

Appendix D

SITE RECONNAISSANCE PHOTOGRAPHS

<i>PHOTOGRAPHIC LOG</i>	
Photo no. 1	
General	
Description: Photo facing north – Toward the front of the leisure centre	
Photo No. 2	
General	
Description: View of playing field – facing south east	

Photo No. 3	
General	
Description: View of car park – facing west	

Photo No. 4	
General	
Description: View of field to the east – facing east	

Photo No. 5	
General	
Description: Front of Cascade Leisure Centre	

Photo No. 6	
General	
Description: View of the lane down the eastern flank of the Cascade Leisure centre – Facing south	

Photo No. 7	
General	
Description: View of a closed off area which contains an electrical substation – Facing south	

Photo No. 8	
General	
Description: Tarmac area to the north of the Gravesham Leisure Centre	

Photo No. 9	
General	
Description: Netball and tennis courts to the west of the Cascade Leisure Centre	

Photo No. 10	
General	
Description: View of the landscaped area between the leisure centre and Thong Lane – facing east	

Photo No. 11	
General	
Description: View of Regans Bar & Cafe – facing east	

Appendix E

TECHNICAL BACKGROUND

H1 Desk Study

Aquifer designation and Source protection zones

Principal aquifer: layers of rock or drift deposit that have high intergranular and/or fracture permeability (usually providing a high level of water storage). They may support water supply and/or river base flow on a strategic scale.

Secondary A aquifer: permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers.

Secondary B aquifer: predominantly lower permeability layers that may store and yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering.

Secondary undifferentiated aquifer: it has not been possible to attribute either a category A or B to a rock type. In most cases this means that it was previously designated as both a minor and non-aquifer in different locations owing to the variable characteristics.

Unproductive' strata: low permeability with negligible significance for water supply or river base flow.

The EA generally adopts a three-fold classification of source protection zones (SPZ) surround abstractions for public water supply. The Site is situated in an area defined as follows:

- Zone 1 or the 'inner protection zone' is located immediately adjacent to the groundwater source and is based on a 50-day travel time from any point below the water table to the source. It is designed to protect against the effects of human activity and biological/chemical contaminants that may have an immediate effect on the source
- Zone 2 or the 'outer protection zone' is defined by a 400-day travel time from a point below the water table to the source. The travel time is designed to provide delay and attenuation of slowly degrading pollutants
- Zone 3 or the 'total catchment' is the area around the source within which all groundwater recharge is presumed to be discharged at the source.

Preliminary risk assessment methodology

LCRM outlines the framework to be followed for risk assessment in the UK. The framework is designed to be consistent with UK legislation and policies including planning. An outline conceptual model should be formed at the preliminary risk assessment stage that collates all the existing information pertaining to a site in text, tabular or diagrammatic form. The outline conceptual model identifies potentially complete (termed possible) contaminant linkages (contaminant–pathway–receptor) and is used as the basis for the design of the site investigation. The outline conceptual model is updated as further information becomes available, for example as a result of the site investigation.

Production of a conceptual model requires an assessment of risk to be made. Risk is a combination of the likelihood of an event occurring and the magnitude of its consequences. Therefore, both the

likelihood and the consequences of an event must be taken into account when assessing risk. RSK has adopted guidance provided in CIRIA C552 for use in the production of conceptual models.

The likelihood of an event can be classified on a four-point system using the following terms and definitions based on CIRIA C552:

- highly likely: the event appears very likely in the short term and almost inevitable over the long term or there is evidence at the receptor of harm or pollution
- likely: it is probable that an event will occur or circumstances are such that the event is not inevitable, but possible in the short term and likely over the long term
- low likelihood: circumstances are possible under which an event could occur, but it is not certain even in the long term that an event would occur and it is less likely in the short term
- unlikely: circumstances are such that it is improbable the event would occur even in the long term.

The severity can be classified using a similar system also based on CIRIA C552. The terms and definitions relating to severity are:

- severe: short term (acute) risk to human health likely to result in 'significant harm' as defined by the Environment Protection Act 1990, Part IIA. Short-term risk of pollution of sensitive water resources. Catastrophic damage to buildings or property. Short-term risk to an ecosystem or organism forming part of that ecosystem (note definition of ecosystem in 'Draft Circular on Contaminated Land', DETR 2000)
- medium: chronic damage to human health ('significant harm' as defined in 'Draft Circular on Contaminated Land', DETR 2000), pollution of sensitive water resources, significant change in an ecosystem or organism forming part of that ecosystem
- mild: pollution of non-sensitive water resources. Significant damage to crops, buildings, structures and services ('significant harm' as defined in 'Draft Circular on Contaminated Land', DETR 2000). Damage to sensitive buildings, structures or the environment
- minor: harm, not necessarily significant, but that could result in financial loss or expenditure to resolve. Non-permanent human health effects easily prevented by use of personal protective clothing. Easily repairable damage to buildings, structures and services.

Once the probability of an event occurring and its consequences have been classified, a risk category can be assigned according to the table below.

		Consequences			
		Severe	Medium	Mild	Minor
Probability	Highly likely	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

Definitions of these risk categories are as follows together with an assessment of the further work that may be required:

- very high: there is a high probability that severe harm could occur or there is evidence that severe harm is currently happening. This risk, if realised, could result in substantial liability; urgent investigation and remediation are likely to be required
- high: harm is likely to occur. Realisation of the risk is likely to present a substantial liability. Urgent investigation is required. Remedial works may be necessary in the short term and are likely over the long term
- moderate: it is possible that harm could arise, but it is unlikely that the harm would be severe and it is more likely that the harm would be relatively mild. Investigation is normally required to clarify the risk and determine the liability. Some remedial works may be required in the longer term
- low: it is possible that harm could occur, but it is likely that if realised this harm would at worst normally be mild
- very low: there is a low possibility that harm could occur and if realised the harm is unlikely to be severe.

H2 Site Investigation Methodology

Ground gas monitoring

An infrared gas meter was used to measure gas flow, concentrations of carbon dioxide (CO₂), methane (CH₄) and oxygen (O₂) in percentage by volume, while hydrogen sulphide (H₂S) and carbon monoxide (CO) were recorded in parts per million. Initial and steady state concentrations were recorded. In addition, during the first monitoring round, all wells were screened with a PID to establish if there are any interferences and cross-sensitivity of other hydrocarbons with the infrared gas meter.

Reuse of suitable materials

The Definition of Waste: Development Industry Code of Practice (CL:AIRE, 2011) (CoP) was developed in consultation with the Environment Agency and development industry to enable the re-use of materials under certain scenarios and subject to demonstrating that specific criteria are met. The current reuse scenarios covered by the CoP comprise

- reuse on the site of origin (with or without treatment)
- direct transfer of clean and natural soils between sites
- use in the development of land other than the site of origin following treatment at an authorised Hub site (including a fixed soil treatment facility).

The importation of made ground soils (irrespective of contamination status) or crushed demolition materials is not permitted currently under the CoP and requires either a standard rules environmental permit or a U1 waste exemption (see below).

In the context of excavated materials used on-sites undergoing development, four factors are considered to be of particular relevance in determining if the material is a waste or when it ceases to be waste:

- the aim of the Waste Framework Directive is not undermined, i.e. if the use of the material will create an unacceptable risk of pollution of the environment or harm to human health it is likely to be waste
- the material is certain to be used
- the material is suitable for use both chemically and geotechnically
- only the required quantity of material will be used.

The CoP requires the preparation of a materials management plan (MMP) that confirms the above factors will be met. This plan needs to be reviewed by a 'Qualified Person' (QP) who will then issue a declaration form to the EA. As the project progresses, data must be collated and on completion a verification report produced that shows the MMP was followed and describes any changes.

The MMP establishes whether specific materials are classified as waste and how excavated materials will be treated and/or reused in line with the CoP. The MMP is likely to form part of the site waste management plan.

Appendix F

EXPLORATORY HOLE RECORDS

KEY TO EXPLORATORY HOLE LOGS - SUMMARY OF GRAPHIC SYMBOLS

WATER COLUMN SYMBOLS



First water strike, second water strike etc.

Standing water level following first strike, standing water level following second strike etc.

Seepage.

Standing water level recorded at documented date.

MATERIAL GRAPHIC LEGENDS



CLAY



CLAY with
BOULDERS



CLAY with
COBBLES



Clayey
GRAVEL



Clayey
gravelly
SAND



Gravelly
clayey
SAND



Clayey
gravelly
SAND
with
BOULDERS



Coal



Clayey
SAND



Clayey
sandy
GRAVEL



GRAVEL



Gravelly
CLAY



Gravelly
silty CLAY



Silty
gravelly
CLAY



Gravelly
SAND



Gravelly
SAND
with
BOULDERS



MADE
GROUND



Mudstone



Possible
MADE
GROUND



SAND

INSTRUMENTATION SYMBOLS



Backfill



Bentonite
cement
grout



Bentonite
seal



Concrete



Gravel
filter



Sand filter



Stopcock
cover



Upstanding
cover



Plain pipe



Slotted
pipe

KEY TO EXPLORATORY HOLE LOGS - SUMMARY OF ABBREVIATIONS

SAMPLING

Sample type codes

B	=	Bulk disturbed sample.
C	≡	Core sample.
CBR	=	CBR mould sample.
D	=	Small disturbed sample.
DSPT	=	Small disturbed sample originating from SPT test.
ES	=	Soil sample for environmental testing.
NR	=	
U	=	Undisturbed driven tube sample - Number of blows indicated. % recovery reported.

Undisturbed sample detail codes

U ₍₁₀₀₎	=	100mm diameter undisturbed sample.
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IN-SITU TESTING

SPT _(c)	=	Standard Penetration Test using a solid 60 degree cone.
SPT	=	Standard Penetration Test using split spoon sampler. (SPT _(NR) indicates 'No Sample Recovery').
	=	* denotes extrapolated N value. NP denotes 'No Penetration'.
HP	=	Hand Penetrometer Test. Value given as shear strength c_u , in kPa.
V	≡	Field Vane Test. Peak value (c_u) & Residual value (c_r), given as shear strength in kPa.

ROTARY DRILLING INFORMATION

W	=	Water flush returns (%)
TCR	=	Total core recovery (%)
SCR	=	Solid core recovery (%)
RQD	=	Rock quality designations (%)
If	=	Fracture spacing (mm).

In the fracture column (i) denotes discontinuity is infilled (refer to Fracture Table for details).

Where variable the minimum - average - maximum spacing may be quoted.
'NI' denotes non-intact core. 'NA' denotes not applicable.

All lengths used to determine rock core mechanical properties taken along the centre line of the core.
Obvious induced fractures have been ignored.

The assessment of solid core is based on lengths that show a full diameter and not necessarily a full circumference.

AZCL = Assessed zone of core loss.

ADDITIONAL NOTES

1. All soil and rock descriptions and legends in general accordance with BS EN ISO 14688-1, 14688-2, 14689-1, and BS5930:2015.
2. Material types divided by a broken line (- - -) indicates an unclear boundary.
3. The data on any sheet within the report showing the AGS icon is available in the AGS format.

BOREHOLE LOG

Contract: Gravesham Leisure Centre			Client: Furness Partnership		Borehole: BH1
Contract Ref: 52511	Start: 17.03.23 End: 20.03.23	Ground Level: 65.73	National Grid Co-ordinate: E:567025.2 N:171668.2		Sheet: 1 of 1

Samples and In-situ Tests				Water	Backfill & Instrumentation	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results						
0.05	1	ES	1xT+1xJ+1xV			Bituminous bound layer. (MADE GROUND)	65.68	0.05	
0.05		PID	0.0ppm				65.43	0.30	
0.30	2	D					64.83	0.90	
0.50	3	D				Sandy gravel comprising MOT Type 1 aggregate. Strong sulphur aroma noted throughout. (MADE GROUND)			
1.00	4	D							
1.20-1.65	1	SPT	N=6			Firm orangish brown gravelly sandy silty CLAY with rootlets. Gravel is subangular to rounded fine to medium flint. Sand is fine to medium. (REWORKED GROUND)		(4.10)	
1.75	5	D							
2.00-2.45	2	SPT	N=29						
2.75	6	D				Cream gravelly SILT. Gravel is subangular fine to medium chalk. (WHITE CHALK SUBGROUP)			
3.75-4.20	3	SPT	N=13						
4.00-4.45	4	SPT	N=41						
4.75	7	D					60.73	5.00	
5.00-5.45	5	SPT	N=14			Structureless CHALK composed of cream, gravelly SILT. Gravel is weak medium density white with black specks and subrounded with rare flint fragments. (Grade Dm) (WHITE CHALK SUBGROUP)			
5.00	8	D							
5.50-5.95	6	SPT	N=16						
7.50	9	D							
8.00-8.45	7	SPT	N=30						
9.00	10	D							
9.50-9.95	8	SPT	N=16						
10.50	11	D							
11.00-11.45	9	SPT	N=17						
12.50-12.95	10	SPT	N=51					(15.45)	
13.50	12	D							
14.00-14.45	11	SPT	N=24						
15.00	13	D				... Flint band at 15.00m to 15.20m depth.			
15.50-15.95	12	SPT	N=26						
16.00	14	D				... Flint band at 16.50m to 16.70m depth.			
17.00-17.45	13	SPT	N=36						
18.00	15	D							
18.50-18.95	14	SPT	N=28						
19.50	16	D							
20.00-20.45	15	SPT	N=49				45.28	20.45	
Borehole terminated at 20.45m depth.									

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)	
						0.00	0.20	00:30	1. Position checked with Ground Penetrating Radar, CAT and Genny prior to excavation. 2. Inspection pit hand dug to 1.20m depth. 3. Down borehole checks for buried ferrous objects carried out during drilling by specialist unexploded ordnance (UXO) officer using magnetometer at regular intervals. 4. No groundwater encountered. 5. 50mm diameter standpipe piezometer (complete with flush protective cover) installed to 20.00m depth on completion. Response zone 1.00m to 20.00m depth.
Method Used: Inspection pit + Cable percussion						All dimensions in metres			Scale: 1:117
Plant Used: Pilcon Wayfarer 2000		Drilled By: PJ Drilling		Logged By: JCurnow		Checked By:			

BOREHOLE LOG

Contract: Gravesham Leisure Centre			Client: Furness Partnership		Borehole: BH2
Contract Ref: 52511	Start: 21.03.23 End: 22.03.23	Ground Level: 65.91	National Grid Co-ordinate: E:567099.7 N:171674.3		Sheet: 1 of 1

Samples and In-situ Tests				Water	Backfill & Instrumentation	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results						
0.30	1	D				Grass over firm dark brown gravelly sandy silty CLAY with rootlets. Gravel is subangular fine chalk. Sand is fine to medium. (TOPSOIL)	65.51	0.40	
0.50	2	D					64.91	1.00	
1.00	3	D					64.41	1.50	
1.20-1.65	1	SPT	N=40			Reddish brown slightly gravelly silty CLAY with rootlets. Gravel is subangular to subrounded fine to medium flint (REWORKED GROUND).			
1.75	4	D							
2.00-2.45	2	SPT	N=9			Brown gravelly clayey SILT. Gravel is subangular to subrounded fine to coarse of flint and chalk (REWORKED GROUND).			
2.75	5	D							
3.00-3.45	3	SPT(c)	N=33			Structureless CHALK composed of cream, gravelly SILT. Gravel is weak medium density white with black specks and subrounded with rare flint fragments. (Grade Dm) (WHITE CHALK SUBGROUP)			
3.75	6	D				. . . Flint band at 3.00m to 3.20m depth.			
4.00-4.45	4	SPT	N=16						
4.75	7	D							
5.00-5.45	5	SPT	N=17						
5.00	8	D							
6.50-6.95	6	SPT	N=17						
7.50	9	D							
8.00-8.45	7	SPT	N=20						
9.00	10	D							
9.50-9.95	8	SPT(c)	N=67						
10.50	11	D							
11.00-11.45	9	SPT	N=18						
12.00	12	D							
12.50-12.95	10	SPT	N=21						
13.50	13	D							
14.00-14.45	11	SPT	N=24						
15.00	14	D							
15.50-15.95	12	SPT	N=38						
16.50	15	D							
17.00-17.45	13	SPT	N=28						
18.00	16	D				. . . Flint band from 17.50m to 17.80m depth.			
18.50-18.95	14	SPT	N=29						
19.50	17	D							
20.00-20.45	15	SPT	N=43						
							45.46	20.45	
Borehole terminated at 20.45m depth.									

