisation Procedure for Sites Which May Be Contaminated*. Contaminated Land Report 6. Department of the Environment. C
[3] Environment Agency, (2004). *Model Procedures for the Management of Land Contamination.* Contaminated Land Report 11.

The potential probability of the risks being realised are classified in accordance with the ratings set out in Table 2 which are adapted from the CIRIA guidance[1]. It should be noted that where a pollutant linkage has not been identified the likelihood is considered to be zero.

Table 2. Classifications of probability ratings

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

In accordance with C552 the risk classification for each pollution linkage are classified in accordance with the matrix for consequence and probability set out in Table 3. The definitions for the risk classifications are presented in Table 4.

Table 3. Risk classification matrix

		Consequence			
		Severe	***Medium***	***Mild***	***Minor***
Probability	**High likelihood**	Very High	High	Moderate	Moderate / Low
	Likely	High	Moderate	Moderate / Low	Low
	Low likelihood	Moderate	Moderate / Low	Low	Very Low
	Unlikely	Moderate / Low	Low	Very Low	Very Low

Table 4. Risk classification definitions

Classification	*Definition*
Very High	There is a high probability that severe harm could arise to a designated receptor from the identified hazard or there is evidence that severe harm is currently happening. This risk, if realised, is likely to result in substantial liability. Urgent investigation (if not already undertaken) and remediation are likely to be required.
High	Harm is likely to arise to a designated receptor from the identified hazard. Realisation of the risk is likely to result in substantial liability. Urgent investigation (if not already undertaken) and remediation are likely to be required.
Moderate	It is possible that harm could arise to a designated receptor from the identified hazard. However, it is either relatively unlikely that such harm would be severe or if any harm were to occur it is more likely that the harm would be relatively mild. Urgent investigation (if not already undertaken) is normally required to clarify the potential risk and to determine the potential liability. Some remedial works may be required in the longer term.
Low	It is possible that harm could arise to a designated receptor from the identified hazard, but it is considered likely that this harm, if realised, would at worse normally be mild.
Very Low	There is a low possibility that harm could arise to a designated receptor from the identified hazard. In the event of such harm being realised it is not likely to be severe.

APPENDIX E

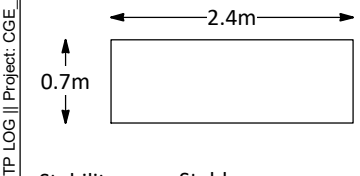
Exploratory Hole Records

TRIAL PIT LOG

Project				TRIAL PIT No
Hoodlands, Harry Stoke				SA01
Job No	Date	Ground Level (m)	Co-Ordinates (m)	
CGE/16484	07-07-20	49.00	E 363,614.0 N 179,463.0	
Client				Sheet
BoKlok Housing UK Ltd				1 of 1

SAMPLES & TESTS			Water	STRATA			
Depth (m)	Type No	Test Result (N/kPa/ppm)		Reduced Level	Legend	Depth (m) (Thick-ness)	DESCRIPTION
				48.90		0.10	Grass over dark brown and brown sandy silt. Frequent roots (up to 15mm diameter) and rootlets. [TOPSOIL]
0.20	ES1			48.60		(0.30) 0.40	Soft to firm dark grey and dark brown slightly sandy slightly gravelly clay. Gravel is angular and subangular fine to coarse brick and ceramic fragments. Rare plastic sheet. Frequent rootlets. [MADE GROUND]
0.50	ES2						
0.80	D1					(1.20)	Soft to firm becoming stiff reddish brown locally mottled light yellowish brown silty CLAY. [MERCIA MUDSTONE GROUP - ZONE IVb]
				47.40		1.60	
1.80	D2					(1.40)	Stiff reddish brown mottled light yellowish brown sandy silty CLAY. [MERCIA MUDSTONE GROUP - ZONE IVa]
				46.00		3.00	
							(Pit terminated at 3m)

Plan



Stability: Stable

General Remarks

METHOD: Trial pit excavated using a JCB 360.
GROUNDWATER: Groundwater was not encountered during the excavation.
CONTAMINATION: Significant visual or olfactory contamiantion was not encountered.
BACKFILL: On completion, trial pit was backfilled with material arisings.

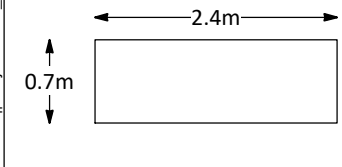
Method/ Plant Used	Field Crew	Logged By	Checked By
JCB 360	Channel Plant Hire	SWO	DRAFT

TRIAL PIT LOG

Project				TRIAL PIT No
Hoodlands, Harry Stoke				TP01
Job No	Date	Ground Level (m)	Co-Ordinates (m)	
CGE/16484	07-07-20	55.00	E 363,554.0 N 179,521.0	
Client				Sheet
BoKlok Housing UK Ltd				1 of 1

SAMPLES & TESTS			Water	STRATA			
Depth (m)	Type No	Test Result (N/kPa/ppm)		Reduced Level	Legend	Depth (m) (Thick-ness)	DESCRIPTION
				54.90		0.10	Grass over dark brown and brown sandy silt. Frequent roots (up to 15mm diameter) and rootlets. [TOPSOIL]
0.30	ES1			54.60		(0.30) 0.40	Firm to stiff dark grey and dark brown locally orangish brown slightly sandy slightly gravelly clay. Gravel is angular and subangular fine and medium brick. Frequent rootlets. [MADE GROUND]
0.70	ES2			54.00		(0.60) 1.00	Firm to stiff reddish brown locally mottled orangish brown slightly sandy silty CLAY. [MERCIA MUDSTONE GROUP - ZONE IVb]
1.20	D1			52.70		(1.30) 2.30	Stiff locally firm reddish brown locally mottled purple and grey slightly sandy CLAY. [MERCIA MUDSTONE GROUP - ZONE IVa]
2.50	B1			52.00		(0.70) 3.00	Stiff to very stiff reddish brown mottled light grey slightly sandy slightly gravelly CLAY. Gravel is subangular and subrounded fine and medium lithorelicts of very stiff clay to extremely weak mudstone. [MERCIA MUDSTONE GROUP - ZONE IVa]
							(Pit terminated at 3m)

Plan



Stability: Stable

General Remarks

METHOD: Trial pit excavated using a JCB 360.
GROUNDWATER: Groundwater was not encountered during the excavation.
CONTAMINATION: Significant visual or olfactory contamiantion was not encountered.
BACKFILL: On completion, trial pit was backfilled with material arisings.

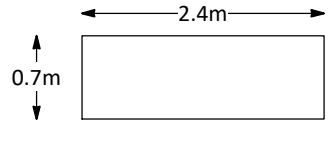
Method/ Plant Used	Field Crew	Logged By	Checked By
JCB 361	Channel Plant Hire	SWO	DRAFT

TRIAL PIT LOG

Project				TRIAL PIT No
Hoodlands, Harry Stoke				TP02
Job No	Date	Ground Level (m)	Co-Ordinates (m)	
CGE/16484	07-07-20	52.00	E 363,596.0 N 179,505.0	
Client				Sheet
BoKlok Housing UK Ltd				1 of 1

SAMPLES & TESTS			Water	STRATA			
Depth (m)	Type No	Test Result (N/kPa/ppm)		Reduced Level	Legend	Depth (m) (Thick-ness)	DESCRIPTION
				51.85		0.15	Grass over dark brown and brown sandy silt. Frequent roots (up to 15mm diameter) and rootlets. [TOPSOIL]
				51.55		(0.30) 0.45	Soft to firm dark grey and dark brown slightly sandy slightly gravelly clay. Gravel is angular and subangular fine to coarse brick. Frequent rootlets. [MADE GROUND]
1.00	D1					(1.15)	Firm to stiff reddish brown locally mottled light yellowish brown silty CLAY. [MERCIA MUDSTONE GROUP - ZONE IVb]
				50.40		1.60	
1.80	B1			50.00		(0.40) 2.00	Firm to stiff reddish brown locally mottled light yellowish brown slightly sandy slightly gravelly CLAY. Gravel is subangular and subrounded fine and medium lithorelicts of very stiff clay to extremely weak mudstone. [MERCIA MUDSTONE GROUP - ZONE IVa]
2.20	D2			49.70		(0.30) 2.30	Stiff reddish brown mottled light grey slightly sandy slightly gravelly CLAY. Gravel is subangular and subrounded fine and medium lithorelicts of very stiff clay to extremely weak mudstone. [MERCIA MUDSTONE GROUP - ZONE IVa]
							(Pit terminated at 2.3m)

Plan



Stability: Stable

General Remarks

METHOD: Trial pit excavated using a JCB 360.
GROUNDWATER: Groundwater was not encountered during the excavation.
CONTAMINATION: Significant visual or olfactory contamiantion was not encountered.
BACKFILL: On completion, trial pit was backfilled with material arisings.
REMARKS: Trial pit terminated at 2.3m due to strength of underling strata.