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)	
						3.00	17.50	00:30	1. Position checked with Ground Penetrating Radar, CAT and Genny prior to excavation. 2. Inspection pit hand dug to 1.20m depth. 3. Down borehole checks for buried ferrous objects carried out during drilling by specialist unexploded ordnance (UXO) officer using magnetometer at regular intervals. 4. No groundwater encountered. 5. 50mm diameter standpipe piezometer (complete with flush protective cover) installed to 19.75m depth on completion. Response zone 1.00m to 20.00m depth.
						3.20	17.70	00:30	
All dimensions in metres Scale: 1:117									
Method Used: Inspection pit + Cable percussion	Plant Used: Pilcon Wayfarer 2000		Drilled By: PJ Drilling		Logged By: JCurnow		Checked By: AGS		

BOREHOLE LOG

Contract: Gravesham Leisure Centre			Client: Furness Partnership		Borehole: BH3
Contract Ref: 52511	Start: 23.03.23 End: 24.03.23	Ground Level: 66.92	National Grid Co-ordinate: E:567107.6 N:171632.8		Sheet: 1 of 1

Samples and In-situ Tests				Water	Backfill & Instrumentation	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results						
0.30	1	D				Grass over dark brown gravelly silty clayey fine to medium SAND with rootlets. Gravel is rounded to subangular fine to medium flint, chalk and brick. (TOPSOIL)	66.62	0.30	
0.50	2	D						(1.20)	
1.00	3	D							
1.20-1.65	1	SPT(c)	N=17				65.42	1.50	
1.75	4	D				Dark brown slightly sandy gravelly CLAY with rootlets. Gravel is subangular to subrounded fine to coarse of flint, chalk and brick. (MADE GROUND)	65.22	1.70	
2.00-2.45	2	SPT	N=10						
2.75	5	D				Firm brown mottled creamish white gravelly silty CLAY. Gravel is subangular to subrounded fine to medium chalk (REWORKED GROUND).			
3.00-3.45	3	SPT	N=53						
3.75	6	D				Structureless CHALK composed of cream, gravelly SILT. Gravel is weak medium density white with black specks and subrounded with rare flint fragments. (Grade Dm) (WHITE CHALK SUBGROUP)			
4.00-4.45	4	SPT	N=18			... Flint band from 3.00m to 3.20m depth.			
4.50	7	D							
5.00-5.45	5	SPT	N=23						
6.00	8	D							
6.50-6.95	6	SPT	N=22						
7.50	9	D							
8.00-8.45	7	SPT	N=25						
9.00	10	D							
9.50-9.95	8	SPT	N=27						
10.50	11	D						(18.75)	
11.00-11.45	9	SPT	N=27						
12.00	12	D							
12.50-12.95	10	SPT	N=28						
13.50-13.95	12	SPT	N=35						
13.50	13	D							
14.00-14.45	11	SPT	N=60						
15.00	14	D				... Flint band from 16.00m to 16.20m depth.			
16.50	15	D							
17.00-17.45	13	SPT	N=35						
18.00	16	D							
18.50-18.80	14	SPT(c)	17,18/20,15 for 75mm			... Flint band from 18.50m to 18.80m depth.			
19.50	17	D							
20.00-20.45	15	SPT	N=36				46.47	20.45	
Borehole terminated at 20.45m depth.									

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)	
						3.00	3.20	00:30	1. Position checked with Ground Penetrating Radar, CAT and Genny prior to excavation. 2. Inspection pit hand dug to 1.20m depth. 3. Down borehole checks for buried ferrous objects carried out during drilling by specialist unexploded ordnance (UXO) officer using magnetometer at regular intervals. 4. No groundwater encountered. 5. 50mm diameter standpipe piezometer (complete with flush protective cover) installed to 17.66m depth on completion. Response zone 1.00m to 20.00m depth.
						16.00	18.50	00:30	
						16.20	18.80	00:30	
All dimensions in metres Scale: 1:117									
Method Used: Inspection pit + Cable percussion	Plant Used: Pilcon Wayfarer 2000		Drilled By: PJ Drilling		Logged By: JCurnow		Checked By: AGS		

WINDOW SAMPLE LOG

Contract: Gravesham Leisure Centre			Client: Furness Partnership			Window Sample: WS1		
Contract Ref: 52511		Start: 16.03.23 End: 16.03.23		Ground Level: 65.08		National Grid Co-ordinate: E:567056.6 N:171710.6		Sheet: 1 of 1

Progress		Samples / Tests			Water	Backfill & Instrumentation	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Window Run	Depth	No	Type	Results						
	0.00-0.30 0.00	1	ES PID	1xT+1xJ+1xV 0.0ppm			Grass over firm dark brown gravelly sandy silty CLAY with rootlets. Sand is fine to medium. Gravel is subangular to surrounded fine to medium chalk and flint. (TOPSOIL)	64.78	(0.30)	
							Light brown gravelly silty clayey fine to medium SAND with rootlets. Gravel is subangular to subrounded flint and chalk. (REWORKED GROUND)	64.28	(0.50)	
	0.80-1.10	2	D				Firm light brown gravelly sandy silty CLAY with rootlets. Sand is fine to medium. Gravel is angular to rounded fine to coarse flint and chalk. (REWORKED GROUND)	63.88	(0.40)	
	1.00-1.45	1	SPT	N=25			Creamy light brown gravelly sandy SILT. Sand is fine to medium. Gravel is subangular fine chalk. (REWORKED GROUND)	63.78	1.20	
	1.30-1.60	3	D				Light brown gravelly fine to medium SAND. Gravel is angular to subangular fine to coarse flint. (REWORKED GROUND)	63.48	(0.30)	
							Structureless CHALK composed of cream, gravelly SILT. Gravel is weak medium density white with black specks and subrounded. (Grade Dm) (WHITE CHALK SUBGROUP)			
	2.00-2.45	2	SPT	N=13			... Flint band at 3.00m to 3.10m depth.		(2.85)	
	2.50-2.80	4	D							
	3.00-3.45	3	SPT	N=19						
	3.20-3.50	5	D							
	4.00-4.45	4	SPT	N=14						
							Window sample borehole terminated at 4.45m depth.	60.63	4.45	

Drilling Progress and Water Observations						General Remarks			
Date	Time	Borehole Depth (m)	Casing Depth (m)	Borehole Diameter (mm)	Water Depth (m)	- Position checked with Ground Penetrating Radar, CAT and Genny prior to excavation. - Inspection pit hand dug to 1.20m depth. - Down borehole checks for buried ferrous objects carried out during drilling by specialist unexploded ordnance (UXO) officer using magnetometer at regular intervals. - No groundwater encountered. 33mm diameter standpipe piezometer (complete with flush protective cover) installed to 4.00m depth on completion. Response zone 1.00m to 4.00m depth.			
						All dimensions in metres		Scale:	1:28
Method Used:	Inspection pit + Tracked window			Plant Used:	Premier 110	Drilled By:	PJ Drilling	Logged By:	JCurnow
						Checked By:			

WINDOW SAMPLE LOG

Contract: Gravesham Leisure Centre			Client: Furness Partnership		Window Sample: WS2
Contract Ref: 52511	Start: 16.03.23 End: 16.03.23	Ground Level: 65.83	National Grid Co-ordinate: E:567119.2 N:171686.2		Sheet: 1 of 1

Progress		Samples / Tests			Water	Backfill & Instrumentation	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Window Run	Depth	No	Type	Results						
	0.00-0.30 0.00	1	ES PID	1xT+1xJ+1xV 0.0ppm			Grass over: firm dark brown gravelly sandy silty CLAY with rootlets. Gravel is subangular fine chalk. Sand is fine to medium. (TOPSOIL)	65.53	0.30	
							Firm light brown gravelly sandy silty CLAY with rootlets. Sand is fine to medium. Gravel is subangular to surrounded fine to coarse flint and chalk. (REWORKED GROUND)	65.33	0.50	
	0.70-1.00	2	D				Orangish brown gravelly silty fine to medium SAND. Gravel is rounded to subangular medium flint. (REWORKED GROUND)	65.13	0.70	
	1.00-1.45	1	SPT	N=10			Structureless CHALK composed of cream, gravelly SILT. Gravel is weak medium density white with black specks and subrounded. (Grade Dm) (WHITE CHALK SUBGROUP)	64.83	1.00	
	1.70-2.00	3	D				Structureless CHALK composed of cream, gravelly SILT. Gravel is weak medium density white with black specks and subrounded. (Grade Dm) (WHITE CHALK SUBGROUP)			
	2.00-2.45	2	SPT	N=16						
	2.70-3.00	4	D						(3.45)	
	3.00-3.45	3	SPT	N=17						
	3.70-4.00	5	D							
	4.00-4.45	4	SPT	N=24						
							Window sample borehole terminated at 4.45m depth.	61.38	4.45	

Drilling Progress and Water Observations						General Remarks			
Date	Time	Borehole Depth (m)	Casing Depth (m)	Borehole Diameter (mm)	Water Depth (m)	- Position checked with Ground Penetrating Radar, CAT and Genny prior to excavation. - Inspection pit hand dug to 1.20m depth. - Down borehole checks for buried ferrous objects carried out during drilling by specialist unexploded ordnance (UXO) officer using magnetometer at regular intervals. - No groundwater encountered. 33mm diameter standpipe piezometer (complete with flush protective cover) installed to 4.00m depth on completion. Response zone 1.00m to 4.00m depth.			
						All dimensions in metres	Scale:	1:28	
Method Used:	Inspection pit + Tracked window			Plant Used:	Premier 110	Drilled By:	PJ Drilling	Logged By:	JCurnow
								Checked By:	

WINDOW SAMPLE LOG

Contract: Gravesham Leisure Centre			Client: Furness Partnership		Window Sample: WS3
Contract Ref: 52511	Start: 16.03.23 End: 16.03.23	Ground Level: 66.87	National Grid Co-ordinate: E:567138.0 N:171650.0		Sheet: 1 of 1

Progress		Samples / Tests			Water	Backfill & Instrumentation	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Window Run	Depth	No	Type	Results						
	0.00-0.30 0.00	1	ES PID	1xT+1xJ+1xV 0.0ppm			Grass over dark brown gravelly silty clayey fine to medium SAND with rootlets. Gravel is rounded to subangular fine to medium flint, chalk and brick. (TOPSOIL)	66.37	(0.50) 0.50	
	0.70-1.00	2	D				Light brown gravelly sandy SILT. Gravel is subangular to surrounded fine to medium flint and chalk. (REWORKED GROUND)	65.97	(0.40) 0.90	
	1.00-1.45	1	SPT	N=23			Structureless CHALK composed of cream, gravelly SILT. Gravel is weak medium density white with black specks and subrounded. (Grade Dm) (WHITE CHALK SUBGROUP)	65.07	(0.90) 1.80	
	1.80-2.00	3	D				Structureless CHALK composed of cream, gravelly SILT. Gravel is weak medium density white with black specks and subrounded. (Grade Dm) (WHITE CHALK SUBGROUP)	64.67	(0.40) 2.20	
	2.00-2.45	2	SPT	N=18			Structureless CHALK composed of silty subangular GRAVEL. Clasts are weak, medium density white with black specks. Matrix is creamy white. (Grade Dc) (WHITE CHALK SUBGROUP) ... Flint band.	63.87	(0.80) 3.00	
	3.00-3.45	3	SPT	N=22			Structureless CHALK composed of cream, gravelly SILT. Gravel is weak medium density white with black specks and subrounded. (Grade Dm) (WHITE CHALK SUBGROUP)	62.42	(1.45) 4.45	
	3.50-3.80	4	D							
	4.00-4.45	4	SPT	N=39						
							Window sample borehole terminated at 4.45m depth.			

Drilling Progress and Water Observations						General Remarks			
Date	Time	Borehole Depth (m)	Casing Depth (m)	Borehole Diameter (mm)	Water Depth (m)	- Position checked with Ground Penetrating Radar, CAT and Genny prior to excavation. - Inspection pit hand dug to 1.20m depth. - Down borehole checks for buried ferrous objects carried out during drilling by specialist unexploded ordnance (UXO) officer using magnetometer at regular intervals. - No groundwater encountered. 33mm diameter standpipe piezometer (complete with flush protective cover) installed to 3.92m depth on completion. Response zone 0.92m to 3.92m depth.			
						All dimensions in metres		Scale:	1:28
Method Used:	Inspection pit + Tracked window			Plant Used:	Premier 110	Drilled By:	PJ Drilling	Logged By:	JCurnow
								Checked By:	

WINDOW SAMPLE LOG

Contract: Gravesham Leisure Centre			Client: Furness Partnership			Window Sample: WS4		
Contract Ref: 52511		Start: 16.03.23 End: 16.03.23		Ground Level: 67.27		National Grid Co-ordinate: E:567047.3 N:171597.0		Sheet: 1 of 1

Progress		Samples / Tests			Water	Backfill & Instrumentation	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Window Run	Depth	No	Type	Results						
	0.00-0.30 0.00	1	ES PID	1xT+1xJ+1xV 0.0ppm			Grass ove: dark brown silty clayey fine to medium SAND with rootlets. (TOPSOIL)	66.97	0.30	
							Firm light brown sandy silty CLAY. (REWORKED GROUND)		(0.60)	
	0.70-1.00	2	D					66.37	0.90	
	1.00-1.45	1	SPT	N=38			Structureless CHALK composed of cream, gravelly SILT. Gravel is weak medium density white with black specks and subrounded. (Grade Dm) (WHITE CHALK SUBGROUP)	66.17	1.10	
							Structureless CHALK composed of silty subangular GRAVEL. Clasts are weak, medium density white with black specks. Matrix is creamy white. (Grade Dc) (WHITE CHALK SUBGROUP)			
	1.70-2.00	3	D				... Flint band at 1.10m depth.			
	2.00-2.45	2	SPT	N=33					(2.05)	
	2.40-3.00	4	D							
	2.70-3.15	3	SPT	N=45						
								64.12	3.15	
							Window sample borehole terminated at 2.7m depth due to refusal on flint.			

Drilling Progress and Water Observations						General Remarks			
Date	Time	Borehole Depth (m)	Casing Depth (m)	Borehole Diameter (mm)	Water Depth (m)	- Position checked with Ground Penetrating Radar, CAT and Genny prior to excavation. - Inspection pit hand dug to 1.20m depth. - Down borehole checks for buried ferrous objects carried out during drilling by specialist unexploded ordnance (UXO) officer using magnetometer at regular intervals. - No groundwater encountered. 33mm diameter standpipe piezometer (complete with flush protective cover) installed to 2.91m depth on completion. Response zone 0.91m to 2.91m depth.			
						All dimensions in metres		Scale:	1:28
Method Used:	Inspection pit + Tracked window			Plant Used:	Premier 110	Drilled By:	PJ Drilling	Logged By:	JCurnow
						Checked By:			

WINDOW SAMPLE LOG

Contract: Gravesham Leisure Centre			Client: Furness Partnership			Window Sample: WS5		
Contract Ref: 52511		Start: 16.03.23 End: 16.03.23		Ground Level: 66.49		National Grid Co-ordinate: E:566961.6 N:171662.6		Sheet: 1 of 1

Progress		Samples / Tests			Water	Backfill & Instrumentation	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Window Run	Depth	No	Type	Results						
	0.00 0.10-0.40	1	PID ES	0.0ppm 1xT+1xJ+1xV			Grass over dark brown silty fine to medium SAND with rootlets. (TOPSOIL)	66.39	0.10	
							Dark brown sandy silty CLAY with frequent brick and concrete. Sand is fine to coarse. (MADE GROUND)	66.09	0.40	
	0.60-0.90	2	D				Dark greyish brown to dark greenish brown clayey medium SAND with rootlets. (REWORKED GROUND)	65.59	0.90	
	1.00-1.45 1.00-1.30	1 3	SPT D	N=27			Orangish brown to dark brown gravelly sandy silty CLAY. Gravel is angular to subrounded fine to coarse flint. (REWORKED GROUND)	65.09	1.40	
							Structureless CHALK composed of cream, gravelly SILT. Gravel is weak medium density white with black specks and subrounded. (Grade Dm) (WHITE CHALK SUBGROUP)	64.49	2.00	
	2.00-2.45	2	SPT	N=41			Structureless CHALK composed of silty subangular GRAVEL. Clasts are weak, medium density white with black specks. Matrix is creamy white. (Grade Dc) (WHITE CHALK SUBGROUP)		(1.15)	
	2.40-2.70	4	D							
	2.70-3.15	3	SPT	N=44						
							Window sample borehole terminated at 2.7m depth due to refusal on flint.	63.34	3.15	

Drilling Progress and Water Observations						General Remarks			
Date	Time	Borehole Depth (m)	Casing Depth (m)	Borehole Diameter (mm)	Water Depth (m)	- Position checked with Ground Penetrating Radar, CAT and Genny prior to excavation. - Inspection pit hand dug to 1.20m depth. - Down borehole checks for buried ferrous objects carried out during drilling by specialist unexploded ordnance (UXO) officer using magnetometer at regular intervals. - No groundwater encountered. 33mm diameter standpipe piezometer (complete with flush protective cover) installed to 2.90m depth on completion. Response zone 0.90m to 2.90m depth.			
						All dimensions in metres Scale: 1:28			
Method Used:	Inspection pit + Tracked window		Plant Used:	Premier 110		Drilled By:	PJ Drilling	Logged By:	JCurnow
						Checked By:			

WINDOW SAMPLE LOG

Contract: Gravesham Leisure Centre			Client: Furness Partnership			Window Sample: WS6		
Contract Ref: 52511		Start: 16.03.23 End: 16.03.23	Ground Level: 65.94		National Grid Co-ordinate: E:567013.1 N:171694.6		Sheet: 1 of 1	

Progress		Samples / Tests			Water	Backfill & Instrumentation	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Window Run	Depth	No	Type	Results						
	0.00-0.30 0.00	1	ES PID	1xT+1xJ+1xV 0.0ppm			Grass over dark brown gravelly silty fine to medium SAND with rootlets. Gravel is subangular fine to medium flint and chalk (TOPSOIL)	65.54	0.40	
	0.70-1.00	2	D				Dark brown gravelly silty clayey fine to medium SAND with rootlets. Gravel is subangular to surrounded fine to medium flint and chalk. (REWORKED GROUND)	64.94	1.00	
	1.00-1.45	1	SPT	N=21			Stiff orangish brown silty CLAY. (REWORKED GROUND) ... Chalk gravel at 1.3m	64.34	1.60	
	1.70-2.00	3	D				Structureless CHALK composed of cream, gravelly SILT. Gravel is weak medium density white with black specks and subrounded. (Grade Dm) (WHITE CHALK SUBGROUP)	63.84	2.10	
	2.00-2.45	2	SPT	N=19			Structureless CHALK composed of cream, gravelly SILT. Gravel is weak medium density white with black specks and subrounded. (Grade Dm) (WHITE CHALK SUBGROUP)			
	2.70-3.00	4	D							
	3.00-3.45	3	SPT	N=12						
	3.70-4.00	5	D							
	4.00-4.45	4	SPT	N=14						
							Window sample borehole terminated at 4.45m depth.			

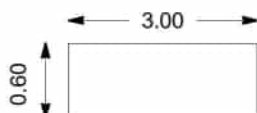
Drilling Progress and Water Observations						General Remarks			
Date	Time	Borehole Depth (m)	Casing Depth (m)	Borehole Diameter (mm)	Water Depth (m)	- Position checked with Ground Penetrating Radar, CAT and Genny prior to excavation. - Inspection pit hand dug to 1.20m depth. - Down borehole checks for buried ferrous objects carried out during drilling by specialist unexploded ordnance (UXO) officer using magnetometer at regular intervals. - No groundwater encountered. 33mm diameter standpipe piezometer (complete with flush protective cover) installed to 4.03m depth on completion. Response zone 1.03m to 4.03m depth.			
						All dimensions in metres		Scale:	1:28
Method Used:	Inspection pit + Tracked window			Plant Used:	Premier 110	Drilled By:	PJ Drilling	Logged By:	JCurnow
								Checked By:	

TRIAL PIT LOG

Contract: Gravesham Leisure Centre		Client: Furness Partnership		Trial Pit: SA1
Contract Ref: 52511	Start: 20.03.23 End: 20.03.23	Ground Level: 62.58	National Grid Co-ordinate: E:566971.6 N:171797.2	Sheet: 1 of 1

Samples and In-situ Tests				Water	Backfill	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results						
0.00-0.20 0.00	1	ES PID	1xT+1xJ+1xV 0.0ppm			Bituminous bound layer. (MADE GROUND)	62.53 62.38	0.05 0.20	
0.40-0.80 0.40	2	D V	$c_u=39$			Black gravelly coarse SAND with frequent brick and scalplings (MADE GROUND) Firm light brown gravelly sandy silty CLAY with rootlets and occasional brick. Gravel is subangular fine to medium flint and chalk. Sand is fine to medium. (MADE GROUND)		(0.80)	
1.40-1.80	3	D				Structureless CHALK composed of cream, gravelly SILT. Gravel is weak medium density white with black specks and subrounded. (Grade Dm) (WHITE CHALK SUBGROUP) ... At 2.2m depth band of subangular cobble size flints.	61.58	1.00	
2.40-2.80	4	D				... From 2.8m yellow staining.			
						Trial pit terminated at 3.00m depth.	59.58	3.00	

Plan (Not to Scale)



General Remarks

1. Position checked with Ground Penetrating Radar, CAT and Genny prior to excavation.
2. Checks for buried ferrous objects carried out during excavation by specialist unexploded ordnance (UXO) officer using magnetometer.
3. Trial pit remained dry and stable during excavation.
4. Trial pit backfilled with arisings upon completion.

All dimensions in metres

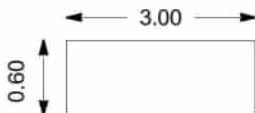
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Method Used: Machine dug	Plant Used: 13 Ton Tracked Excavator	Logged By: JCurnow	Checked By: AGS
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TRIAL PIT LOG

Contract: Gravesham Leisure Centre			Client: Furness Partnership		Trial Pit: SA2
Contract Ref: 52511	Start: 20.03.23 End: 20.03.23	Ground Level: 62.99	National Grid Co-ordinate: E:566991.5 N:171748.7		Sheet: 1 of 1

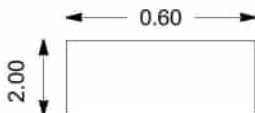
Samples and In-situ Tests				Water	Backfill	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results						
0.00-0.20 0.00	1	ES PID	1xT+1xJ+1xV 0.0ppm			Bituminous bound layer (MADE GROUND)	62.94 62.79	0.05 0.20	
0.20-0.40	2	ES	1xT+1xJ+1xV			Black gravelly fine to coarse SAND with frequent scalplings and ash. (MADE GROUND)	62.59	0.40	
0.60-1.00	3	D				Dark brown gravelly fine to coarse SAND with frequent brick and scalplings and rare metal. (MADE GROUND)	62.39	0.60	
						Creamy light brown gravelly sandy SILT. Gravel is subangular to surrounded fine to coarse white chalk with black specks. (WHITE CHALK SUBGROUP)			
						Structureless CHALK composed of cream, gravelly SILT. Gravel is weak medium density white with black specks and subrounded. (Grade Dm) (WHITE CHALK SUBGROUP)			
1.60-2.00	4	D						(2.40)	
2.60-3.00	5	D							
							59.99	3.00	
Trial pit terminated at 3.00m depth.									

Plan (Not to Scale)		General Remarks			
		- Position checked with Ground Penetrating Radar, CAT and Genny prior to excavation. - Checks for buried ferrous objects carried out during excavation by specialist unexploded ordnance (UXO) officer using magnetometer. - Trial pit remained dry and stable during excavation. - Trial pit backfilled with arisings upon completion.			
		All dimensions in metres		Scale:	1:28
Method Used: Machine dug	Plant Used: 13 Ton Tracked Excavator	Logged By: JCurnow	Checked By:		

TRIAL PIT LOG

Contract: Gravesham Leisure Centre			Client: Furness Partnership			Trial Pit: SA3		
Contract Ref: 52511		Start: 21.03.23 End: ???	Ground Level: 65.38		National Grid Co-ordinate: E:566928.9 N:171729.6		Sheet: 1 of 1	

Samples and In-situ Tests				Water	Backfill	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend	
Depth	No	Type	Results							
0.00-0.10 0.00-0.30 0.00	1 2	ES ES PID	0.0ppm			Grass over: dark brown slightly sandy clayey SILT with roots and rootlets. Sand is fine to coarse. (TOPSOIL)	64.98	(0.40)		
0.40-0.80	3	D				Firm dark brown gravelly silty CLAY. Gravel is subangular to subrounded medium to coarse flint and chalk (REWORKED GROUND). ... greenish grey mottled brown pockest of silty SAND.	64.48	0.90		
						Brown mottled white slightly sandy slightly gravelly clayey SILT. Gravel is subangular to subrounded fine to coarse chalk (REWORKED GROUND).	63.98	1.40		
1.80-2.10	4	D				Structureless CHALK composed of cream, gravelly SILT. Gravel is weak medium density white with black specks and subrounded. (Grade Dm) (WHITE CHALK SUBGROUP) ... Cobbles and coarse gravels of flint observed	62.58	2.80		
						Trial pit terminated at 2.80m depth.				

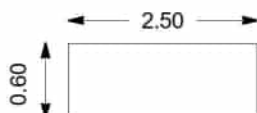
Plan (Not to Scale) 			General Remarks 1. Position checked with Ground Penetrating Radar, CAT and Genny prior to excavation. 2. Checks for buried ferrous objects carried out during excavation by specialist unexploded ordnance (UXO) officer using magnetometer. 3. Trial pit remained dry and stable during excavation. 4. Trial pit backfilled with arisings upon completion.					
			All dimensions in metres			Scale: 1:28		
Method Used: Machine dug	Plant Used: 13 Ton Tracked Excavator		Logged By: SGurung		Checked By:			

TRIAL PIT LOG

Contract: Gravesham Leisure Centre		Client: Furness Partnership		Trial Pit: TP1
Contract Ref: 52511	Start: 21.03.23 End: 21.03.23	Ground Level: 68.00	National Grid Co-ordinate: E:567026.5 N:171559.5	Sheet: 1 of 1

Samples and In-situ Tests				Water	Backfill	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results						
0.00-0.30 0.00	1	ES PID	1xT+1xJ+1xV 0.0ppm			Grass over dark brown silty clayey SAND with rootlets. (TOPSOIL)		(0.30)	
0.30-0.60 0.50	2	D V	$c_u=55$			Firm orangish brown sandy silty CLAY. (REWORKED GROUND)	67.70	0.30	
0.70-1.00	3	D				Structureless CHALK composed of cream, gravelly SILT. Gravel is weak medium density white with black specks and subrounded with flint cobbles. (Grade Dm) (WHITE CHALK SUBGROUP)	67.30	0.70	
						Structureless CHALK composed of cream, gravelly SILT. Gravel is weak medium density white with black specks and subrounded with flint cobbles. (Grade Dm) (WHITE CHALK SUBGROUP)	66.80	1.20	
						... From 1.9m yellowish light brown staining.		(1.80)	
2.60-3.00	4	D							
						Trial pit terminated at 3.00m depth.	65.00	3.00	

Plan (Not to Scale)



General Remarks

1. Position checked with Ground Penetrating Radar, CAT and Genny prior to excavation.
2. Checks for buried ferrous objects carried out during excavation by specialist unexploded ordnance (UXO) officer using magnetometer.
3. Trial pit remained dry and stable during excavation.
4. Trial pit backfilled with arisings upon completion.

All dimensions in metres

Scale: **1:28**

Method Used:

Machine dug

Plant Used:

13 Ton Tracked Excavator

Logged By:

JCurnow

Checked By:

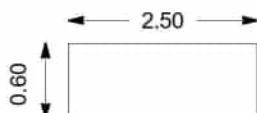


TRIAL PIT LOG

Contract: Gravesham Leisure Centre		Client: Furness Partnership		Trial Pit: TP2
Contract Ref: 52511	Start: 21.03.23 End: 21.03.23	Ground Level: 65.70	National Grid Co-ordinate: E:567068.2 N:171689.8	Sheet: 1 of 1

Samples and In-situ Tests				Water	Backfill	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results						
0.00-0.10 0.00	1	ES PID	1xT+1xJ+1xV 0.0ppm			Grass over dark brown silty SAND with rootlets. (TOPSOIL) Orange to light brown fine to coarse SAND with plastic bag. (MADE GROUND)	65.60	0.10	
						Firm dark brown gravelly sandy silty CLAY with rootlets. Gravel is angular to surrounded fine to coarse flint and chalk. Sand is fine to medium. (REWORKED GROUND)	65.30	0.40	
0.60-1.00	2	D				Firm orangish brown gravelly sandy silty CLAY with rootlets. Gravel is subangular to surrounded fine to medium chalk. Sand is fine to medium. (REWORKED GROUND)	65.10	0.60	
1.00-1.40	3	D				Structureless CHALK composed of cream, gravelly SILT. Gravel is weak medium density white with black specks and subrounded with flint cobbles. (Grade Dm) (WHITE CHALK SUBGROUP)	64.70	1.00	
						Structureless CHALK composed of cream, gravelly SILT. Gravel is weak medium density white with black specks and subrounded with flint cobbles. (Grade Dm) (WHITE CHALK SUBGROUP) ... High flint content.	64.30	1.40	
						... From 2.4m yellowish staining.		(1.60)	
2.60-3.00	4	D							
						Trial pit terminated at 3.00m depth.	62.70	3.00	

Plan (Not to Scale)



General Remarks

1. Position checked with Ground Penetrating Radar, CAT and Genny prior to excavation.
2. Checks for buried ferrous objects carried out during excavation by specialist unexploded ordnance (UXO) officer using magnetometer.
3. Trial pit remained dry and stable during excavation.
4. Trial pit backfilled with arisings upon completion.

All dimensions in metres

Scale: **1:28**

Method Used:

Machine dug

Plant Used:

13 Ton Tracked Excavator

Logged By:

JCurnow

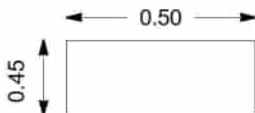
Checked By:



TRIAL PIT LOG

Contract: Gravesham Leisure Centre		Client: Furness Partnership		Trial Pit: HP1
Contract Ref: 52511	Start: 24.03.23 End: 24.03.23	Ground Level: 62.88	National Grid Co-ordinate: E:567038.0 N:171764.0	Sheet: 1 of 1

Samples and In-situ Tests				Water	Backfill	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results						
0.00-0.30 0.00	1	ES PID	1xT+1xJ+1xV 0.0ppm			Dark brown gravelly clayey fine to coarse SAND with brick tarmac and plastic. (MADE GROUND)		(0.40)	
						Concrete. (MADE GROUND)	62.48	0.40	
						Structureless CHALK composed of cream, gravelly SILT. Gravel is weak medium density white with black specks and subrounded. (Grade Dm) (WHITE CHALK SUBGROUP) Trial pit terminated at 0.70m depth.	62.23 62.18	0.65 0.70	

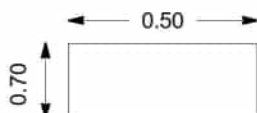
Plan (Not to Scale) 		General Remarks 1. Position checked with Ground Penetrating Radar, CAT and Genny prior to excavation. 2. Checks for buried ferrous objects carried out during excavation by specialist unexploded ordnance (UXO) officer using magnetometer. 3. Trial pit remained dry and stable during excavation. 4. Trial pit backfilled with arisings upon completion.		
Method Used: Hand dug Plant Used: Hand tools		All dimensions in metres Scale: 1:28 Logged By: JCurnow Checked By: AGS		

TRIAL PIT LOG

Contract: Gravesham Leisure Centre		Client: Furness Partnership		Trial Pit: HP2
Contract Ref: 52511	Start: 24.03.23 End: 24.03.23	Ground Level: 64.60	National Grid Co-ordinate: E:567069.0 N:171758.0	Sheet: 1 of 1

Samples and In-situ Tests				Water	Backfill	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results						
0.00-0.30 0.00	1	ES PID	1xT+1xJ+1xV 0.0ppm			Grass over: dark brown silty fine to coarse SAND with bricks and concrete. (MADE GROUND) ... Blue insulation foam observed at 0.90m depth.		(1.40)	
							63.20	1.40	
Trial pit terminated at 1.40m depth due to collapse.									

Plan (Not to Scale)



General Remarks

1. Position checked with Ground Penetrating Radar, CAT and Genny prior to excavation.
2. Checks for buried ferrous objects carried out during excavation by specialist unexploded ordnance (UXO) officer using magnetometer.
3. Trial pit was unstable below 0.50m depth.
4. Trial pit remained dry during excavation.
5. Trial pit backfilled with arisings upon completion.

All dimensions in metres

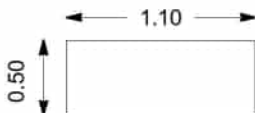
Scale: **1:28**

Method Used: Hand dug	Plant Used: Hand tools	Logged By: JCurnow	Checked By: AGS
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TRIAL PIT LOG

Contract: Gravesham Leisure Centre		Client: Furness Partnership		Trial Pit: HP3
Contract Ref: 52511	Start: 23.03.23 End: 23.03.23	Ground Level: 64.59	National Grid Co-ordinate: E:567125.0 N:171747.0	Sheet: 1 of 1

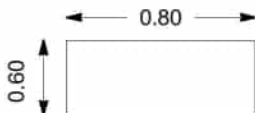
Samples and In-situ Tests				Water	Backfill	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results						
0.00		PID	0.0ppm			Grass over: dark brown gravelly silty fine to medium SAND. Gravel is subangular to subrounded fine to medium flint.	64.39	0.20	
0.20-0.40	1	ES	1xT+1xJ+1xV			(TOPSOIL)			
						Light brown gravelly coarse SAND with brick and concrete. (MADE GROUND)	64.19	0.40	
						Concrete. (MADE GROUND)	63.94	0.65	
						Light brown gravelly sandy SILT with concrete. Gravel is subangular medium chalk. Sand is fine to medium. (MADE GROUND) Trial pit terminated at 0.65m depth.			

Plan (Not to Scale) 		General Remarks 1. Position checked with Ground Penetrating Radar, CAT and Genny prior to excavation. 2. Checks for buried ferrous objects carried out during excavation by specialist unexploded ordnance (UXO) officer using magnetometer. 3. Trial pit remained dry and stable during excavation. 4. Trial pit backfilled with arisings upon completion.		
Method Used: Hand dug		Plant Used: Hand tools		Logged By: JCurnow
Scale: 1:28		Checked By:		

TRIAL PIT LOG

Contract: Gravesham Leisure Centre		Client: Furness Partnership		Trial Pit: HP4
Contract Ref: 52511	Start: 23.03.23 End: 23.03.23	Ground Level: 64.83	National Grid Co-ordinate: E:567087.2 N:171717.4	Sheet: 1 of 1

Samples and In-situ Tests				Water	Backfill	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results						
0.00-0.30 0.00	1	ES PID	1xT+1xJ+1xV 0.0ppm			Grass over: light brown gravelly fine to medium SAND with frequent bricks. Gravel is subangular fine to coarse flint. (MADE GROUND)	64.58	0.25	
						Concrete. (MADE GROUND)	64.33	0.50	
						Creamy light brown gravelly SILT. Gravel is subangular fine to medium chalk (REWORKED GROUND).	64.18	0.65	
						Trial pit terminated at 0.65m depth.			