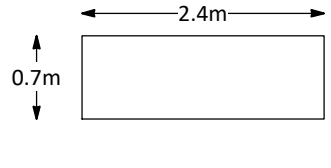
Method/ Plant Used	Field Crew	Logged By	Checked By
JCB 362	Channel Plant Hire	SWO	DRAFT

TRIAL PIT LOG

Project				TRIAL PIT No
Hoodlands, Harry Stoke				TP03
Job No	Date	Ground Level (m)	Co-Ordinates (m)	
CGE/16484	07-07-20	51.00	E 363,583.0 N 179,468.0	
Client				Sheet
BoKlok Housing UK Ltd				1 of 1

SAMPLES & TESTS			Water	STRATA			
Depth (m)	Type No	Test Result (N/kPa/ppm)		Reduced Level	Legend	Depth (m) (Thick-ness)	DESCRIPTION
				50.80		0.20	Grass over dark brown and brown sandy silt. Frequent roots (up to 15mm diameter) and rootlets. [TOPSOIL]
0.40	ES1			50.30		(0.50) 0.70	Soft to firm dark grey and dark brown slightly sandy slightly gravelly clay. Gravel is angular and subangular fine to coarse brick. Frequent rootlets. [MADE GROUND]
0.80	ES2			50.05		(0.25) 0.95	Firm to stiff reddish brown mottled light grey slightly sandy silty CLAY. [MERCIA MUDSTONE GROUP - ZONE IVb]
0.90	D1			49.60		(0.45) 1.40	Stiff to very stiff reddish brown and light grey slightly sandy silty CLAY. [MERCIA MUDSTONE GROUP - ZONE IVa]
1.80	B1			48.30		(1.30) 2.70	Stiff to very stiff reddish brown and light grey slightly sandy slightly gravelly silty CLAY. Gravel is subangular and subrounded fine and medium lithorelicts of very stiff clay to extremely weak mudstone. [MERCIA MUDSTONE GROUP - ZONE IVa]
							(Pit terminated at 2.7m)

Plan



Stability: Stable

General Remarks

METHOD: Trial pit excavated using a JCB 360.
GROUNDWATER: Groundwater was not encountered during the excavation.
CONTAMINATION: Significant visual or olfactory contamiantion was not encountered.
BACKFILL: On completion, trial pit was backfilled with material arisings.
REMARKS: Trial pit terminated at 2.7m due to strength of underling strata.

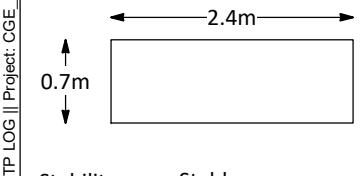
Method/ Plant Used	Field Crew	Logged By	Checked By
JCB 363	Channel Plant Hire	SWO	DRAFT

TRIAL PIT LOG

Project				TRIAL PIT No
Hoodlands, Harry Stoke				**TP04**
Job No	Date	Ground Level (m)	Co-Ordinates (m)	
CGE/16484	07-07-20	54.00	E 363,534.0 N 179,483.0	
Client				Sheet
BoKlok Housing UK Ltd				1 of 1

SAMPLES & TESTS			Water	STRATA			
Depth (m)	Type No	Test Result (N/kPa/ppm)		Reduced Level	Legend	Depth (m) (Thick-ness)	DESCRIPTION
				53.70		(0.30) 0.30	Grass over dark brown and brown sandy silt. Frequent roots (up to 15mm diameter) and rootlets. [TOPSOIL]
0.50	D1			52.60		(1.10) 1.40	Soft to firm becoming stiff reddish brown mottled light grey sandy silty CLAY. [MERCIA MUDSTONE GROUP - ZONE IVb]
1.50	D2			51.00		(1.60) 3.00	Stiff to very stiff reddish brown locally mottled light grey slightly sandy silty CLAY. [MERCIA MUDSTONE GROUP - ZONE IVa] 1.40 Locally light grey.
							(Pit terminated at 3m)

Plan



Stability: Stable

General Remarks

METHOD: Trial pit excavated using a JCB 360.
GROUNDWATER: Groundwater was not encountered during the excavation.
CONTAMINATION: Significant visual or olfactory contamiantion was not encountered.
BACKFILL: On completion, trial pit was backfilled with material arisings.

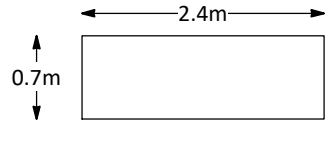
Method/ Plant Used	Field Crew	Logged By	Checked By
JCB 364	Channel Plant Hire	SWO	DRAFT

TRIAL PIT LOG

Project				TRIAL PIT No
Hoodlands, Harry Stoke				TP05
Job No	Date	Ground Level (m)	Co-Ordinates (m)	
CGE/16484	07-07-20	54.00	E 363,505.0 N 179,447.0	
Client				Sheet
BoKlok Housing UK Ltd				1 of 1

SAMPLES & TESTS			Water	STRATA			
Depth (m)	Type No	Test Result (N/kPa/ppm)		Reduced Level	Legend	Depth (m) (Thick-ness)	DESCRIPTION
0.05	ES1			53.90		0.10	Grass over dark brown and brown sandy silt. Frequent roots (up to 15mm diameter) and rootlets. [TOPSOIL]
				53.65		(0.25) 0.35	Firm dark grey and dark brown slightly sandy slightly gravelly clay. Gravel is angular and subangular fine to coarse brick and ceramic fragments. Frequent rootlets. [MADE GROUND]
1.00	D1					(1.35)	Firm to stiff reddish brown mottled light yellowish brown and light grey slightly sandy CLAY. [MERCIA MUDSTONE GROUP - ZONE IVb]
				52.30		1.70	
1.90	B1					(0.80)	Reddish brown and light grey slightly clayey sandy subangular and subrounded fine to coarse mudstone GRAVEL. [MERCIA MUDSTONE GROUP - ZONE IVa]
				51.50		2.50	*(Pit terminated at 2.5m)*

Plan



Stability: Stable

General Remarks

METHOD: Trial pit excavated using a JCB 360.
GROUNDWATER: Groundwater was not encountered during the excavation.
CONTAMINATION: Significant visual or olfactory contamiantion was not encountered.
BACKFILL: On completion, trial pit was backfilled with material arisings.
REMARKS: Trial pit terminated at 2.5m due to strength of underling strata. A 25mm LV cable was identified in the sidewall of the trial pit, approximately 300mm deep.

Method/ Plant Used	Field Crew	Logged By	Checked By
JCB 365	Channel Plant Hire	SWO	DRAFT

WINDOW SAMPLE LOG

Project				HOLE No
Hoodlands, Harry Stoke				**WS01**
Job No	Date	Ground Level (m)	Co-Ordinates (m)	
CGE/16484	08-07-20	48.00	E 363,608.0 N 179,411.0	
Client				Sheet
BoKlok Housing UK Ltd				1 of 1

SAMPLES & TESTS			Water	STRATA				Instrument /Backfill
Depth (m)	Type No	Test Result (N/kPa/ppm)		Reduced Level	Legend	Depth (m) (Thick-ness)	DESCRIPTION	
0.10	ES1			47.80		0.20	Dark grey slightly gravelly silty fine to coarse sand. Gravel is angular and subangular fine and medium concrete, brick and ceramic fragments. [MADE GROUND]	
0.30	ES2			47.60		0.40	Firm dark grey and black slightly sandy slightly gravelly clay. Gravel is angular and subangular fine and medium concrete, brick and ceramic fragments. [MAGE GROUND]	
0.70	ES3			47.40		0.60	Light grey and grey sandy angular to subrounded fine to coarse concrete gravel. [MADE GROUND]	
1.00	SPT	N4				(0.90)	Firm dark grey and dark brown locally black slightly sandy slightly gravelly clay. Gravel is angular and subangular fine and medium concrete, brick and ceramic fragments. Rare decomposed roots, plastics and glass fragments. [MADE GROUND]	
				46.50		1.50		
1.60	ES4						Firm becoming stiff reddish brown silty CLAY. [MERCIA MUDSTONE GROUP - ZONE IVb]	
1.80	D1						1.80 Reddish brown and light yellowish brown.	
2.00	SPT	N37				(1.30)		
				45.20		2.80		
2.80	SPT	N54					*(Window sample terminated at 2.8m)*	

Boring Progress and Water Observations

Date	Strike depth	Casing depth	Comment	Time measured	Standing Depth

General Remarks

METHOD: Dynamic sample (87mm diameter) 0.0m to 1.0m, (77mm diameter) 1.0m to 2.0m and (67mm) 2.8m to 2.8m)
GROUNDWATER: Groundwater was not encountered during the excavation.
CONTAMINATION: Significant visual or olfactory contamiantion was not encountered.
BACKFILL: On completion, borehole was backfilled 2.8m to 1.5m. A slotted standpipe (50mm) was installed from 1.5m to 0.5m, bentonite seal 0.5m to 0.2m, stopcock and cover 0.2m to 0.0m.