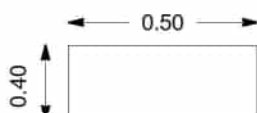
Plan (Not to Scale) 		General Remarks 1. Position checked with Ground Penetrating Radar, CAT and Genny prior to excavation. 2. Checks for buried ferrous objects carried out during excavation by specialist unexploded ordnance (UXO) officer using magnetometer. 3. Trial pit remained dry and stable during excavation. 4. Trial pit backfilled with arisings upon completion.		
Method Used: Hand dug		Plant Used: Hand tools		Logged By: JCurnow
Scale: 1:28		Checked By:		

TRIAL PIT LOG

Contract: Gravesham Leisure Centre		Client: Furness Partnership		Trial Pit: HP5
Contract Ref: 52511	Start: 23.03.23 End: 23.03.23	Ground Level: 63.70	National Grid Co-ordinate: E:567028.1 N:171735.7	Sheet: 1 of 1

Samples and In-situ Tests				Water	Backfill	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results						
0.00-0.30 0.00	es	ES PID	1xT+1xJ+1xV 0.0ppm			Grass over: dark brown gravelly silty clayey fine to medium SAND with rootlets and concrete. Gravel is subangular fine to medium chalk. (MADE GROUND)		(0.40)	
						Brick and concrete fill. (MADE GROUND)	63.30	0.40	
						Concrete. (MADE GROUND)	62.90 62.85	0.80 0.85	
Trial pit terminated at 0.85m depth.									

Plan (Not to Scale)



General Remarks

1. Position checked with Ground Penetrating Radar, CAT and Genny prior to excavation.
2. Checks for buried ferrous objects carried out during excavation by specialist unexploded ordnance (UXO) officer using magnetometer.
3. Trial pit remained dry and stable during excavation.
4. Trial pit backfilled with arisings upon completion.

All dimensions in metres

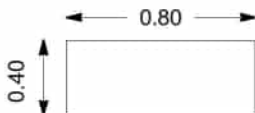
Scale: **1:28**

Method Used: Hand dug	Plant Used: Hand tools	Logged By: JCurnow	Checked By: AGS
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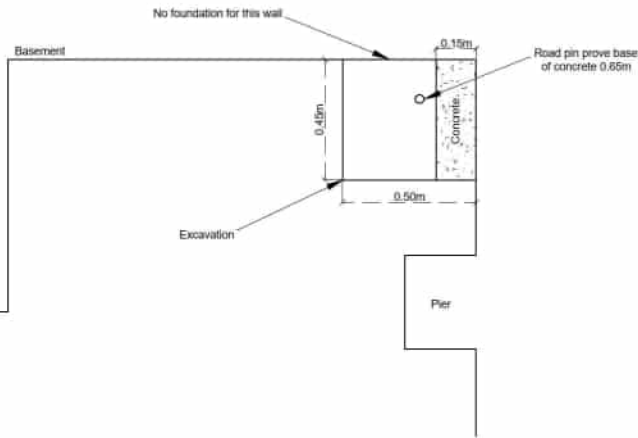
TRIAL PIT LOG

Contract: Gravesham Leisure Centre			Client: Furness Partnership			Trial Pit: HP6		
Contract Ref: 52511		Start: 24.03.23 End: 24.03.23	Ground Level: 63.26		National Grid Co-ordinate: E:567072.9 N:171776.7		Sheet: 1 of 1	

Samples and In-situ Tests				Water	Backfill	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results						
						Grass over: light brown gravelly silty fine to medium SAND with rare metal and wood. Gravel is subangular fine to coarse chalk. (MADE GROUND)	62.96	(0.30) 0.30	
						Creamy light brown gravelly SILT. Gravel is subangular to subrounded fine to coarse chalk and flint cobbles (REWORKED GROUND).		(0.90) 1.20	
						Concrete. (MADE GROUND) Trial pit terminated at 1.20m depth due to collapse.	62.06	1.20	

Plan (Not to Scale)			General Remarks					
			1. Position checked with Ground Penetrating Radar, CAT and Genny prior to excavation. 2. Checks for buried ferrous objects carried out during excavation by specialist unexploded ordnance (UXO) officer using magnetometer. 3. Trial pit was unstable below 0.50m depth. 4. Trial pit remained dry during excavation. 5. Trial pit backfilled with arisings upon completion.					
			All dimensions in metres			Scale: 1:28		
Method Used: Hand dug		Plant Used: Hand tools		Logged By: JCurnow		Checked By:		

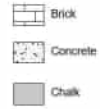
HP1 - Plan View



HP1 - Side View



LEGEND



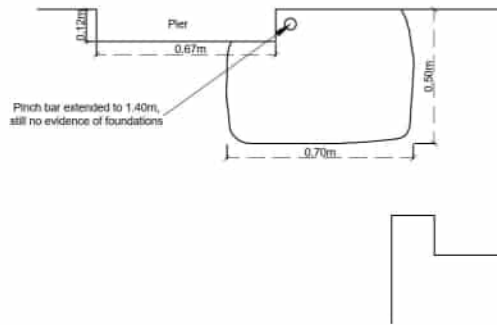
C01	05.04.23	First Issue	LS	JC	JC
Rev	Date	Amendment	Drawn	Chkd	Appd

RSK GEOSCIENCES
 Arterley Court
 Half Moon Lane
 Tonbridge, Kent
 TN11 8RJ

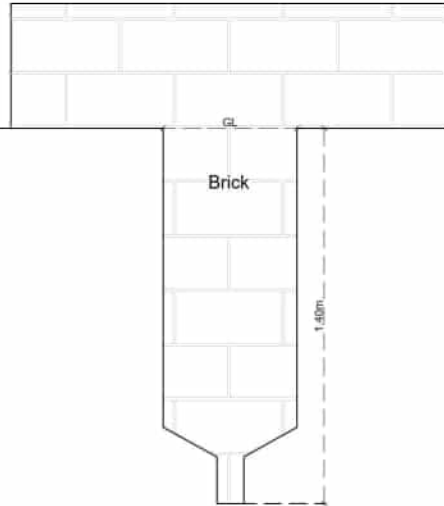
Tel: +44(0)1332 542740
 Email: info@rsk.co.uk
 Web: www.rsk.co.uk

Client Furness Partnership		
Project Name Gravesham Leisure Centre		
Description HP1 Foundation Inspection Pit Diagram		
Project ID 52511	Drawing no. 51201	Revision C01
File name 52511-TO-512-SS-D-C-51201-C01		
Dimensions m	Scale 1:20	Size A4

HP2 - Plan View



HP2 - Side View



LEGEND

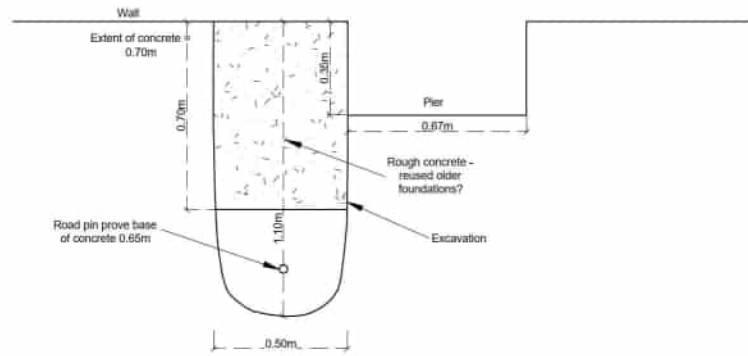


C01	05.04.23	First Issue	LS	JC	JC
Rev	Date	Amendment	Drawn	Chkd	Appd

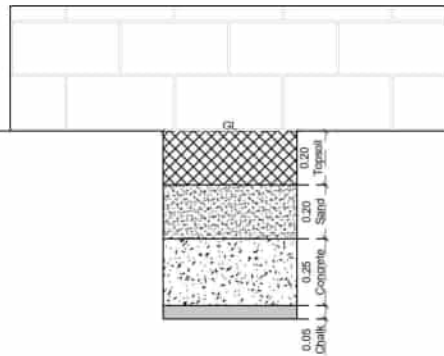
RSK GEOSCIENCES
 Arterley Court
 Half Moon Lane
 Tonbridge, Kent
 TN11 8RJ
 Tel: +44(0)1332 542740
 Email: info@rsk.co.uk
 Web: www.rsk.co.uk

Client Furness Partnership		
Project Name Gravesham Leisure Centre		
Description HP2 Foundation Inspection Pit Diagram		
Project ID 52511	Drawing no. 51202	Revision C01
File name 52511-TO-512-SS-D-C-51202-C01		
Dimensions m	Scale 1:20	Size A4

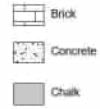
HP3 - Plan View



HP3 - Side View



LEGEND

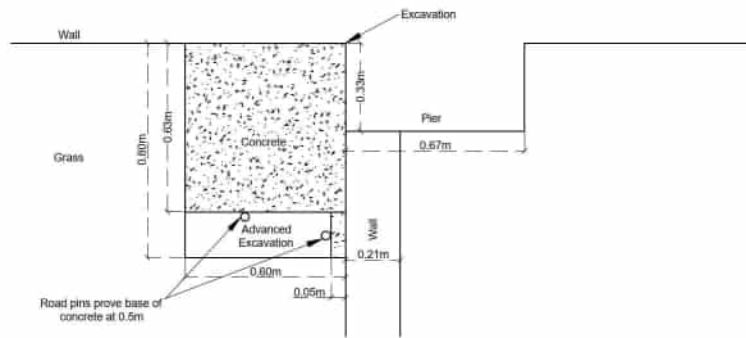


C01	05.04.23	First Issue	LS	JC	JC
Rev	Date	Amendment	Drawn	Chkd	Appd

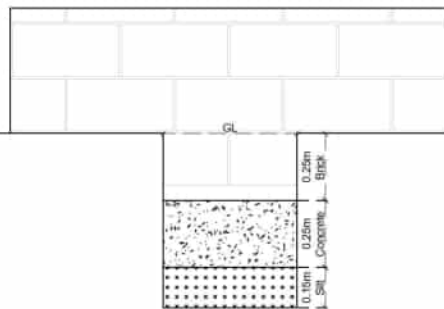
RSK GEOSCIENCES
 Arterley Court
 Half Moon Lane
 Tonbridge, Kent
 TN11 9HR
 Tel: +44(0)1323 542740
 Email: info@rsk.co.uk
 Web: www.rsk.co.uk

Client Furness Partnership		
Project Name Gravesham Leisure Centre		
Description HP3 Foundation Inspection Pit Diagram		
Project ID 52511	Drawing no. 51203	Revision C01
File name 52511-TO-512-SS-D-C-51203-C01		
Dimensions m	Scale 1:20	Size A4
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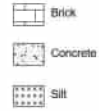
HP4 - Plan View



HP4 - Side View



LEGEND



C01	05.04.23	First Issue	LS	JC	JC
Rev	Date	Amendment	Drawn	Chkd	Appd

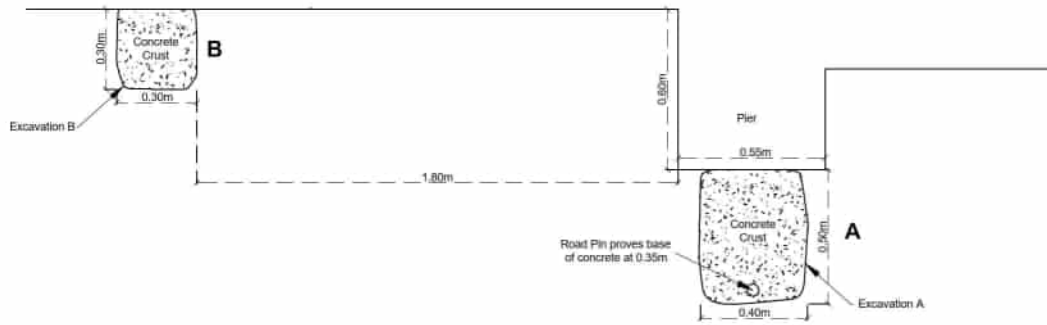
RSK GEOSCIENCES

Arbury Court
Half Moon Lane
Tonbridge, Kent
TN11 9RJ

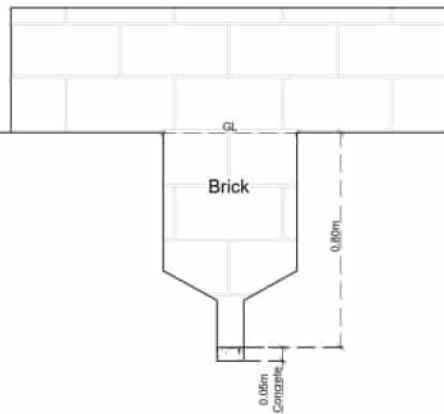
Tel: +44(0)1332 642740
Email: info@rsk.co.uk
Web: www.rsk.co.uk

Client Furness Partnership		
Project Name Gravesham Leisure Centre		
Description HP4 Foundation Inspection Pit Diagram		
Project ID 52511	Drawing no. 51204	Revision C01
File name 52511-TO-512-SS-D-C-51204-C01		
Dimensions m	Scale 1:20	Size A4

HP5 - Plan View



HP5 - Side View



LEGEND



C01	05.04.23	First Issue	LS	JC	JC
Rev	Date	Amendment	Drawn	Chkd	Appd



**RSK
GEOSCIENCES**

Arkeley Court
Half Moon Lane
Tonbridge, Kent
TN11 8RJ

Tel: +44(0)1332 642740
Email: info@rsk.co.uk
Web: www.rsk.co.uk

Client

Furness Partnership

Project Name

Gravesham Leisure Centre

Description

HP5 Foundation Inspection Pit Diagram

Project ID	Drawing no.	Revision
52511	51205	C01

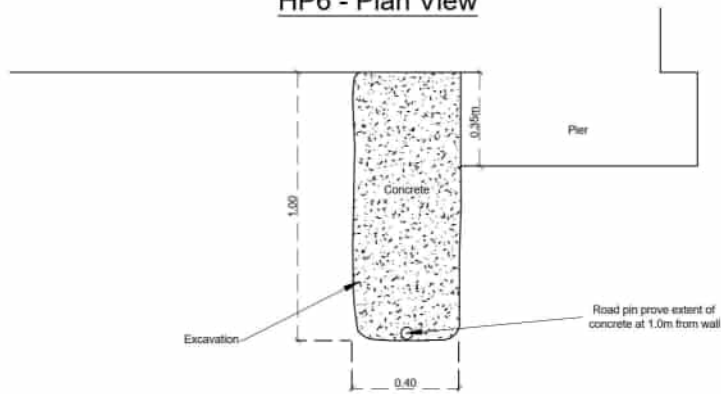
File name

52511-TO-512-SS-D-C-51205-C01

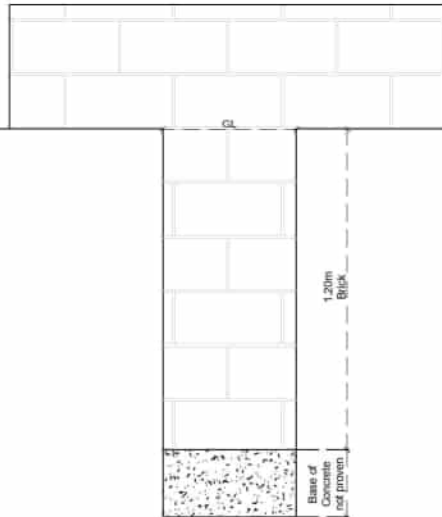
Dimensions	Scale	Size
m	1:20	A4



HP6 - Plan View



HP6 - Side View



LEGEND

C01	05.04.23	First Issue	LS	JC	JC
Rev	Date	Amendment	Drawn	Chkd	Appd



RSK
GEOSCIENCES

Arkeley Court
Half Moon Lane
Tonbridge, Kent
TN11 8RJ

Tel: +44(0)1332 642740
Email: info@rsk.co.uk
Web: www.rsk.co.uk

Client

Furness Partnership

Project Name

Gravesham Leisure Centre

Description

HP6 Foundation Inspection Pit Diagram

Project ID

52511

Drawing no.

51206

Revision

C01

File name

52511-TO-512-SS-D-C-51206-C01

Dimensions

m

Scale

1:20

Size

A4



DCP TEST RESULTS - DEPTH vs CBR VALUE

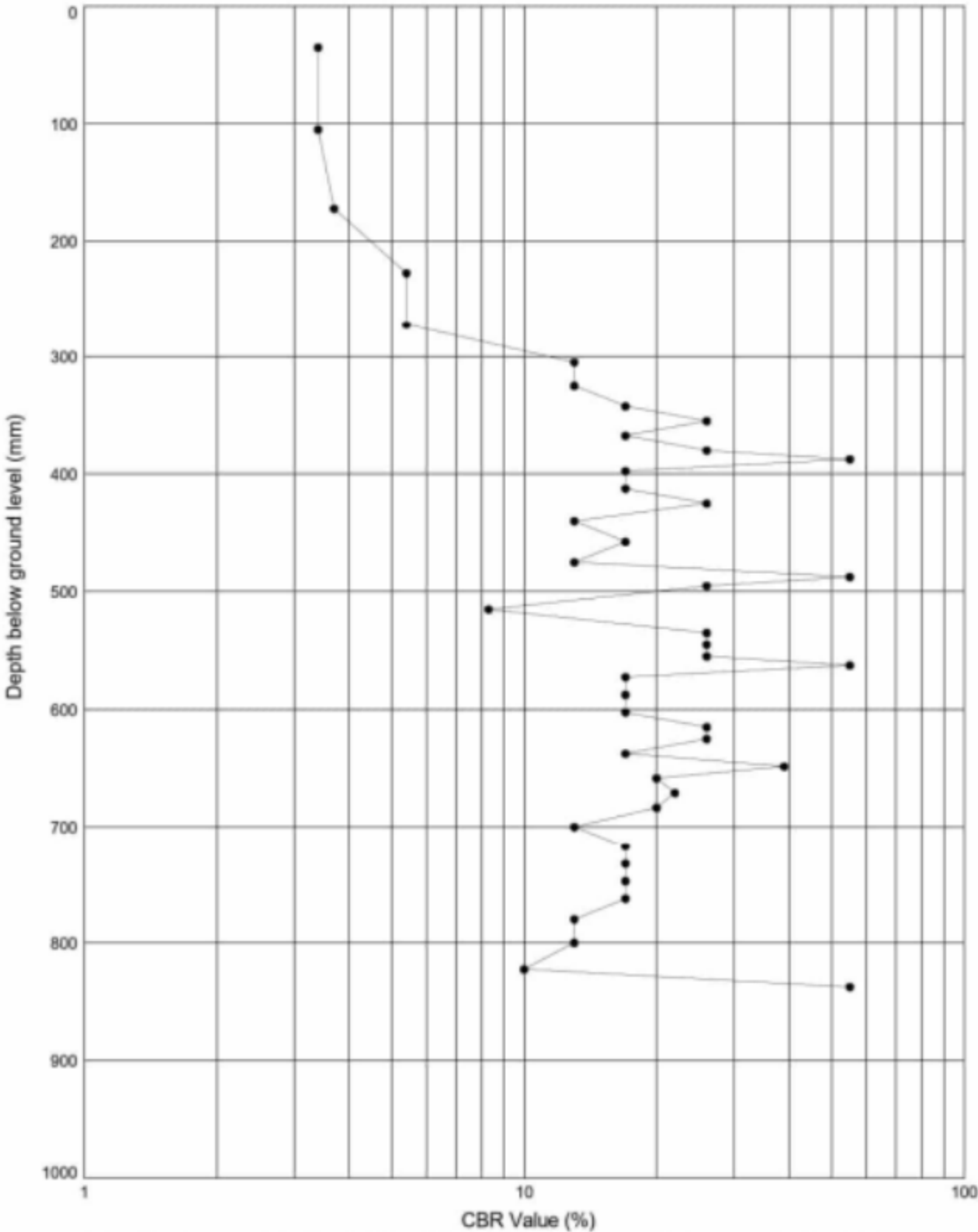
Position Ref : BH3

Test Date : 27.03.23

Test Number : 1

Ground Level: 66.92

National Grid Co-ordinates: E:567107.6 N:171632.8



Notes: CBR values calculated after TRRL Road Note 8 method. Values over 100% are plotted on the 100% line.

Anerley Court
Half Moon Lane
Hildenborough
Tonbridge
Kent, TN11 9HU

Complied By	Date	Checked By	Date
	29/03/23		
Contract	Contract Ref:		
Gravesham Leisure Centre	52511		

DCP TEST RESULTS - DEPTH vs CBR VALUE

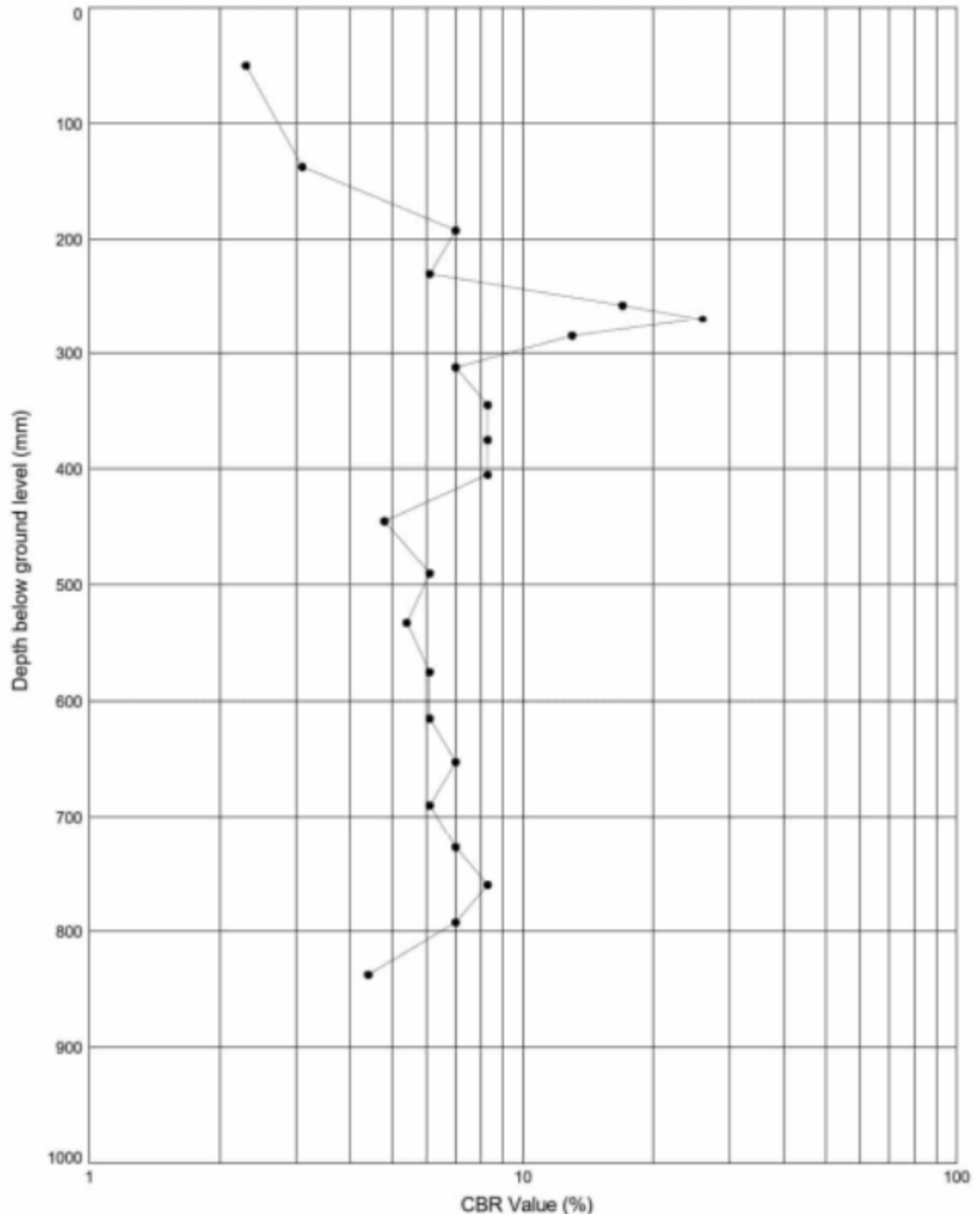
Position Ref : SA3

Test Date : 27.03.23

Test Number : 1

Ground Level: 65.38

National Grid Co-ordinates: E:566928.9 N:171729.6



Notes: CBR values calculated after TRRL Road Note 8 method. Values over 100% are plotted on the 100% line.

Anerley Court
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Kent, TN11 9HU

Complied By

Date

Checked By

Date

29/03/23

Contract

Gravesham Leisure Centre

Contract Ref:

52511

DCP TEST RESULTS - DEPTH vs CBR VALUE

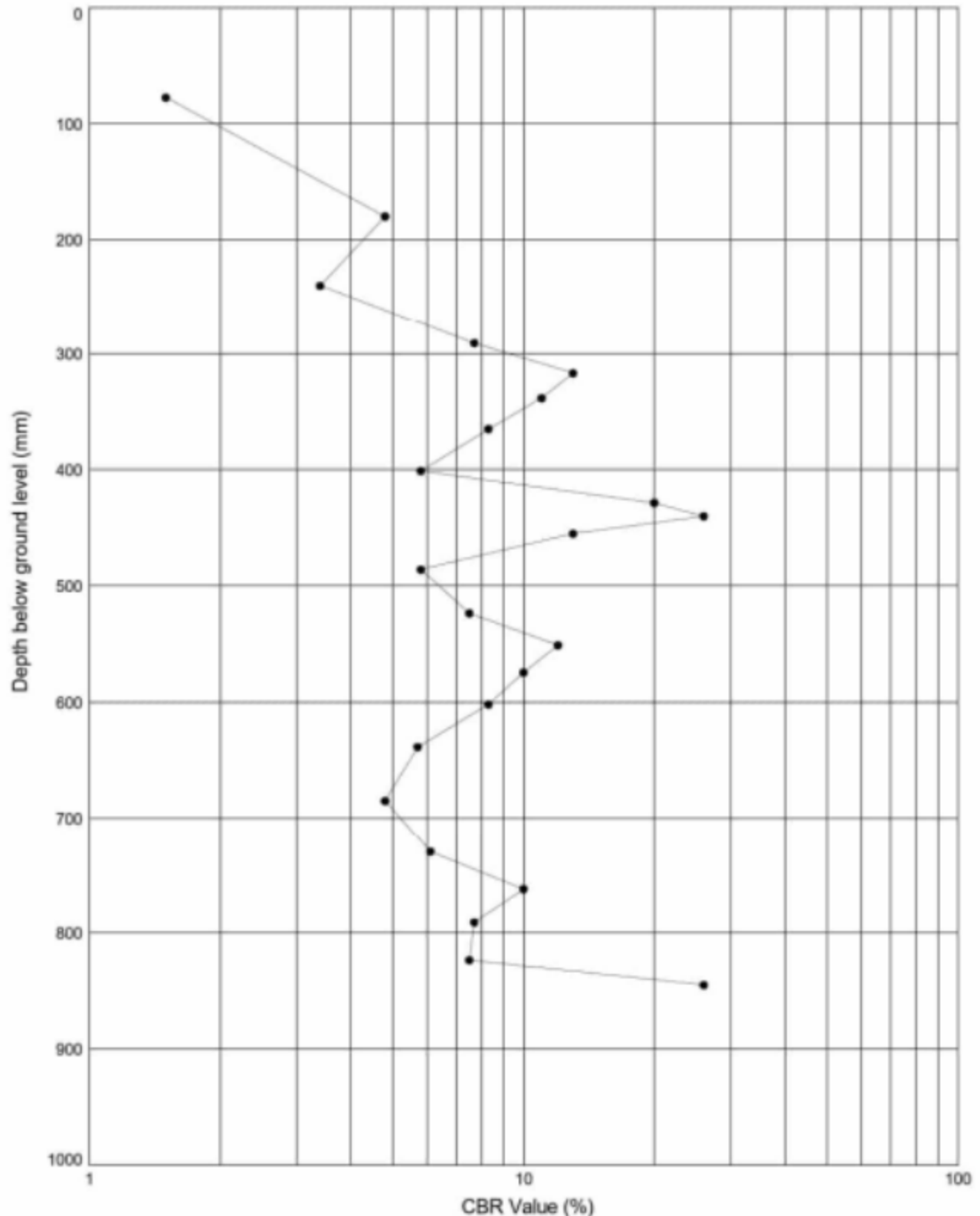
Position Ref : **TP1**

Test Date : **27.03.23**

Test Number : **1**

Ground Level: **68.00**

National Grid Co-ordinates: **E:567026.5 N:171559.5**



Notes: CBR values calculated after TRRL Road Note 8 method. Values over 100% are plotted on the 100% line.

Anerley Court
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Complied By

Date

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Date

29/03/23

Contract

Gravesham Leisure Centre

Contract Ref:

52511

DCP TEST RESULTS - DEPTH vs CBR VALUE

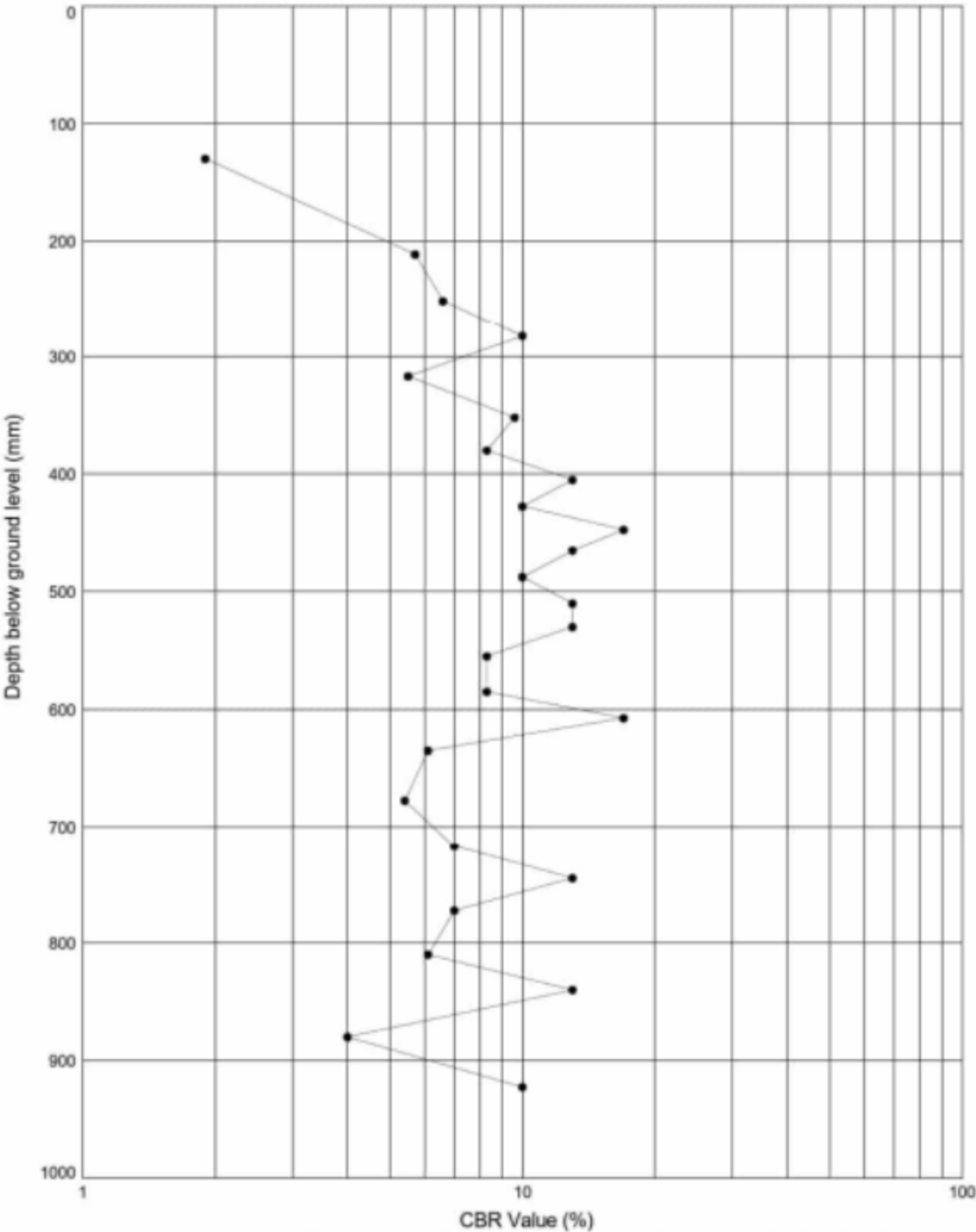
Position Ref : TP2

Test Date : 27.03.23

Test Number : 1

Ground Level: 65.70

National Grid Co-ordinates: E:567068.2 N:171689.8



Notes: CBR values calculated after TRRL Road Note 8 method. Values over 100% are plotted on the 100% line.

Anerley Court
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Kent, TN11 9HU

Complied By	Date	Checked By	Date
	29/03/23		
Contract	Contract Ref:		
Gravesham Leisure Centre	52511		

DCP TEST RESULTS - DEPTH vs CBR VALUE

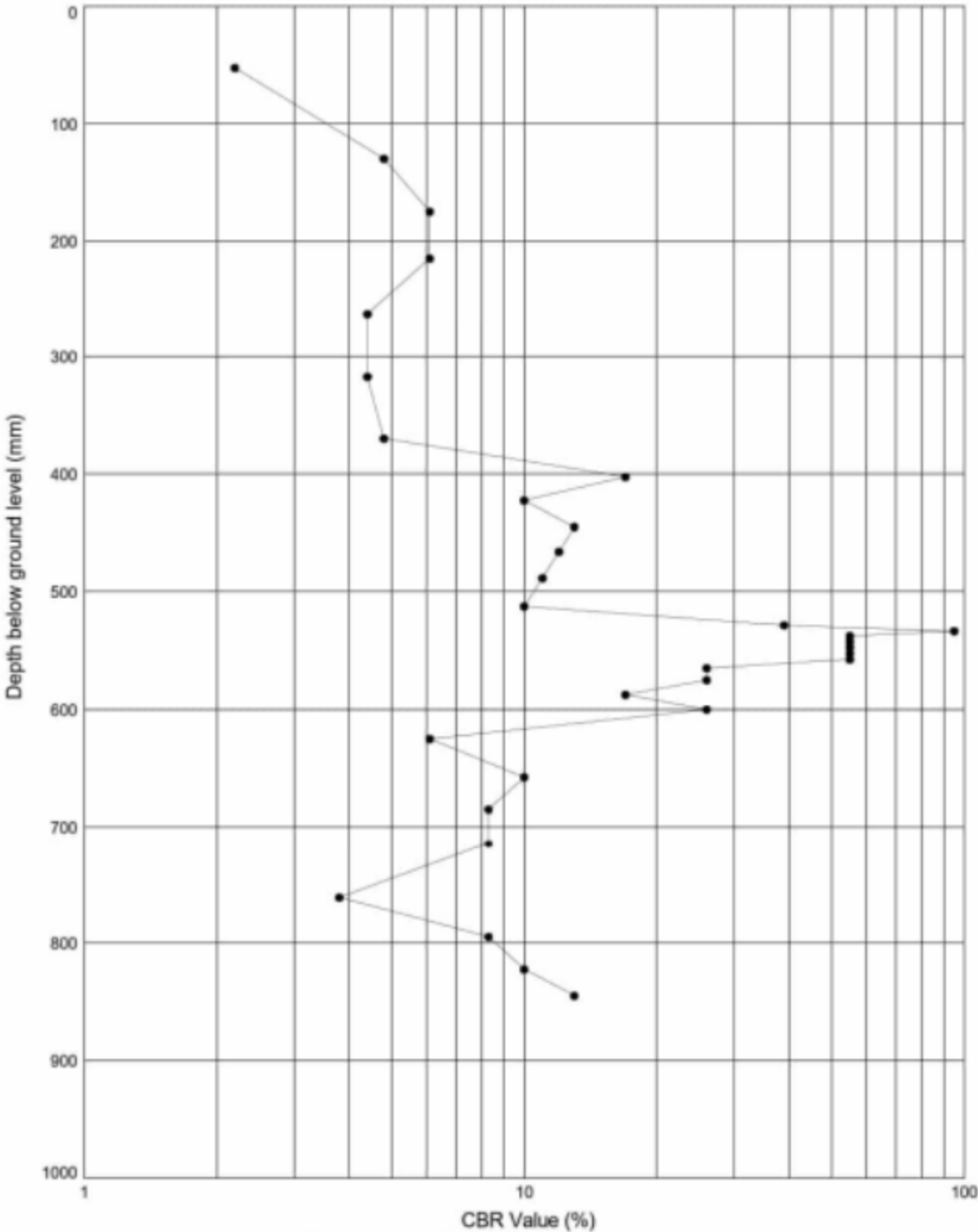
Position Ref : WS1

Test Date : 27.03.23

Test Number : 1

Ground Level: 65.08

National Grid Co-ordinates: E:567056.6 N:171710.6



Notes: CBR values calculated after TRRL Road Note 8 method. Values over 100% are plotted on the 100% line.