Method/ Plant Used	Field Crew	Logged By	Checked By
Dando Terrier 2002	Wesses Drilling Ltd	SWO	DRAFT

WINDOW SAMPLE LOG

Project				HOLE No
Hoodlands, Harry Stoke				WS02
Job No	Date	Ground Level (m)	Co-Ordinates (m)	
CGE/16484	08-07-20	51.00	E 363,567.0 N 179,426.0	
Client				Sheet
BoKlok Housing UK Ltd				1 of 1

SAMPLES & TESTS			Water	STRATA				
Depth (m)	Type No	Test Result (N/kPa/ppm)		Reduced Level	Legend	Depth (m) (Thick-ness)	DESCRIPTION	Instrument /Backfill
				50.90		0.10	Dark grey slightly gravelly silty fine to coarse sand. Gravel is angular and subangular fine and medium concrete and brick. [MADE GROUND]	
0.20	ES1					(0.30)		
				50.60		0.40	Firm dark grey and dark brown slightly clayey gravelly fine to coarse sand. Gravel is angular and subangular fine and medium concrete and sandstone. [MADE GROUND]	
0.50	ES2					(0.60)	Firm to stiff reddish brown mottled light bluish grey slightly sandy silty CLAY. [MERCIA MUDSTONE GROUP - ZONE IVb]	
				50.00		1.00		
1.00	SPT	N56					*(Window sample terminated at 1m)*	

Boring Progress and Water Observations

Date	Strike depth	Casing depth	Comment	Time measured	Standing Depth

General Remarks

METHOD: Dynamic sample (87mm diameter) 0.0m to 1.0m.
GROUNDWATER: Groundwater was not encountered during the excavation.
CONTAMINATION: Significant visual or olfactory contamiantion was not encountered.
BACKFILL: On completion, borehole was backfilled with material arisings.

Method/ Plant Used	Field Crew	Logged By	Checked By
Dando Terrier 2002	Wesses Drilling Ltd	SWO	DRAFT

WINDOW SAMPLE LOG

Project				HOLE No
Hoodlands, Harry Stoke				**WS03**
Job No	Date	Ground Level (m)	Co-Ordinates (m)	
CGE/16484	08-07-20	50.00	E 363,617.0 N 179,486.0	
Client				Sheet
BoKlok Housing UK Ltd				1 of 1

SAMPLES & TESTS			Water	STRATA				Instrument /Backfill
Depth (m)	Type No	Test Result (N/kPa/ppm)		Reduced Level	Legend	Depth (m) (Thick-ness)	DESCRIPTION	
0.30	D1			49.35		(0.65) 0.65	Grass over soft to firm reddish and orangish brown silty CLAY. [MERCIA MUDSTONE GROUP - ZONE IVb] 0.00 - 0.30 Frequent rootlets.	
1.00	SPT	N44		48.70		(0.65) 1.30	Stiff reddish brown mottled light yellowish brown slightly sandy silty CLAY. [MERCIA MUDSTONE GROUP - ZONE IVa]	
1.70	SPT	N60		48.30		(0.40) 1.70	Stiff to very stiff light yellowish grey mottled light grey and light orangish brown silty CLAY. [MERCIA MUDSTONE GROUP - ZONE IVa]	
							(Window sample terminated at 1.7m)	

Boring Progress and Water Observations

Date	Strike depth	Casing depth	Comment	Time measured	Standing Depth

General Remarks

METHOD: Dynamic sample (87mm diameter) 0.0m to 1.0m, (77mm diameter) 1.0m to 1.7m.
GROUNDWATER: Groundwater was not encountered during the excavation.
CONTAMINATION: Significant visual or olfactory contamiantion was not encountered.
BACKFILL: On completion, borehole was backfilled with material arisings.

Method/ Plant Used	Field Crew	Logged By	Checked By
Dando Terrier 2002	Wesses Drilling Ltd	SWO	DRAFT

WINDOW SAMPLE LOG

Project				HOLE No
Hoodlands, Harry Stoke				**WS04**
Job No	Date	Ground Level (m)	Co-Ordinates (m)	
CGE/16484	08-07-20	50.00	E 363,593.0 N 179,434.0	
Client				Sheet
BoKlok Housing UK Ltd				1 of 1

SAMPLES & TESTS			Water	STRATA				
Depth (m)	Type No	Test Result (N/kPa/ppm)		Reduced Level	Legend	Depth (m) (Thick-ness)	DESCRIPTION	Instrument /Backfill
				49.90		0.10	Grass over dark brown and brown sandy silt. Frequent rootlets. [TOPSOIL]	
				49.30		(0.60) 0.70	Soft to firm dark grey and dark brown slightly sandy slightly gravelly clay. Gravel is angular and subangular fine to coarse brick. Frequent rootlets. [MADE GROUND]	
1.00	SPT	N27		48.90		(0.40) 1.10	Firm to stiff reddish brown locally mottled light grey silty CLAY. [MERCIA MUDSTONE GROUP - ZONE IVb]	
				48.60		(0.30) 1.40	Stiff to very stiff light yellowish grey mottled light grey and light orangish brown silty CLAY. [MERCIA MUDSTONE GROUP - ZONE IVa]	
				48.00		(0.60) 2.00	Stiff to very stiff reddish brown mottled light yellowish brown and light grey silty CLAY. [MERCIA MUDSTONE GROUP - ZONE IVa]	
2.00	SPT	N55					*(Window sample terminated at 2m)*	

Boring Progress and Water Observations

Date	Strike depth	Casing depth	Comment	Time measured	Standing Depth

General Remarks

METHOD: Dynamic sample (87mm diameter) 0.0m to 1.0m, (77mm diameter) 1.0m to 2.0m.
GROUNDWATER: Groundwater was not encountered during the excavation.
CONTAMINATION: Significant visual or olfactory contamiantion was not encountered.
BACKFILL: On completion, a slotted standpipe (50mm) was installed from 2.0m to 1.0m, bentonite seal 1.0m to 0.2m, stopcock and cover 0.2m to 0.0m.

Method/ Plant Used	Field Crew	Logged By	Checked By
Dando Terrier 2002	Wesses Drilling Ltd	SWO	DRAFT

WINDOW SAMPLE LOG

Project				HOLE No
Hoodlands, Harry Stoke				WS05
Job No	Date	Ground Level (m)	Co-Ordinates (m)	
CGE/16484	08-07-20	53.00	E 363,550.0 N 179,459.0	
Client				Sheet
BoKlok Housing UK Ltd				1 of 1

SAMPLES & TESTS			Water	STRATA				Instrument /Backfill
Depth (m)	Type No	Test Result (N/kPa/ppm)		Reduced Level	Legend	Depth (m) (Thick-ness)	DESCRIPTION	
				52.90		0.10	Grass over dark brown and brown sandy silt. Frequent rootlets. [TOPSOIL]	
				52.65		(0.25) 0.35	Soft to firm dark grey and dark brown slightly sandy slightly gravelly clay. Gravel is angular and subangular fine to coarse brick. Frequent rootlets. [MADE GROUND]	
						(0.65)	Stiff to very stiff reddish brown and light grey slightly sandy slightly gravelly silty CLAY. Gravel is subangular and subrounded fine and medium lithorelicts of very stiff clay to extremely weak mudstone. [MERCIA MUDSTONE GROUP - ZONE IVa]	
1.00	SPT	N70		52.00		1.00	*(Window sample terminated at 1m)*	

Boring Progress and Water Observations

Date	Strike depth	Casing depth	Comment	Time measured	Standing Depth

General Remarks

METHOD: Dynamic sample (87mm diameter) 0.0m to 1.0m.
GROUNDWATER: Groundwater was not encountered during the excavation.
CONTAMINATION: Significant visual or olfactory contamiantion was not encountered.
BACKFILL: On completion, borehole was backfilled with material arisings.

Method/ Plant Used	Field Crew	Logged By	Checked By
Dando Terrier 2002	Wesses Drilling Ltd	SWO	DRAFT

WINDOW SAMPLE LOG

Project				HOLE No
Hoodlands, Harry Stoke				**WS06**
Job No	Date	Ground Level (m)	Co-Ordinates (m)	
CGE/16484	08-07-20	49.00	E 363,595.0 N 179,429.0	
Client				Sheet
BoKlok Housing UK Ltd				1 of 1

SAMPLES & TESTS			Water	STRATA				
Depth (m)	Type No	Test Result (N/kPa/ppm)		Reduced Level	Legend	Depth (m) (Thick-ness)	DESCRIPTION	Instrument /Backfill
0.05	ES1			48.80		0.20	Dark grey slightly gravelly silty fine to coarse sand. Gravel is angular and subangular fine and medium concrete, brick and ceramic fragments. [MADE GROUND]	
				48.50		(0.30) 0.50	Firm dark grey and black slightly sandy slightly gravelly clay. Gravel is angular and subangular fine and medium concrete, brick and ceramic fragments. [MADE GROUND]	
0.60	ES2			48.20		(0.30) 0.80	Firm dark grey and dark brown locally black slightly sandy slightly gravelly clay. Gravel is angular and subangular fine and medium concrete, brick and ceramic fragments. Rare decomposed roots, plastics and glass fragments. [MADE GROUND]	
1.00	SPT	N19					Firm becoming stiff reddish brown locally mottled yellowish brown silty CLAY. [MERCIA MUDSTONE GROUP - ZONE IVb]	
				47.00		(1.20) 2.00		
2.00	SPT	N50					*(Window sample terminated at 2m)*	

Boring Progress and Water Observations

Date	Strike depth	Casing depth	Comment	Time measured	Standing Depth

General Remarks

METHOD: Dynamic sample (87mm diameter) 0.0m to 1.0m, (77mm diameter) 1.0m to 2.0m.
GROUNDWATER: Groundwater was not encountered during the excavation.
CONTAMINATION: Significant visual or olfactory contamiantion was not encountered.
BACKFILL: On completion, a slotted standpipe (50mm) was installed from 2.0m to 1.0m, bentonite seal 1.0m to 0.2m, stopcock and cover 0.2m to 0.0m.

Method/ Plant Used	Field Crew	Logged By	Checked By
Dando Terrier 2002	Wesses Drilling Ltd	SWO	DRAFT

APPENDIX F

Chemical Laboratory Results

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Analytical Report Number : 20-18547

Project / Site name:	Hoodlands, Harry Stoke	**Samples received on:**	10/07/2020
Your job number:	CGE-16484	**Sample instructed/ Analysis started on:**	10/07/2020
Your order number:	POP005038	**Analysis completed by:**	20/07/2020
Report Issue Number:	1	**Report issued on:**	20/07/2020
Samples Analysed:	12 soil samples		

Signed:

Joanna Wawrzeczko
Technical Reviewer (Reporting Team)

For & on behalf of i2 Analytical Ltd.

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

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

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

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

Excel copies of reports are only valid when accompanied by this PDF certificate.

Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement. Application of uncertainty of measurement would provide a range within which the true result lies. An estimate of measurement uncertainty can be provided on request.

Analytical Report Number: 20-18547

Project / Site name: Hoodlands, Harry Stoke
Your Order No: POP005038

Lab Sample Number				1557487	1557488	1557489	1557490	1557491
Sample Reference				SA1	TP01	TP01	TP03	TP03
Sample Number				1	1	2	1	2
Depth (m)				0.20	0.30	0.70	0.40	0.80
Date Sampled				07/07/2020	07/07/2020	07/07/2020	07/07/2020	07/07/2020
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	16	18	15	16	12
Total mass of sample received	kg	0.001	NONE	1.7	1.6	1.9	1.5	1.5
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	-	-	-	-
Asbestos in Soil	Type	N/A	ISO 17025	-	Not-detected	-	Not-detected	-
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	8.6	7.5	7.9	7.5	7.9
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	-
Total Sulphate as SO_4	mg/kg	50	MCERTS	1300	770	330	880	-
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	-	-	0.0079	-	0.0058
Organic Matter	%	0.1	MCERTS	5.2	6.2	0.8	5.0	-
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	-
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	-
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	-
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	-
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	-
Phenanthrene	mg/kg	0.05	MCERTS	1.3	0.31	< 0.05	0.60	-
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	-
Fluoranthene	mg/kg	0.05	MCERTS	2.2	0.52	< 0.05	1.3	-
Pyrene	mg/kg	0.05	MCERTS	1.8	0.45	< 0.05	1.1	-
Benzo(a)anthracene	mg/kg	0.05	MCERTS	1.2	0.32	< 0.05	0.82	-
Chrysene	mg/kg	0.05	MCERTS	1.3	0.41	< 0.05	0.92	-
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	1.6	0.38	< 0.05	1.0	-
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.58	0.19	< 0.05	0.46	-
Benzo(a)pyrene	mg/kg	0.05	MCERTS	1.2	0.33	< 0.05	0.81	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.57	< 0.05	< 0.05	0.42	-
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.61	< 0.05	< 0.05	0.36	-
Coronene	mg/kg	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	-
Total PAH								
Total WAC-17 PAHs	mg/kg	0.85	NONE	12.2	2.91	< 0.85	7.83	-
Heavy Metals / Metalloids								
Antimony (aqua regia extractable)	mg/kg	1	ISO 17025	4.5	3.8	2.6	4.0	-
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	39	20	23	18	-
Barium (aqua regia extractable)	mg/kg	1	MCERTS	360	250	78	280	-
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	1.3	1.1	1.5	1.4	-
Boron (water soluble)	mg/kg	0.2	MCERTS	1.7	2.4	0.8	2.3	-
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	1.0	1.5	< 0.2	0.9	-
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2	< 1.2	< 1.2	< 1.2	-
Chromium (III)	mg/kg	1	NONE	24	25	35	29	-
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	24	25	35	29	-
Copper (aqua regia extractable)	mg/kg	1	MCERTS	80	54	28	71	-
Lead (aqua regia extractable)	mg/kg	1	MCERTS	220	170	20	170	-
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	0.7	0.7	< 0.3	0.8	-
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	27	30	33	34	-
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	-
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	29	30	37	34	-
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	320	310	210	310	-

Analytical Report Number: 20-18547

Project / Site name: Hoodlands, Harry Stoke
Your Order No: POP005038

Lab Sample Number				1557487	1557488	1557489	1557490	1557491
Sample Reference				SA1	TP01	TP01	TP03	TP03
Sample Number				1	1	2	1	2
Depth (m)				0.20	0.30	0.70	0.40	0.80
Date Sampled				07/07/2020	07/07/2020	07/07/2020	07/07/2020	07/07/2020
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics & Oxygenates								
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	-
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	-
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	-
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	-
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	-
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	-
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	-
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	-
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	-
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	-
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	-
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	-
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	-
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	-
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	-
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	-
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	-
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	-
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	12	< 10	< 10	10	-
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	19	13	< 10	24	-
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	31	21	< 10	34	-

Analytical Report Number: 20-18547

Project / Site name: Hoodlands, Harry Stoke
Your Order No: POP005038

Lab Sample Number				1557492	1557493	1557494	1557495	1557496
Sample Reference				TP05	WS01	WS01	WS01	WS01
Sample Number				1	1	2	3	4
Depth (m)				0.10	0.10	0.30	0.70	1.60
Date Sampled				07/07/2020	07/07/2020	08/07/2020	08/07/2020	08/07/2020
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	17	15	7.6	19	14
Total mass of sample received	kg	0.001	NONE	1.2	1.2	0.46	1.6	0.50
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	-	Chrysotile- Loose Fibres	-	-
Asbestos in Soil	Type	N/A	ISO 17025	-	Not-detected	Detected	Not-detected	-
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	7.5	7.9	7.9	9.0	8.0
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Total Sulphate as SO_4	mg/kg	50	MCERTS	950	470	2100	2300	380
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	-	-	-	0.27	0.062
Organic Matter	%	0.1	MCERTS	6.5	0.3	8.4	3.5	< 0.1
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	0.89	< 0.05	0.94	2.2	< 0.05
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.22	0.48	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	1.6	< 0.05	0.90	3.3	< 0.05
Pyrene	mg/kg	0.05	MCERTS	1.5	< 0.05	0.83	2.6	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.90	< 0.05	0.60	1.8	< 0.05
Chrysene	mg/kg	0.05	MCERTS	1.1	< 0.05	0.70	1.7	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	1.3	< 0.05	0.66	1.9	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.61	< 0.05	0.32	0.84	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	1.0	< 0.05	0.55	1.3	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.45	< 0.05	0.24	0.63	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.48	< 0.05	0.26	0.60	< 0.05
Coronene	mg/kg	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Total PAH								
Total WAC-17 PAHs	mg/kg	0.85	NONE	9.79	< 0.85	6.22	17.5	< 0.85
Heavy Metals / Metalloids								
Antimony (aqua regia extractable)	mg/kg	1	ISO 17025	3.2	1.5	2.4	12	1.4
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	12	19	26	17	15
Barium (aqua regia extractable)	mg/kg	1	MCERTS	320	160	240	360	110
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	1.0	1.0	0.94	1.1	0.82
Boron (water soluble)	mg/kg	0.2	MCERTS	1.7	0.7	1.0	1.2	< 0.2
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.9	< 0.2	0.4	0.8	< 0.2
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
Chromium (III)	mg/kg	1	NONE	25	32	8.1	23	28
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	25	32	8.6	23	28
Copper (aqua regia extractable)	mg/kg	1	MCERTS	51	33	79	45	28
Lead (aqua regia extractable)	mg/kg	1	MCERTS	150	22	110	140	12
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	0.6	< 0.3	0.4	0.4	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	24	34	46	24	27
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	3.5	2.3	1.9	3.4
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	26	32	12	30	27
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	360	160	200	290	100