Anerley Court
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Kent, TN11 9HU

Contract	Complied By	Date	Checked By	Date
		29/03/23		
Gravesham Leisure Centre			Contract Ref: 52511	

DCP TEST RESULTS - DEPTH vs CBR VALUE

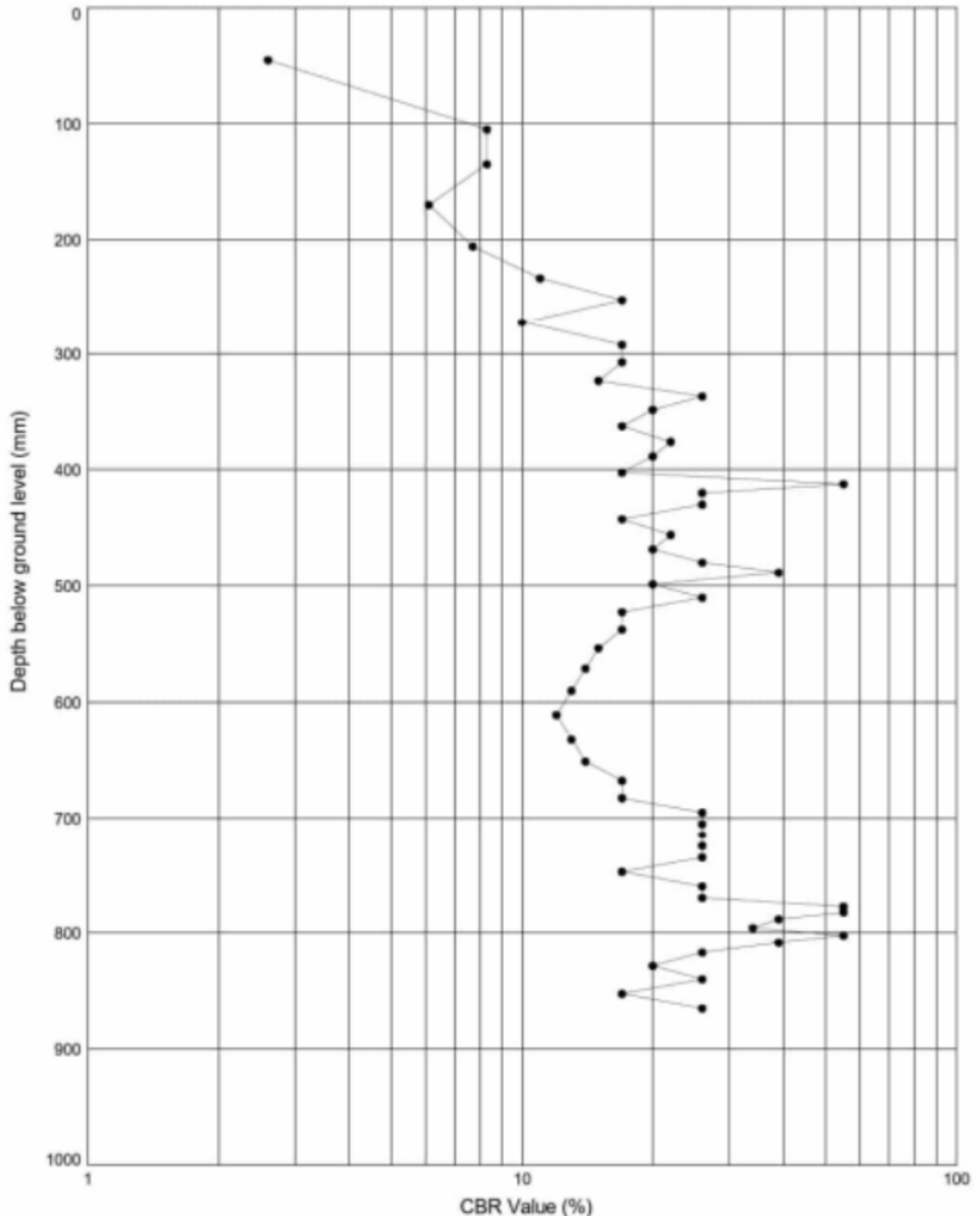
Position Ref : **WS2**

Test Date : **27.03.23**

Test Number : **1**

Ground Level: **65.83**

National Grid Co-ordinates: **E:567119.2 N:171686.2**



Notes: CBR values calculated after TRRL Road Note 8 method. Values over 100% are plotted on the 100% line.

Anerley Court
Half Moon Lane
Hildenborough
Tonbridge
Kent, TN11 9HU

Controlled By	Date	Checked By	Date
[REDACTED]	29/03/23		
Contract	Contract Ref:		
Gravesham Leisure Centre	52511		

DCP TEST RESULTS - DEPTH vs CBR VALUE

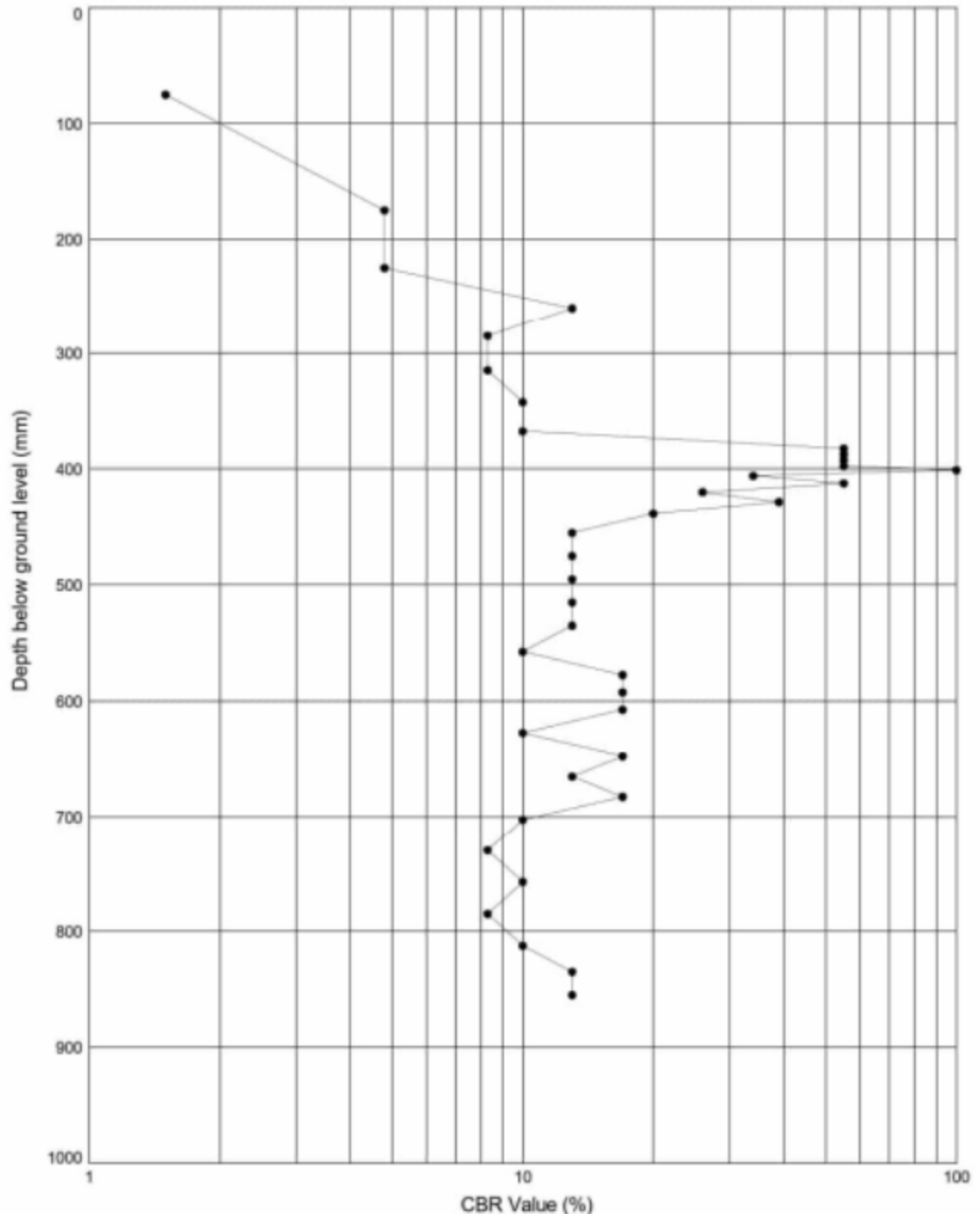
Position Ref : **WS3**

Test Date : **27.03.23**

Test Number : **1**

Ground Level: **66.87**

National Grid Co-ordinates: **E:567138.0 N:171650.0**



Notes: CBR values calculated after TRRL Road Note 8 method. Values over 100% are plotted on the 100% line.

Anerley Court
Half Moon Lane
Hildenborough
Tonbridge
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Compiled By

Date

Checked By

Date

29/03/23

Contract

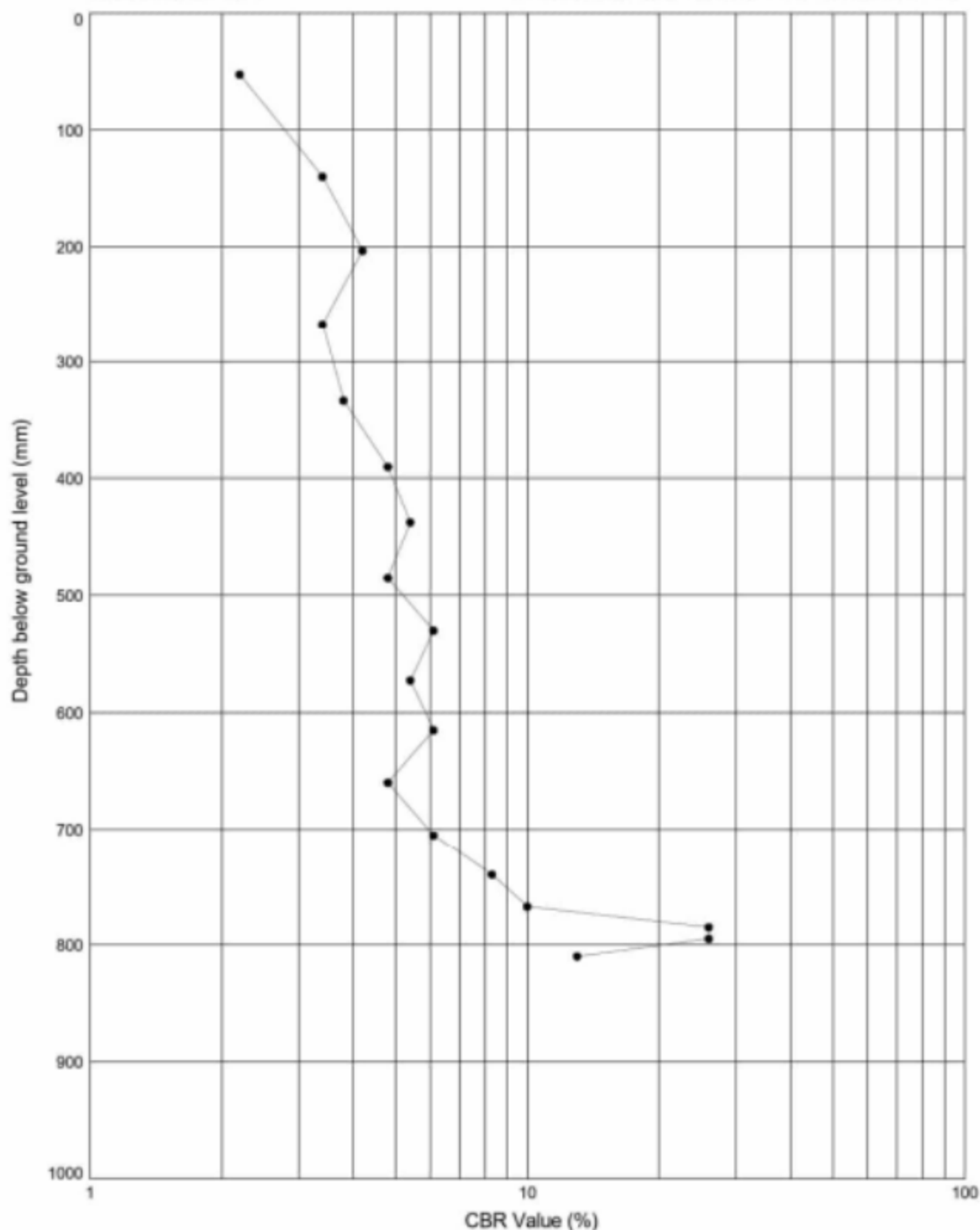
Gravesham Leisure Centre

Contract Ref:

52511

DCP TEST RESULTS - DEPTH vs CBR VALUE

Position Ref : **WS4** Test Date : **27.03.23** Test Number : **1**
Ground Level: **67.27** National Grid Co-ordinates: **E:567047.3 N:171597.0**

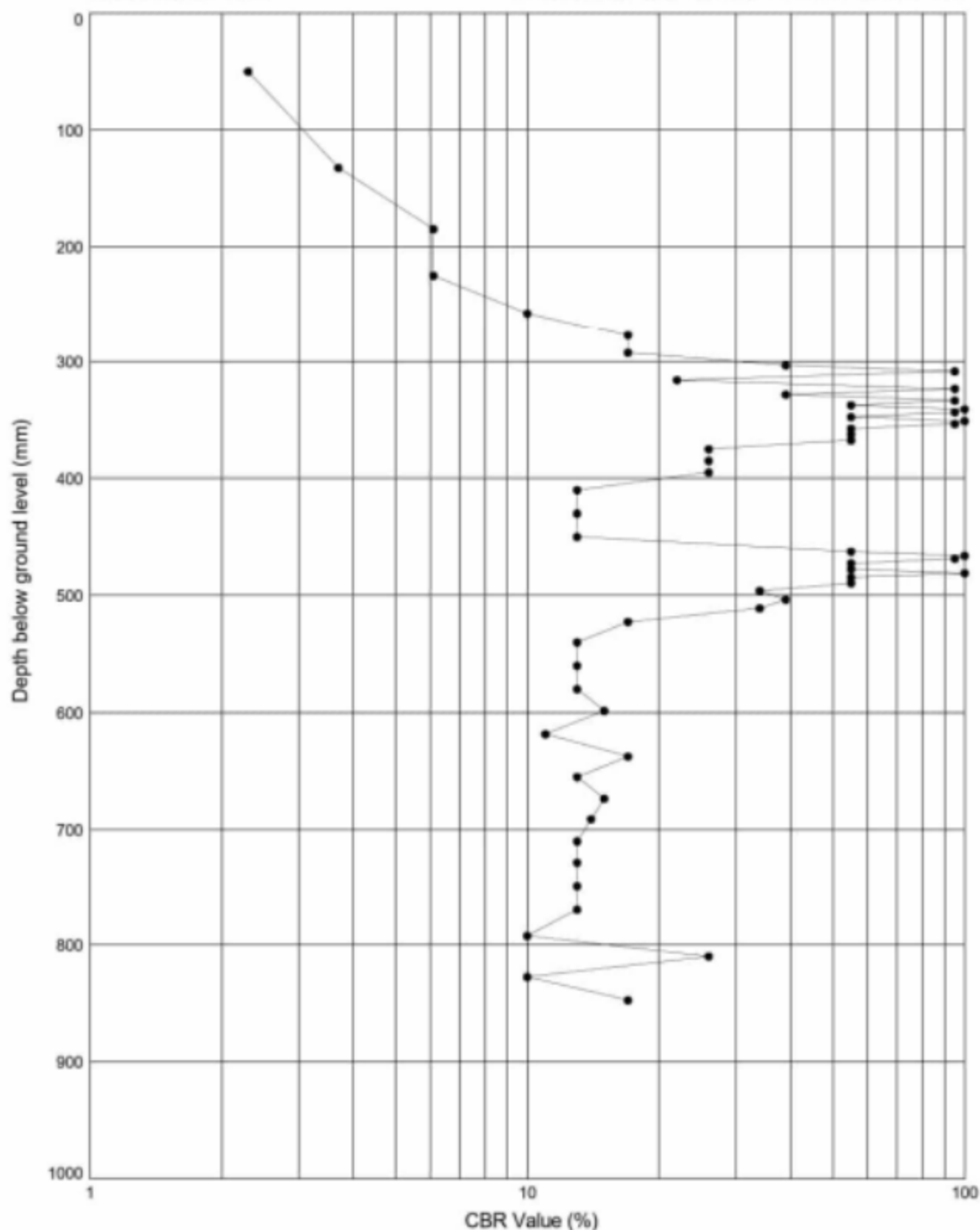


Notes: CBR values calculated after TRRL Road Note 8 method. Values over 100% are plotted on the 100% line.