Analytical Report Number: 20-18547

Project / Site name: Hoodlands, Harry Stoke
Your Order No: POP005038

Lab Sample Number				1557492	1557493	1557494	1557495	1557496
Sample Reference				TP05	WS01	WS01	WS01	WS01
Sample Number				1	1	2	3	4
Depth (m)				0.10	0.10	0.30	0.70	1.60
Date Sampled				07/07/2020	07/07/2020	08/07/2020	08/07/2020	08/07/2020
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics & Oxygenates								
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10

TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	2.3	< 2.0	5.5	2.4	< 2.0
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	16	< 10	18	21	< 10
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	33	< 10	23	38	< 10
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	51	< 10	46	61	< 10

Analytical Report Number: 20-18547

Project / Site name: Hoodlands, Harry Stoke
Your Order No: POP005038

Lab Sample Number				1557497	1557498			
Sample Reference				WS06	WS06			
Sample Number				1	2			
Depth (m)				0.05	0.60			
Date Sampled				08/07/2020	08/07/2020			
Time Taken				None Supplied	None Supplied			
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1			
Moisture Content	%	N/A	NONE	5.2	19			
Total mass of sample received	kg	0.001	NONE	0.50	0.40			
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	-			
Asbestos in Soil	Type	N/A	ISO 17025	-	-			
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	8.3	7.6			
Total Cyanide	mg/kg	1	MCERTS	< 1	-			
Total Sulphate as SO_4	mg/kg	50	MCERTS	1000	-			
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	-	0.064			
Organic Matter	%	0.1	MCERTS	2.7	-			
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	-			
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	-			
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	-			
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	-			
Fluorene	mg/kg	0.05	MCERTS	< 0.05	-			
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	-			
Anthracene	mg/kg	0.05	MCERTS	< 0.05	-			
Fluoranthene	mg/kg	0.05	MCERTS	0.65	-			
Pyrene	mg/kg	0.05	MCERTS	0.68	-			
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.48	-			
Chrysene	mg/kg	0.05	MCERTS	0.49	-			
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	1.0	-			
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.39	-			
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.69	-			
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.59	-			
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	-			
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.72	-			
Coronene	mg/kg	0.05	NONE	< 0.05	-			
Total PAH								
Total WAC-17 PAHs	mg/kg	0.85	NONE	5.69	-			
Heavy Metals / Metalloids								
Antimony (aqua regia extractable)	mg/kg	1	ISO 17025	6.8	-			
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	17	-			
Barium (aqua regia extractable)	mg/kg	1	MCERTS	320	-			
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	1.4	-			
Boron (water soluble)	mg/kg	0.2	MCERTS	0.8	-			
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.8	-			
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2	-			
Chromium (III)	mg/kg	1	NONE	44	-			
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	44	-			
Copper (aqua regia extractable)	mg/kg	1	MCERTS	270	-			
Lead (aqua regia extractable)	mg/kg	1	MCERTS	260	-			
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	-			
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	28	-			
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	-			
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	22	-			
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	1800	-			

Analytical Report Number: 20-18547

Project / Site name: Hoodlands, Harry Stoke
Your Order No: POP005038

Lab Sample Number				1557497	1557498			
Sample Reference				WS06	WS06			
Sample Number				1	2			
Depth (m)				0.05	0.60			
Date Sampled				08/07/2020	08/07/2020			
Time Taken				None Supplied	None Supplied			
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics & Oxygenates								
Benzene	µg/kg	1	MCERTS	< 1.0	-			
Toluene	µg/kg	1	MCERTS	< 1.0	-			
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	-			
p & m-xylene	µg/kg	1	MCERTS	< 1.0	-			
o-xylene	µg/kg	1	MCERTS	< 1.0	-			
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	-			

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	-			
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	-			
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	-			
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	8.0	-			
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	240	-			
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	450	-			
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	280	-			
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	970	-			

TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	-			
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	-			
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	-			
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	3.2	-			
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	110	-			
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	240	-			
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	180	-			
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	530	-			

Analytical Report Number : 20-18547

Project / Site name: Hoodlands, Harry Stoke

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
1557487	SA1	1	0.20	Brown loam and clay with gravel and vegetation.
1557488	TP01	1	0.30	Brown loam and clay with gravel and vegetation.
1557489	TP01	2	0.70	Brown loam and clay with gravel and vegetation.
1557490	TP03	1	0.40	Brown loam and clay with gravel and vegetation.
1557491	TP03	2	0.80	Brown loam and clay with gravel and vegetation.
1557492	TP05	1	0.10	Brown loam and clay with gravel and vegetation.
1557493	WS01	1	0.10	Brown clay with gravel.
1557494	WS01	2	0.30	Grey loam and clay with gravel and brick.
1557495	WS01	3	0.70	Grey loam and clay with gravel and brick.
1557496	WS01	4	1.60	Brown sandy clay.
1557497	WS06	1	0.05	Brown loam and clay with gravel.
1557498	WS06	2	0.60	Brown loam and clay with gravel.

Analytical Report Number : 20-18547

Project / Site name: Hoodlands, Harry Stoke

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Cr (III) in soil	In-house method by calculation from total Cr and Cr VI.	In-house method by calculation	L080-PL	W	NONE
Hexavalent chromium in soil (Lower Level)	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
Organic matter (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L009-PL	D	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
Speciated WAC-17 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270. MCERTS accredited except Coronene.	L064-PL	D	NONE
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Total sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L088/76-PL	W	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

APPENDIX G

Geotechnical Laboratory Results

APPENDIX H

Infiltration Test Results

Test Location: SA01 **Test No: 1** **Date: 07/07/2020**

Water Level during Test

Time (mins)	Depth (m bgl)
0	1.10
0.25	1.10
0.5	1.10
0.75	1.10
1	1.11
2	1.11
3	1.11
4	1.11
5	1.11
10	1.11
15	1.11
20	1.11
25	1.11
30	1.11
35	1.11
40	1.11
60	1.11
90	1.11
120	1.11
180	1.11
Test Complete	

Trial Pit Dimensions

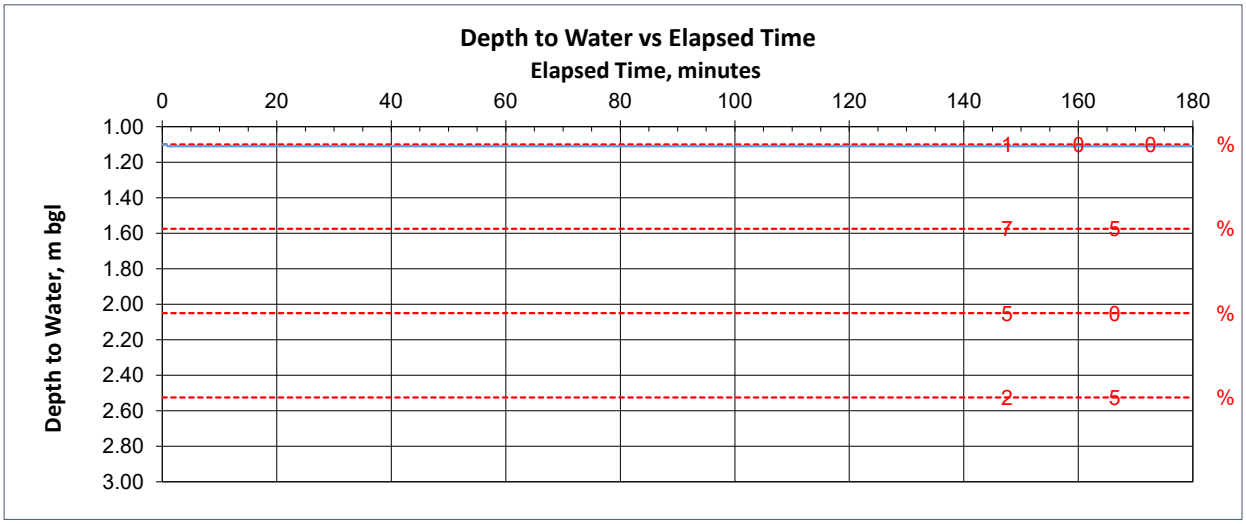
Depth	3 m bgl
Length	2.4 m
Width	0.7 m

$$f = \frac{V_p}{\alpha_p \times t_p}$$

f = soil infiltration rate
Vp = volume of water from 75% to 25% effective depth
ap = Internal surface area at 50% effective depth
tp = time for the water level to fall from 75% to 25% effective depth

time at 75% effective depth (mins)	-
time at 25% effective depth (mins)	-
(from graph)	

Calculated Soil Infiltration Rate = **- m/sec**



Notes: BRE Digest 365. (2003). Soakaway design.

Client	Project	Job No.
BoKlok Housing UK Limited	**Hoodlands, Harry Stoke**	**CGE/16484**
CGL	Title: **Soil Infiltration Test**	Created SWO 09/07/2020 Checked GML 15/07/2020 Approved

APPENDIX I

Monitoring Records

Material: Intensive Lightweight Topsoil

Source: Bourne Amenity Ltd

Date Tested: 11/02/2019

Tested Against: BS3882:2015 Multipurpose Grade

Tested By: Tim O'Hare Associates (TOHA/19/7901/SS)

Parameter	Unit	BS3882:2015 Multipurpose Range	Result	Compliance
Texture:				
Clay (<0.002mm)	% w/w	5 - 30%	13	*Yes*
Silt (0.002 - 0.63mm)	% w/w	0 - 65%	11	*Yes*
Sand (0.05 - 2.0mm)	% w/w	20 - 90%	76	*Yes*
Textual Class:		**Sandy Loam**		
Stones (2 - 20mm)	% w/w DW	0 - 30%	3	*Yes*
Stones (20-50mm)	% w/w DW	0 - 10%	0	*Yes*
Stones (>50mm)	% w/w DW	0%	0	*Yes*
Sand Fraction (USGA Sieve Sizes):				
Very Fine Sand (0.05 - 0.15mm)	% w/w	n/a	22	--
Fine Sand (0.15 - 0.25mm)	% w/w	n/a	20	--
Medium Sand (0.25 - 0.50mm)	% w/w	n/a	24	--
Coarse Sand (0.50 - 1.0mm)	% w/w	n/a	7	--
Very Coarse Sand (1.0 - 2.0mm)	% w/w	n/a	3	--
Organic Matter (LOI)	% w/w	3.0 - 20.0	8.0	*Yes*
Ph		5.5 - 8.5	8.5	*Yes*
Exchangeable Sodium Percentage	%	< 15%	9.0	*Yes*
Phytotoxic Contaminants:				
Total Zinc	mg/kg	< 300	50	*Yes*
Total Copper	mg/kg	< 200	22	*Yes*
Total Nickel	mg/kg	< 180	10	*Yes*
Available Nutrients:				
Nitrogen	mg/l	>0.15	0.35	*Yes*
Phosphorus	mg/l	16 - 140	56	*Yes*
Potassium	mg/l	121 - 1500	1339	*Yes*
Magnesium	mg/l	51 - 600	118	*Yes*
Carbon:Nitrogen Ratio	:1	< 20:1	13	*Yes*
Additional Analysis:				
Electrical Conductivity (1:2.5 water extract)	µS/cm	1500	1519	*No*
Electrical Conductivity (1:2 $CaSO_4$ extract)	µS/cm	3300	2755	*Yes*
Calculated Bulk Density 'as received'	kg/m³	n/a	840	--
Bulk Density at Field Capacity	kg/m³	n/a	1450	--
Moisture Content 'as received'	%	n/a	19	--
Moisture Content at Field Capacity	%	n/a	53	--
Calculated Bulk Density at Saturation	kg/m³	n/a	1550	--
Total Porosity	%	n/a	52.8	--
Saturated Hydraulic Conductivity	mm/hr	n/a	54.6	--
Visible Contaminants:				
Plastics (>2.0mm)	% w/w	< 0.5	0.0	*Yes*
Sharps (>2.0mm)	% w/w	< 0.25	0.0	*Yes*

Bourne Amenity, The Wharf, Rye Road, Newenden, Kent TN18 5QG
01797 252299 • enquiries@bourneamenity.co.uk
www.bourneamenity.co.uk
VAT No: 863 1196 22 • Registered in England No: 3453821

Parameter	Unit	Guidelines	Value	Result	Compliance
Heavy Metals and Hydrocarbons					
Total Antimony (Sb)	mg/kg	S4UL	<500	<1.0	*Yes*
Total Arsenic (As)	mg/kg	S4UL	<37	9	*Yes*
Total Barium (Ba)	mg/kg	S4UL	<1300	39	*Yes*
Total Beryllium (Be)	mg/kg	S4UL	<1.7	0.36	*Yes*
Total Cadmium (Cd)	mg/kg	S4UL	<11	<0.2	*Yes*
Total Chromium III (Cr)	mg/kg	S4UL	<910	13	*Yes*
Total Cyanide (Cn)	mg/kg	Dutch Action Value (DAV)	<20	<1	*Yes*
Total Lead (Pb)	mg/kg	SP1010 (Defra Category 4)	<200	24	*Yes*
Total Mercury (Hg)	mg/kg	S4UL	<1.2	0.8	*Yes*
Total (mono) Phenols	mg/kg	S4UL^	<550	<1.0	*Yes*
Total Selenium (Se)	mg/kg	S4UL	<250	<1.0	*Yes*
Total Vanadium (V)	mg/kg	S4UL	<410	20	*Yes*
Water Soluble Boron (B)	mg/kg	S4UL	<290	4.9	*Yes*
Water Soluble Sulphate (SO4)	g/l	BRE Special Digest 1:2005 (BRE)	<1.2	0.27	*Yes*
Acenaphthylene	mg/kg	S4UL^	<420	<0.05	*Yes*
Acenaphthene	mg/kg	S4UL^	<510	<0.05	*Yes*
Anthracene	mg/kg	S4UL^	<5400	<0.05	*Yes*
Benzo (a) Anthracene	mg/kg	S4UL^	<11	<0.05	*Yes*
Benzo (a) Pyrene	mg/kg	S4UL^	<2.7	<0.05	*Yes*
Benzo (b) Fluoranthene	mg/kg	S4UL^	<3.3	<0.05	*Yes*
Benzo (g,h,i) Perylene	mg/kg	S4UL^	<340	<0.05	*Yes*
Benzo (k) Fluoranthene	mg/kg	S4UL^	<93	<0.05	*Yes*
Chrysene	mg/kg	S4UL^	<22	<0.05	*Yes*
Dibenzo (a,h) Anthracene	mg/kg	S4UL^	<0.28	<0.05	*Yes*
Fluoranthene	mg/kg	S4UL^	<560	<0.05	*Yes*
Fluorene	mg/kg	S4UL^	<400	<0.05	*Yes*
Indeno (1,2,3-cd) Pyrene	mg/kg	S4UL^	<36	<0.05	*Yes*
Naphthalene	mg/kg	S4UL^	<5.6	<0.05	*Yes*
Phenanthrene	mg/kg	S4UL^	<220	<0.05	*Yes*
Pyrene	mg/kg	S4UL^	<1200	<0.05	*Yes*
Aliphatic TPH (C5 - C6)	mg/kg	S4UL^	<78	<0.01	*Yes*
Aliphatic TPH (C6 - C8)	mg/kg	S4UL^	<230	<0.01	*Yes*
Aliphatic TPH (C8 - C10)	mg/kg	S4UL^	<65	<0.01	*Yes*
Aliphatic TPH (C10 - C12)	mg/kg	S4UL^	<330	<1.0	*Yes*
Aliphatic TPH (C12 - C16)	mg/kg	S4UL^	<2400	<2.0	*Yes*
Aliphatic TPH (C16 - C21)	mg/kg	S4UL^	<92000	<8.0	*Yes*
Aliphatic TPH (C21 - C35)	mg/kg	S4UL^		<8.0	*Yes*
Aliphatic TPH (C35 - C44)	mg/kg	S4UL^	<92000	<8.4	*Yes*
Aromatic TPH (C5 - C7)	mg/kg	S4UL^	<140	<0.01	*Yes*
Aromatic TPH (C7 - C8)	mg/kg	S4UL^	<290	<0.01	*Yes*
Aromatic TPH (C8 - C10)	mg/kg	S4UL^	<83	<0.01	*Yes*
Aromatic TPH (C10 - C12)	mg/kg	S4UL^	<180	<1.0	*Yes*
Aromatic TPH (C12 - C16)	mg/kg	S4UL^	<330	<2.0	*Yes*
Aromatic TPH (C16 - C21)	mg/kg	S4UL^	<540	<10	*Yes*
Aromatic TPH (C21 - C35)	mg/kg	S4UL^	<1500	21	*Yes*
Aromatic TPH (C35 - C44)	mg/kg	S4UL^	<1500	<8.4	*Yes*
Benzene	mg/kg	S4UL^	<0.17	<0.001	*Yes*
Toluene	mg/kg	S4UL^	<290	<0.001	*Yes*
Ethylbenzene	mg/kg	S4UL^	<110	<0.001	*Yes*
O-xylene	mg/kg	S4UL^	<140	<0.001	*Yes*
M-xylene	mg/kg	S4UL^	<140	<0.001	*Yes*
P-xylene	mg/kg	S4UL^	<130		*Yes*
MTBE	mg/kg	Sail Guideline Values	<470	<0.001	*Yes*
Asbestos	mg/kg	Control of Asbestos Regulations 2006	Absent	Absent	*Yes*