Anerley Court Half Moon Lane Hildenborough Tonbridge Kent, TN11 9HU	Complied By	Date	Checked By	Date
		29/03/23		
	Contract: Gravesham Leisure Centre		Contract Ref: 52511	

DCP TEST RESULTS - DEPTH vs CBR VALUE

Position Ref : **WS5** Test Date : **27.03.23** Test Number : **1**
Ground Level: **66.49** National Grid Co-ordinates: **E:566961.6 N:171662.6**



Notes: CBR values calculated after TRRL Road Note 8 method. Values over 100% are plotted on the 100% line.

Anerley Court
Half Moon Lane
Hildenborough
Tonbridge
Kent, TN11 9HU

Complied By	Date	Checked By	Date
	29/03/23		
Contract		Contract Ref:	
Gravesham Leisure Centre		52511	

DCP TEST RESULTS - DEPTH vs CBR VALUE

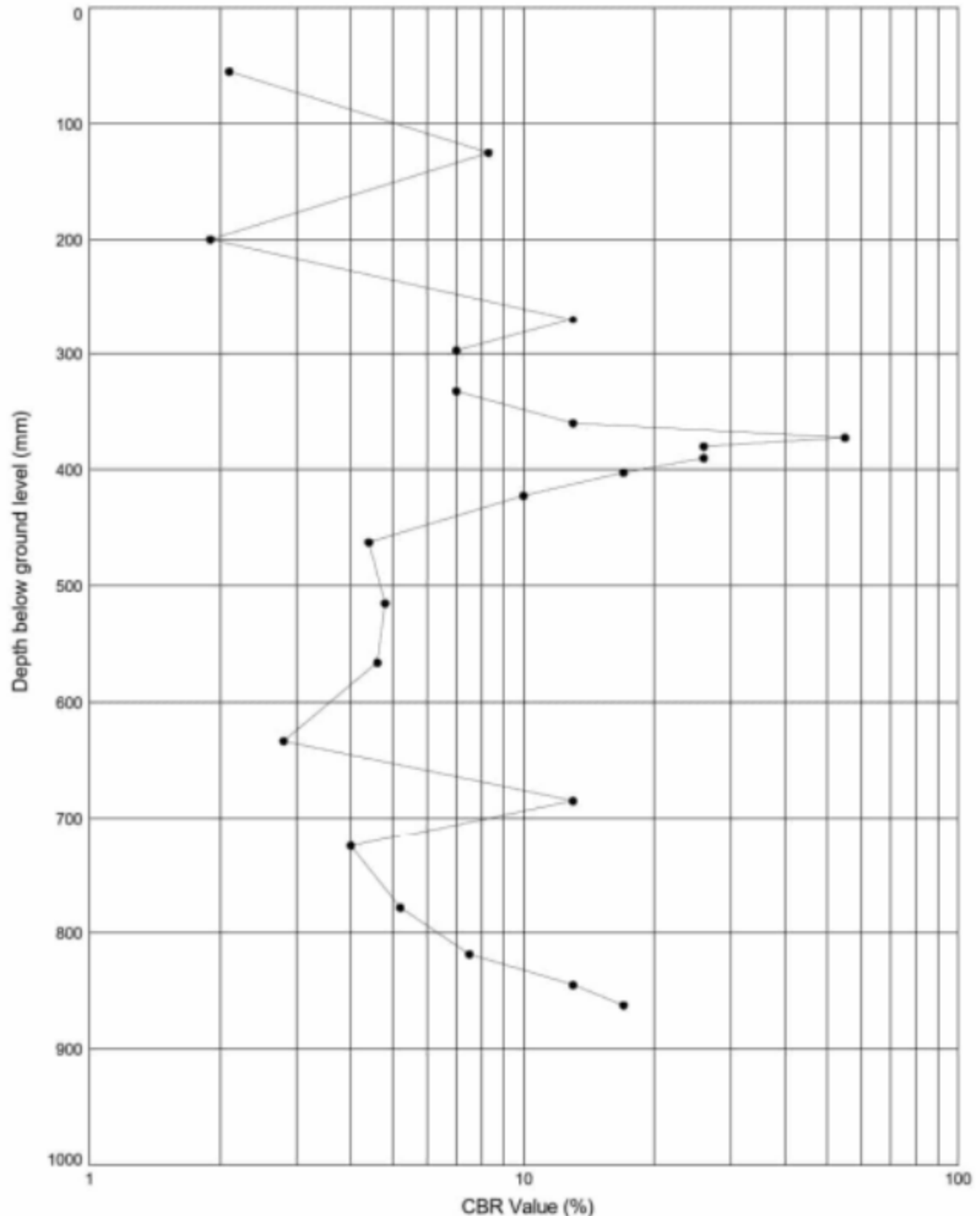
Position Ref : **WS6**

Test Date : **27.03.23**

Test Number : **1**

Ground Level: **65.94**

National Grid Co-ordinates: **E:567013.1 N:171694.6**



Notes: CBR values calculated after TRRL Road Note 8 method. Values over 100% are plotted on the 100% line.

Anerley Court
Half Moon Lane
Hildenborough
Tonbridge
Kent, TN11 9HU

Complied By

Date

Checked By

Date

29/03/23

Contract

Gravesham Leisure Centre

Contract Ref:

52511

FULL SCALE SOAKAWAY TEST

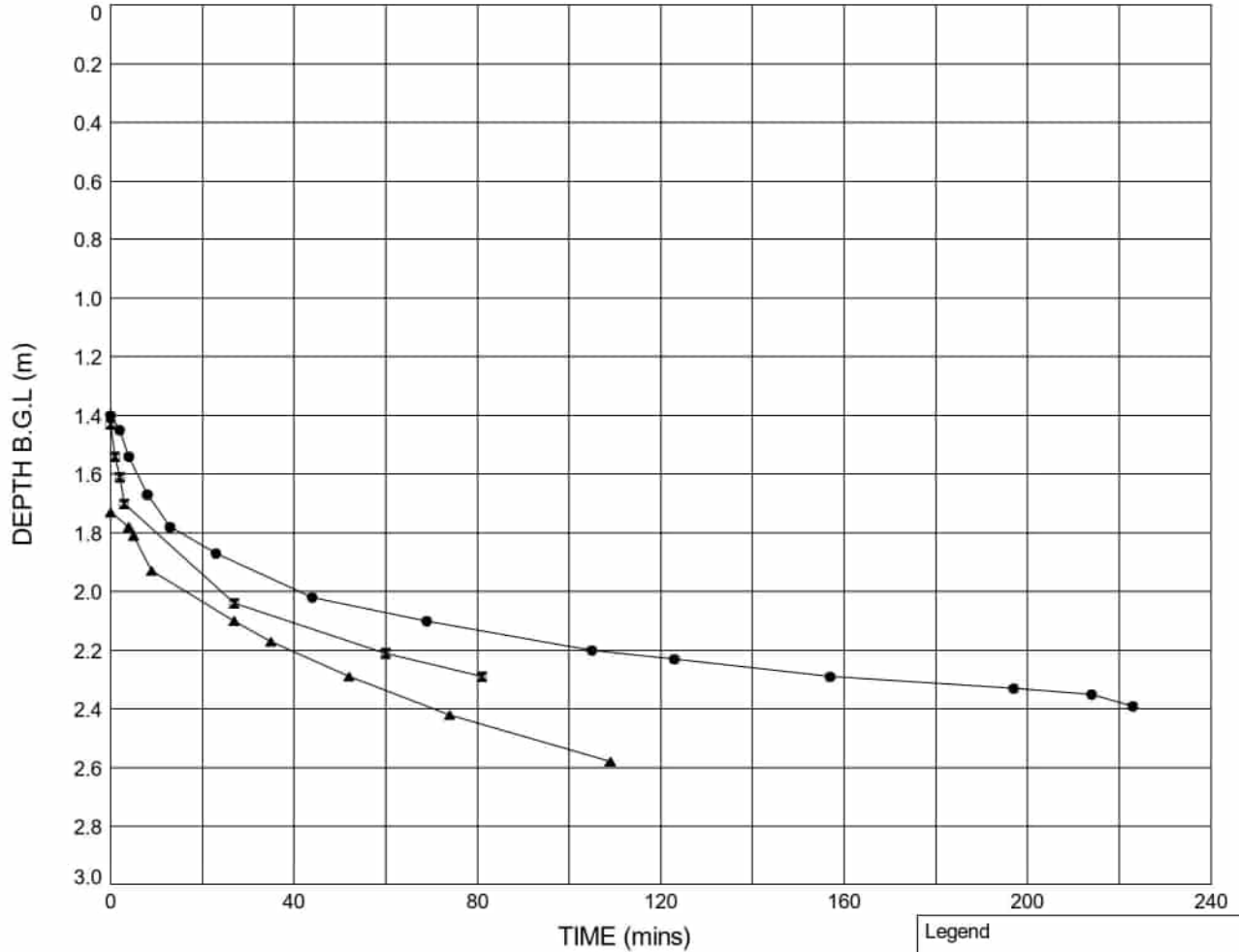
In accordance with BRE Digest 365

Soakaway Test - Position ID : **SA1**

Ground Level: **62.58**

National Grid Co-ordinates: **E:566971.6 N:171797.2**

PLOT OF DEPTH OF WATER BELOW GROUND LEVEL AGAINST TIME



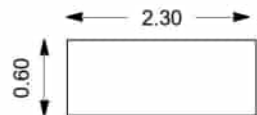
	Test 1	Test 2	Test 3	
Pit start depth:	= 3.00	3.00	3.00	m
Pit final depth:	= 3.00	3.00	2.58	m
Effective depth, D_e	= 1.60	1.57	1.27	m
Effective storage volume, V_{p75-25}	= 1.1040	1.0833	0.8763	m^3
Surface area, a_{s50}	= 6.0200	5.9330	5.0630	m^2
Time, t_{p75-25}	= 15302.0	9162.0	6599.0	secs
Infiltration rate, f	= 1.20×10^{-5}	1.99×10^{-5}	2.62×10^{-5}	m/s

Please note test data was extrapolated to obtain $t_{p75-tp25}$.

Legend

- Test 1 (20.03.23)
- ✕ Test 2 (20.03.23)
- ▲ Test 3 (21.03.23)

Plan (Not to scale)



No Bearing Taken

	Compiled By	Date	Checked By	Date
		06/04/23		
	Contract Gravesham Leisure Centre		Contract Ref: 52511	

FULL SCALE SOAKAWAY TEST

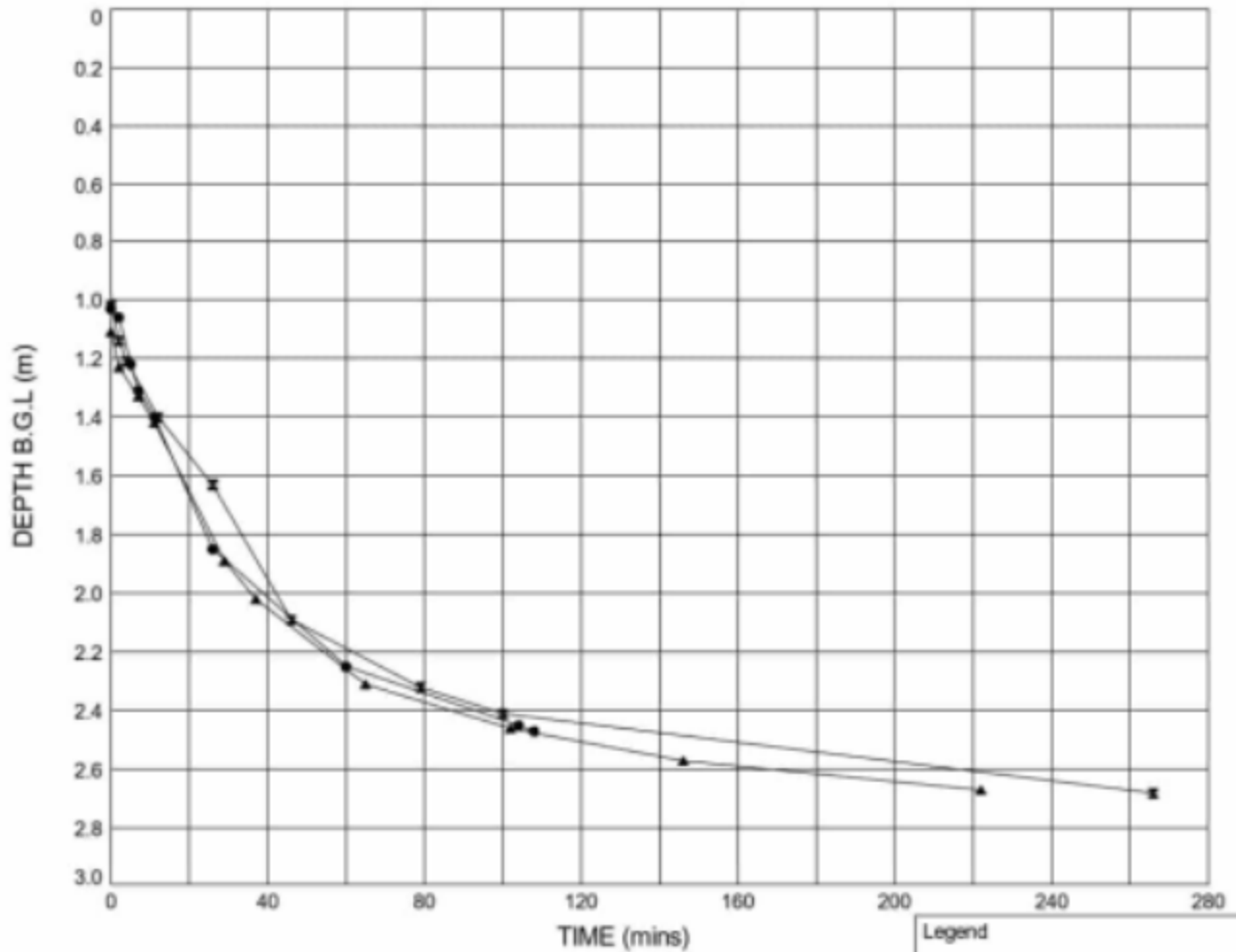
In accordance with BRE Digest 365

Soakaway Test - Position ID : **SA2**

Ground Level: **62.99**

National Grid Co-ordinates: **E:566991.5 N:171748.7**

PLOT OF DEPTH OF WATER BELOW GROUND LEVEL AGAINST TIME



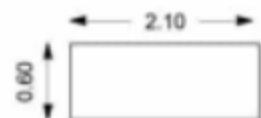
	Test 1	Test 2	Test 3	
Pit start depth:	= 3.00	3.00	3.00	m
Pit final depth:	= 3.00	3.00	2.67	m
Effective depth, D_e	= 1.97	1.98	1.89	m
Effective storage volume, V_{p75-25}	= 1.2411	1.2474	1.1907	m ³
Surface area, a_{s50}	= 6.5790	6.6060	6.3630	m ²
Time, t_{p75-25}	= 6025.0	8364.0	6707.0	secs
Infiltration rate, f	= 3.13×10^{-5}	2.26×10^{-5}	2.79×10^{-5}	m/s

Please note test data was extrapolated to obtain $t_{p75-tp25}$.