APPENDIX J

Chemical Assessment Tables

Table J2. Data assessment summary - potential soil risks to human health								
Land Use Category:		**Residential with homegrown produce consumption**					**SOM:**	1.00%
Stratum:		**TOPSOIL**					**No. Samples**	1
Determinand	**GAC** mg/kg	**SSL** mg/kg (See Note A)	**Min recorded (mg/kg)**	**Max recorded (mg/kg)**	**No. Samples exceeding GAC**	**No. Samples exceeding SSL**	**US_{95} (mg/kg)**	**US_{95} > GAC**
Arsenic	28	-	12	12	0	0		
Beryllium	1.72	-	1	1	0	0		
Boron	290	-	1.7	1.7	0	0		
Cadmium	11	-	0.9	0.9	0	0		
Chromium (III)	886	-	25	25	0	0		
Chromium (VI)	2.93	-	< 1.2	< 1.2	0	0		
Copper	4220	-	51	51	0	0		
Lead (note E)	200	-	150	150	0	0		
Mercury	43.3	-	0.6	0.6	0	0		
Nickel	182	-	24	24	0	0		
Selenium	350	-	< 1	< 1	0	0		
Vanadium	320	-	26	26	0	0		
Zinc	4590	-	360	360	0	0		
Benzene	0.09	-	< 0.001	< 0.001	0	0		
Toluene	129	-	< 0.001	< 0.001	0	0		
Ethyl benzene	77	-	< 0.001	< 0.001	0	0		
m-Xylene	63.1	-	< 0.001	< 0.001	0	0		
o-Xylene	64.3	-	< 0.001	< 0.001	0	0		
p-Xylene	60.3	-	< 0.001	< 0.001	0	0		
Total Phenols (note C)	257	-	< 1	< 1	0	0		
Total Cyanide (note D)	34	-	< 1	< 1	0	0		
Aliphatic EC5-6	39.6	-	< 0.001	< 0.001	0	0		
Aliphatic EC6-8	84.9	-	< 0.001	< 0.001	0	0		
Aliphatic EC8-10	18.7	-	< 0.001	< 0.001	0	0		
Aliphatic EC10-12	93.2	50.2	< 1	< 1	0	0		
Aliphatic EC12-16	795	22.2	< 2	< 2	0	0		
Aliphatic EC16-35	128000	-	< 128	< 128	0	0		
Aromatic EC5-7	0.0528	-	< 0.001	< 0.001	0	0		
Aromatic EC7-8	129	-	< 0.001	< 0.001	0	0		
Aromatic EC8-10	25.1	-	< 0.001	< 0.001	0	0		
Aromatic EC10-12	68.3	-	< 1	< 1	0	0		
Aromatic EC12-16	137	-	2.3	2.3	0	0		
Aromatic EC16-21	291	-	16	16	0	0		
Aromatic EC21-35	1120	-	33	33	0	0		
Naphthalene	2.32	-	< 0.05	< 0.05	0	0		
Acenaphthylene	169	-	< 0.05	< 0.05	0	0		
Acenaphthene	206	-	< 0.05	< 0.05	0	0		
Fluorene	165	-	< 0.05	< 0.05	0	0		
Phenanthrene	95.8	-	0.89	0.89	0	0		
Anthracene	2330	-	< 0.05	< 0.05	0	0		
Fluoranthene	283	-	1.6	1.6	0	0		
Pyrene	616	-	1.5	1.5	0	0		
Benzo(a)Anthracene	7.79	-	0.9	0.9	0	0		
Chrysene	14.9	-	1.1	1.1	0	0		
Benzo(b)fluoranthene	2.6	-	1.3	1.3	0	0		
Benzo(k)fluoranthene	77.4	-	0.61	0.61	0	0		
Benzo(a)Pyrene	2.23	-	1	1	0	0		
Indeno(1,2,3,cd)pyrene	27.4	-	0.45	0.45	0	0		
Dibenzo(a,h)anthracene	0.254	-	< 0.05	< 0.05	0	0		
Benzo(g,h,i)perylene	316	-	0.48	0.48	0	0		
Asbestos in Soils	(Number of samples in which Asbestos detected)				0	0		

A. SSL (Soil Saturation Limit) presented for contaminants where GAC exceeds the calculated saturation limit using CLEA. Where the SSL is exceeded, there is the potential for free product.

B. Concentrations for total xylenes should be compared against m-xylene for fresh spills and o-xylene for all other cases.

C. GAC relates to phenol (C_6H_5OH) only.

D. Cyanide GAC based on acute exposure of 0-6 year old child (Atkins value).

E. Published C4SL.

E. Published C4SL.

E. Published C4SL.

Table J3. Data assessment summary - potential soil risks to human health								
Land Use Category:		**Residential with homegrown produce consumption**					**SOM:**	1.00%
Stratum:		**[MADE GROUND]**					**No. Samples**	8
Determinand	**GAC** mg/kg	**SSL** mg/kg (See Note A)	**Min recorded (mg/kg)**	**Max recorded (mg/kg)**	**No. Samples exceeding GAC**	**No. Samples exceeding SSL**	**US_{95} (mg/kg)**	**US_{95} > GAC**
Arsenic	28	-	< 1	39	1	0	36.03	EXCEED
Beryllium	1.72	-	< 0.06	1.4	0	0	1.71	OK
Boron	290	-	< 0.2	2.4	0	0	1.81	OK
Cadmium	11	-	< 0.2	1.5	0	0	1.02	OK
Chromium (III)	886	-	< 1	44	0	0	32.30	OK
Chromium (VI)	2.93	-	< 1.2	< 1.2	0	0	0.60	OK
Copper	4220	-	< 1	270	0	0	204.84	OK
Lead (note E)	200	-	< 1	260	2	0	196.91	OK
Mercury	43.3	-	< 0.3	0.8	0	0	0.85	OK
Nickel	182	-	< 1	46	0	0	36.61	OK
Selenium	350	-	< 1	3.5	0	0	2.05	OK
Vanadium	320	-	< 1	34	0	0	41.74	OK
Zinc	4590	-	< 1	1800	0	0	1297.24	OK
Benzene	0.09	-	< 0.001	< 0.001	0	0	0.00	OK
Toluene	129	-	< 0.001	< 0.001	0	0	0.00	OK
Ethyl benzene	77	-	< 0.001	< 0.001	0	0	0.00	OK
m-Xylene	63.1	-	< 0.001	< 0.001	0	0	0.00	OK
o-Xylene	64.3	-	< 0.001	< 0.001	0	0	0.00	OK
p-Xylene	60.3	-	< 0.001	< 0.001	0	0	0.00	OK
Total Phenols (note C)	257	-	< 1	< 1	0	0	0.50	OK
Total Cyanide (note D)	34	-	< 1	< 1	0	0	0.50	OK
Aliphatic EC5-6	39.6	-	< 0.001	< 0.001	0	0	0.00	OK
Aliphatic EC6-8	84.9	-	< 0.001	< 0.001	0	0	0.00	OK
Aliphatic EC8-10	18.7	-	< 0.001	< 0.001	0	0	0.00	OK
Aliphatic EC10-12	93.2	-	< 1	8	0	0	5.52	OK
Aliphatic EC12-16	795	-	< 2	240	0	0	161.13	OK
Aliphatic EC16-35	128000	-	< 32	1010	0	0	681.98	OK
Aromatic EC5-7	0.0528	-	< 0.001	< 0.001	0	0	0.00	OK
Aromatic EC7-8	129	-	< 0.001	< 0.001	0	0	0.00	OK
Aromatic EC8-10	25.1	-	< 0.001	< 0.001	0	0	0.00	OK
Aromatic EC10-12	68.3	-	< 1	3.2	0	0	2.31	OK
Aromatic EC12-16	137	-	< 2	110	0	0	74.36	OK
Aromatic EC16-21	291	-	< 10	240	0	0	164.73	OK
Aromatic EC21-35	1120	-	< 10	180	0	0	128.16	OK
Naphthalene	2.32	-	< 0.05	< 0.05	0	0	0.03	OK
Acenaphthylene	169	-	< 0.05	< 0.05	0	0	0.03	OK
Acenaphthene	206	-	< 0.05	< 0.05	0	0	0.03	OK
Fluorene	165	-	< 0.05	< 0.05	0	0	0.03	OK
Phenanthrene	95.8	-	< 0.05	2.2	0	0	1.87	OK
Anthracene	2330	-	< 0.05	0.48	0	0	0.36	OK
Fluoranthene	283	-	< 0.05	3.3	0	0	2.86	OK
Pyrene	616	-	< 0.05	2.6	0	0	2.31	OK
Benzo(a)Anthracene	7.79	-	< 0.05	1.8	0	0	1.59	OK
Chrysene	14.9	-	< 0.05	1.7	0	0	1.61	OK
Benzo(b)fluoranthene	2.6	-	< 0.05	1.9	0	0	1.89	OK
Benzo(k)fluoranthene	77.4	-	< 0.05	0.84	0	0	0.54	OK
Benzo(a)Pyrene	2.23	-	< 0.05	1.3	0	0	1.36	OK
Indeno(1,2,3,cd)pyrene	27.4	-	< 0.05	0.63	0	0	0.73	OK
Dibenzo(a,h)anthracene	0.254	-	< 0.05	< 0.05	0	0	0.03	OK
Benzo(g,h,i)perylene	316	-	< 0.05	0.72	0	0	0.77	OK
Asbestos in Soils	(Number of samples in which Asbestos detected)				1	0	0.00	0

A. SSL (Soil Saturation Limit) presented for contaminants where GAC exceeds the calculated saturation limit using CLEA. Where the SSL is exceeded, there is the potential for free product.

B. Concentrations for total xylenes should be compared against m-xylene for fresh spills and o-xylene for all other cases.

C. GAC relates to phenol (C_6H_5OH) only.

D. Cyanide GAC based on acute exposure of 0-6 year old child (Atkins value).

E. Published C4SL.

E. Published C4SL.

E. Published C4SL.

Table J4. Data assessment summary - potential soil risks to human health								
Land Use Category:		**Residential with homegrown produce consumption**					**SOM:**	1.00%
Stratum:		**[MERCIA MUDSTONE GROUP - ZONE IVb]**					**No. Samples**	3
Determinand	**GAC** mg/kg	**SSL** mg/kg (See Note A)	**Min recorded (mg/kg)**	**Max recorded (mg/kg)**	**No. Samples exceeding GAC**	**No. Samples exceeding SSL**	**US_{95} (mg/kg)**	**US_{95} > GAC**
Arsenic	28	-	< 1	23	0	0		
Beryllium	1.72	-	< 0.06	1.5	0	0		
Boron	290	-	< 0.2	0.8	0	0		
Cadmium	11	-	< 0.2	< 0.2	0	0		
Chromium (III)	886	-	< 1	35	0	0		
Chromium (VI)	2.93	-	< 1.2	< 1.2	0	0		
Copper	4220	-	< 1	28	0	0		
Lead (note E)	200	-	< 1	20	0	0		
Mercury	43.3	-	< 0.3	< 0.3	0	0		
Nickel	182	-	< 1	33	0	0		
Selenium	350	-	< 1	3.4	0	0		
Vanadium	320	-	< 1	37	0	0		
Zinc	4590	-	< 1	210	0	0		
Benzene	0.09	-	< 0.001	< 0.001	0	0		
Toluene	129	-	< 0.001	< 0.001	0	0		
Ethyl benzene	77	-	< 0.001	< 0.001	0	0		
m-Xylene	63.1	-	< 0.001	< 0.001	0	0		
o-Xylene	64.3	-	< 0.001	< 0.001	0	0		
p-Xylene	60.3	-	< 0.001	< 0.001	0	0		
Total Phenols (note C)	257	-	< 1	< 1	0	0		
Total Cyanide (note D)	34	-	< 1	< 1	0	0		
Aliphatic EC5-6	39.6	-	< 0.001	< 0.001	0	0		
Aliphatic EC6-8	84.9	-	< 0.001	< 0.001	0	0		
Aliphatic EC8-10	18.7	-	< 0.001	< 0.001	0	0		
Aliphatic EC10-12	93.2	50.2	< 1	< 1	0	0		
Aliphatic EC12-16	795	22.2	< 2	< 2	0	0		
Aliphatic EC16-35	128000	-	< 64	< 64	0	0		
Aromatic EC5-7	0.0528	-	< 0.001	< 0.001	0	0		
Aromatic EC7-8	129	-	< 0.001	< 0.001	0	0		
Aromatic EC8-10	25.1	-	< 0.001	< 0.001	0	0		
Aromatic EC10-12	68.3	-	< 1	< 1	0	0		
Aromatic EC12-16	137	-	< 2	< 2	0	0		
Aromatic EC16-21	291	-	< 10	< 10	0	0		
Aromatic EC21-35	1120	-	< 10	< 10	0	0		
Naphthalene	2.32	-	< 0.05	< 0.05	0	0		
Acenaphthylene	169	-	< 0.05	< 0.05	0	0		
Acenaphthene	206	-	< 0.05	< 0.05	0	0		
Fluorene	165	-	< 0.05	< 0.05	0	0		
Phenanthrene	95.8	-	< 0.05	< 0.05	0	0		
Anthracene	2330	-	< 0.05	< 0.05	0	0		
Fluoranthene	283	-	< 0.05	< 0.05	0	0		
Pyrene	616	-	< 0.05	< 0.05	0	0		
Benzo(a)Anthracene	7.79	-	< 0.05	< 0.05	0	0		
Chrysene	14.9	-	< 0.05	< 0.05	0	0		
Benzo(b)fluoranthene	2.6	-	< 0.05	< 0.05	0	0		
Benzo(k)fluoranthene	77.4	-	< 0.05	< 0.05	0	0		
Benzo(a)Pyrene	2.23	-	< 0.05	< 0.05	0	0		
Indeno(1,2,3,cd)pyrene	27.4	-	< 0.05	< 0.05	0	0		
Dibenzo(a,h)anthracene	0.254	-	< 0.05	< 0.05	0	0		
Benzo(g,h,i)perylene	316	-	< 0.05	< 0.05	0	0		
Asbestos in Soils	(Number of samples in which Asbestos detected)				0	0		

A. SSL (Soil Saturation Limit) presented for contaminants where GAC exceeds the calculated saturation limit using CLEA. Where the SSL is exceeded, there is the potential for free product.

B. Concentrations for total xylenes should be compared against m-xylene for fresh spills and o-xylene for all other cases.

C. GAC relates to phenol (C_6H_5OH) only.

D. Cyanide GAC based on acute exposure of 0-6 year old child (Atkins value).

E. Published C4SL.

E. Published C4SL.

E. Published C4SL.

Table J5.1. Data assessment summary – potential soil risk to vegetation and plants – Topsoil

Determinant	Assessment Criteria (mg/kg)	Measured range (mg/kg)	Measured range > Assessment Criteria? (Y/N)
Copper[1]	135	51	N
Zinc[1]	200	360	Y
Nickel[1]	75	24	N
Boron (water soluble)[2]	5	1.7	N

Table J5.2. Data assessment summary – potential soil risk to vegetation and plants – Made Ground

Determinant	Assessment Criteria (mg/kg)	Measured range (mg/kg)	Measured range > Assessment Criteria? (Y/N)
Copper[1]	135	270	Y
Zinc[1]	200	1800	Y
Nickel[1]	75	46	N
Boron (water soluble)[2]	5	2.4	N

Table J5.3. Data assessment summary – potential soil risk to vegetation and plants – Natural Soils

Determinant	Assessment Criteria (mg/kg)	Measured range (mg/kg)	Measured range > Assessment Criteria? (Y/N)
Copper[1]	135	28	N
Zinc[1]	200	210	Y
Nickel[1]	75	33	N
Boron (water soluble)[2]	5	0.8	N

[1] BSI, (2015). *Specification for topsoil and requirements for use. BS 3882:2015*. Values taken for pH 6-7

[2] Limit for phytotoxic effect. Nable, Banuelos and Paul, (1997). *Boron Toxicity*. Plant and Soil, Volume 193, pp 181-198

Table J6. Standard Water Supply Pipe Assessment

Test Group[1]	Testing Required?	PE threshold (mg/kg)	Metal Pipes / Barrier Pipe	Laboratory Detection Limit (mg/kg)	Testing UKAS accredited Y/N	Maximum site concentration[2] (mg/kg)	Locations and depths where concentrations exceed proposed pipeline threshold.
Total VOCs	Where Preliminary Risk Assessment (PRA) has identified land potentially affected by contamination	0.5	Pass	-	-	-	-
Total BTEX & MTBE		0.1	Pass	0.001	Y	<0.001	None
Total SVOCs		2	Pass	-	-	-	-
EC5–EC10 aliphatic and aromatic hydrocarbons		2	Pass	0.001	Y	<0.003	None
EC10-EC16 aliphatic and aromatic hydrocarbons		10	Pass	2	Y	<3	None
EC16-EC40 aliphatic and aromatic hydrocarbons		500	Pass	10	Y	1150	WS06 0.05m bgl
Phenols		2	Pass	1	Y	<1	None
Creosols and chlorinated phenols		2	Pass	-	-	-	-
Ethers	Only where identified	0.5	Pass	-	-	-	-
Nitrobenzene		0.5	Pass	-	-	-	-
Ketones		0.5	Pass	-	-	-	-
Aldehydes		0.5	Pass	-	-	-	-
Amines		Fail	Pass	-	-	-	-
Corrosive	Conductivity	Pass	Note[3]	-	-	-	-
	Redox			-	-	-	-
	pH			-	Y	7.5 to 9.0	-

[1] Tests Groups as per Appendix G of UKWIR Guidance.

[2] State if liquid free product is present in soil or groundwater.

[3] Threshold: For wrapped steel, corrosive if pH<7 and conductivity >400 µs/cm. For wrapped ductile iron corrosive if pH<5, Eh not neutral and conductivity >400 µs/cm. For copper, corrosive if pH<5 or>8 and Eh positive.