Legend

- Test 1 (20.03.23)
- ✕ Test 2 (20.03.23)
- ▲ Test 3 (21.03.23)

Plan (Not to scale)



No Bearing Taken

Complied By

Date

Checked By

Date

06/04/23

Contract

Contract Ref:

Gravesham Leisure Centre

52511

FULL SCALE SOAKAWAY TEST

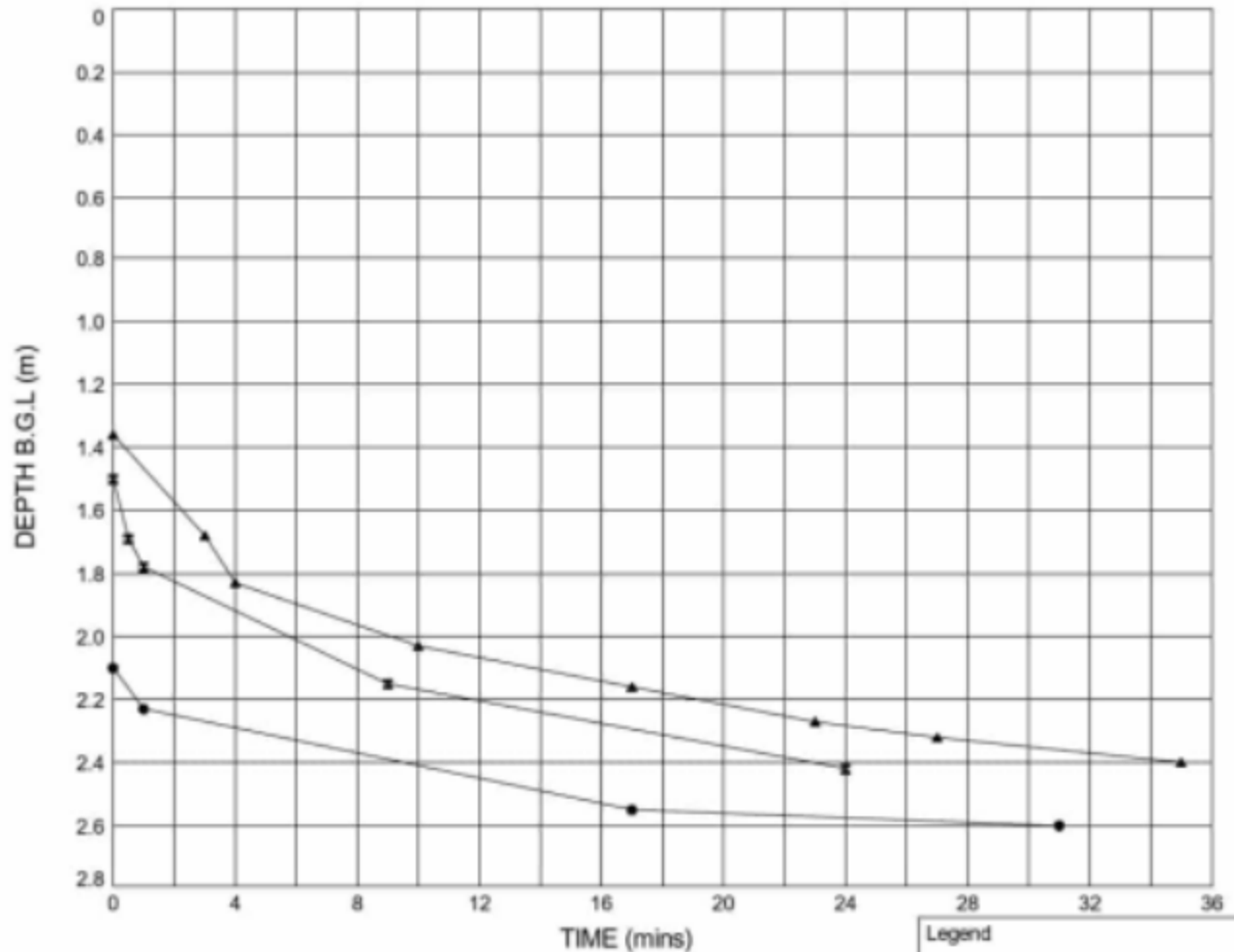
In accordance with BRE Digest 365

Soakaway Test - Position ID : **SA3**

Ground Level: **65.38**

National Grid Co-ordinates: **E:566928.9 N:171729.6**

PLOT OF DEPTH OF WATER BELOW GROUND LEVEL AGAINST TIME



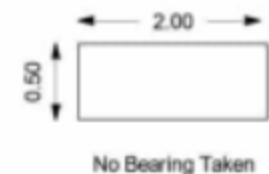
	Test 1	Test 2	Test 3	
Pit start depth:	= 2.80	2.70	2.70	m
Pit final depth:	= 2.60	2.70	2.70	m
Effective depth, D_e	= 0.70	1.20	1.34	m
Effective storage volume, V_{p75-25}	= 0.3500	0.6000	0.6700	m ³
Surface area, a_{s50}	= 2.7500	4.0000	4.3500	m ²
Time, t_{p75-25}	= 2085.0	1287.0	1704.0	secs
Infiltration rate, f	= 6.10×10^{-5}	1.17×10^{-4}	9.04×10^{-5}	m/s

Please note test data was extrapolated to obtain $t_{p75-tp25}$.

Legend

●	Test 1	(21.03.23)
■	Test 2	(21.03.23)
▲	Test 3	(21.03.23)

Plan (Not to scale)



Complied By

Date

Checked By

Date

06/04/23

Contract

Contract Ref:

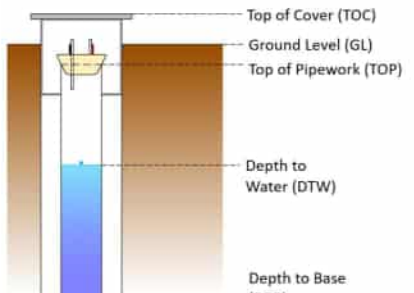
Gravesham Leisure Centre

52511

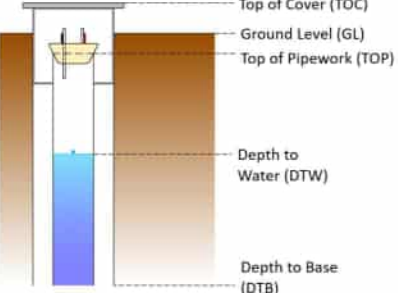
Appendix G

GROUND GAS MONITORING DATA AND SITE CONDITIONS

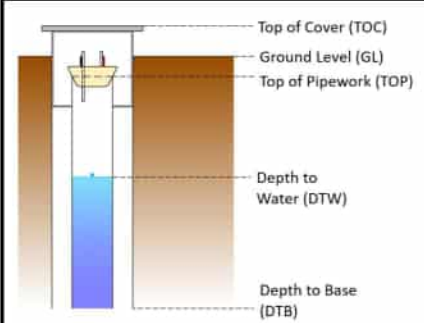
GAS MONITORING FIELD SHEET

Monitoring Date: 14/04/2023		Measurement datum: TOC / GL / TOP / Other		GL		Offset to GL (m):		0	
Pre-Testing Remarks:				Air Temperature: °C		12		Device: GA5000	
				Weather:		Overcast		Serial Number:	
				Ground Conditions:		Wet		Daily Check:	
				Wind: NONE / LIGHT / MEDIUM / STRONG		Light			
				Tidal State: (if applicable) High / Low / Rising / Falling		N/A			
Exploratory Position ID:		WS6		Monitoring Round Number:		3		Test Number:	
Install Type: SINGLE / DOUBLE				Pipe Ref: 1) Shallow 2) Deep				Pipe Diameter: 19mm / 40mm / 50mm / Other (mm)	
Time of Monitoring (hh:mm)	Flow readings	Gas readings	Atmospheric Pressure (mb)	Differential Pressure (mb)	Gas tap: SINGLE / DOUBLE				
Time Start (hh:mm)	11:36	11:33	998	0.02	Observations (e.g. on-site activities):				
Time End (hh:mm)									
Stage 1 Flow Readings	Stage 1 Flow Readings	Stage 2 Gas Monitoring:	Methane (%/vol)	Carbon Dioxide (%/vol)	Oxygen (%/vol)	Carbon monoxide (ppm)	Hydrogen sulphide (ppm)	LEL (%)	PID (ppm)
Time of flow monitoring (sec)	Flow Reading (l/hr)	Time of gas monitoring (sec)							
0	0	0	0	0.1	21.5	0	0		0.8
5	0	15	0	1	20.3	0	0		0.2
10	0	30	0	1.1	19.9	0	0		0.1
15	0	60	0	1.2	19.7	0	0		
20	0	90	0	1.3	19.5	0	0		
25	0.1	120	0	1.5	19.3	0	0		
30	0.1	180	0	1.4	19.5	0	0		
40	0.1	240							
50	0.1	300							
60	0.1	360							
90		420							
120		480							
150		540							
180		600							
Stage 1 gas flow - Peak (l/h)			Note: Flow should be recorded at 5 second intervals up to 30 seconds, 10 second intervals to 2 minutes and 30 second intervals up to 3 minutes or until steady-state readings are obtained. Typically, steady state conditions occur within 30 seconds to a minute. The differential pressure reading (in Pa) should also be recorded during this period.						
Stage 1 gas flow - Steady State (l/h)									
STAGE 3 WATER LEVEL OBSERVATION		Depth (from datum) to water (DTW): (m)		dry		Time:		LNAPL Top (from datum) (m):	
		Depth (from datum) to well base (DTB): (m)		4.04		Purge Start:		DNAPL Top (from datum) (m):	
		Hole Purged: Yes / No				Purge End:		Water Observations:	
		Purge Volume (m³)				Post-Purge (DTW) (m)			
				Post testing remarks:		Samples Taken: Yes / No			
						Sample Media: Gas/Water			
						Gas Cannister Start (mb)			
						Gas Cannister End (mb)			
						Gas Cannister Duration (mins)			
						Depth (from datum)	Sample Ref	Type (EW / G)	Container
		Contract Name:		Gravesham Leisure Centre		Data Collected By:		JC	
		Project Manager / Engineer:		JC		Checked:			
		Contract Ref:		52511		Page number:			

GAS MONITORING FIELD SHEET

Monitoring Date: 06/04/2023		Measurement datum: TOC / GL / TOP / Other		GL		Offset to GL (m):		0	
Pre-Testing Remarks:				Air Temperature: °C		10		Device: GA5000	
				Weather:		Overcast		Serial Number:	
				Ground Conditions:		Wet		Daily Check:	
				Wind: NONE / LIGHT / MEDIUM / STRONG		Light			
				Tidal State: (if applicable) High / Low / Rising / Falling		N/A			
Exploratory Position ID:		WS6		Monitoring Round Number:		2		Test Number:	
Install Type: SINGLE / DOUBLE				Pipe Ref: 1) Shallow 2) Deep				Pipe Diameter: 19mm / 40mm / 50mm / Other (mm)	
Time of Monitoring (hh:mm)	Flow readings	Gas readings	Atmospheric Pressure (mb)	Differential Pressure (mb)	Gas tap: SINGLE / DOUBLE				
Time Start (hh:mm)	11:54	11:49	1006	0.02	Observations (e.g. on-site activities):				
Time End (hh:mm)									
Stage 1 Flow Readings	Stage 1 Flow Readings	Stage 2 Gas Monitoring:	Methane (%/vol)	Carbon Dioxide (%/vol)	Oxygen (%/vol)	Carbon monoxide (ppm)	Hydrogen sulphide (ppm)	LEL (%)	PID (ppm)
Time of flow monitoring (sec)	Flow Reading (l/hr)	Time of gas monitoring (sec)							
0	0	0	0	0.2	21.2	0	0		0.7
5	0.1	15	0	2.2	19.6	0	0		0.2
10	0.1	30	0	2.3	19	0	0		0.2
15	0.1	60	0	2.2	19.2	0	0		
20	0.1	90	0	2	19.6	0	0		
25	0.1	120	0	1.8	20.1	0	0		
30	0.1	180	0	1.7	20.4	0	0		
40	0.1	240	0	1.5	20.6	0	0		
50	0.1	300							
60	0.1	360							
90		420							
120		480							
150		540							
180		600							
Stage 1 gas flow - Peak (l/h)	0.1		Note: Flow should be recorded at 5 second intervals up to 30 seconds, 10 second intervals to 2 minutes and 30 second intervals up to 3 minutes or until steady-state readings are obtained. Typically, steady state conditions occur within 30 seconds to a minute. The differential pressure reading (in Pa) should also be recorded during this period.						
Stage 1 gas flow - Steady State (l/h)	0.1								
STAGE 3 WATER LEVEL OBSERVATION	Depth (from datum) to water (DTW): (m)		Dry	Time:		LNAPL Top (from datum) (m):			
	Depth (from datum) to well base (DTB): (m)		4.03	Purge Start:		DNAPL Top (from datum) (m):			
	Hole Purged: Yes / No			Purge End:		Water Observations:			
	Purge Volume (m³)			Post-Purge (DTW) (m)					
			Post testing remarks:		Samples Taken: Yes / No				
					Sample Media: Gas/Water				
					Gas Cannister Start (mb)				
					Gas Cannister End (mb)				
					Gas Cannister Duration (mins)				
Depth (from datum)		Sample Ref	Type (EW / G)	Container					
		Contract Name:		Gravesham Leisure Centre		Data Collected By:		JC	
		Project Manager / Engineer:		JC		Checked:			
		Contract Ref:		52511		Page number:			

GAS MONITORING FIELD SHEET

Monitoring Date:	31/03/2023	Measurement datum: TOC / GL / TOP / Other	GL	Offset to: GL (m):	0				
Pre-Testing Remarks:			Air Temperature: °C	12	Device:	GA5000			
			Weather:	Rain	Serial Number:				
			Ground Conditions:	Wet	Daily Check:				
			Wind: NONE / LIGHT / MEDIUM / STRONG		Light				
			Tidal State: (if applicable) High / Low / Rising / Falling		N/A				
Exploratory Position ID:		WS6	Monitoring Round Number:	1	Test Number:				
Install Type: SINGLE / DOUBLE			Pipe Ref: 1) Shallow 2) Deep		Pipe Diameter: 19mm/ 40mm / 50mm / Other (mm)				
Time of Monitoring (hh:mm)	Flow readings	Gas readings	Atmospheric Pressure (mb)	Differential Pressure (mb)	Gas tap: SINGLE / DOUBLE				
Time Start (hh:mm)	12:40	12:36	979	0.11	Observations (e.g. on-site activities):				
Time End (hh:mm)									
Stage 1 Flow Readings	Stage 1 Flow Readings	Stage 2 Gas Monitoring:	Methane (%/vol)	Carbon Dioxide (%/vol)	Oxygen (%/vol)	Carbon monoxide (ppm)	Hydrogen sulphide (ppm)	LEL (%)	PID (ppm)
Time of flow monitoring (sec)	Flow Reading (l/hr)	Time of gas monitoring (sec)							
0	0	0	0	0.2	21.7	0	0		1
5	0.1	15	0	2	19.9	0	0		0.3
10	0.1	30	0	2	19.5	0	0		0.2
15	0.1	60	0	2.1	19.5	0	0		
20	0.1	90	0	2.1	19.7	0	0		
25	0.1	120	0	2	20	0	0		
30	0.1	180	0	1.9	20.1	0	0		
40	0.1	240							
50	0.1	300							
60	0.1	360							
90		420							
120		480							
150		540							
180		600							
Stage 1 gas flow - Peak (l/h)	0.1		Note: Flow should be recorded at 5 second intervals up to 30 seconds, 10 second intervals to 2 minutes and 30 second intervals up to 3 minutes or until steady-state readings are obtained. Typically, steady state conditions occur within 30 seconds to a minute. The differential pressure reading (in Pa) should also be recorded during this period.						
Stage 1 gas flow - Steady State (l/h)	0.1								
STAGE 3 WATER LEVEL OBSERVATION	Depth (from datum) to water (DTW): (m)		Dry	Time:	LNAPL Top (from datum) (m):				
	Depth (from datum) to well base (DTB): (m)		4.03	Purge Start:	DNAPL Top (from datum) (m):				
	Hole Purged: Yes / No			Purge End:	Water Observations:				
	Purge Volume: (l/m)			Post-Purge (DTW) (m)					
			Post testing remarks:	Samples Taken: Yes / No					
			Sample Media: Gas/Water						
			Gas Cannister Start (mb)						
			Gas Cannister End (mb)						
			Gas Cannister Duration (mins)						
			Depth (from datum)	Sample Ref	Type (EW / G)	Container			
Contract Name:		Gravesham Leisure Centre		Data Collected By:		JC			
Project Manager / Engineer:		JC		Checked:					
Contract Ref:		52511		Page number:					



TPF210 Issue 6

Appendix H

LABORATORY CERTIFICATES FOR SOIL ANALYSIS

Final Test Report

Envirolab Job Number:	23/02978	
Issue Number:	1	Date: 12-Apr-23
Client:	RSK Environment Ltd Tonbridge Anerley Court, Half Moon Lane, Hildenborough Tonbridge Kent TN11 9HU Surrey, RH4 3HW	
Project Manager:	Josh Curnow/Niki Dubber	
Project Name:	Gravesham Leisure Centre	
Project Ref:	52511	
Order No:	N/A	
Date Samples Received:	23-Mar-23	
Date Instructions Received:	29-Mar-23	
Date Analysis Completed:	12-Apr-23	

Notes - Soil analysis

All results are reported as dry weight ($\approx 40^{\circ}\text{C}$).

For samples with Matrix Codes 1 - 6 natural stones $>10\text{mm}$ are removed or excluded from the sample prior to analysis and reported results corrected to a whole sample basis.

For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis.

Notes - General

This report shall not be reproduced, except in full, without written approval from Envirolab.

Subscript "A" indicates analysis performed on the sample as received, "D" indicates analysis performed on the dried sample, crushed to pass a 2mm sieve, unless asbestos is found to be present in which case all analysis is performed on the sample as received.

All analysis is performed on the dried and crushed sample for samples with Matrix Code 7 and this supercedes any "A" subscripts.

All analysis is performed on the sample as received for soil samples from outside the European Union and this supercedes any "D" subscripts.

For complex, multi-compound analysis, quality control results do not always fall within chart limits for every compound and we have criteria for reporting in these situations.

If results are in *italic* font they are associated with such quality control failures and may be unreliable.

A deviating samples report is appended and will indicate if samples or tests have been found to be deviating. Any test results affected may not be an accurate record of the concentration at the time of sampling and, as a result, may be invalid.

Predominant Matrix Codes: 1 = SAND, 2 = LOAM, 3 = CLAY, 4 = LOAM/SAND, 5 = SAND/CLAY, 6 = CLAY/LOAM, 7 = OTHER, 8 = Asbestos bulk ID sample

Secondary Matrix Codes: A = contains stones, B = contains construction rubble, C = contains volatile hydrocarbons, D = contains glass/metal, E = contains roots/weeds.

IS indicates insufficient sample for analysis, NDP indicates No Determination Possible and NAD indicates No Asbestos Detected.

Analytical results reflect the quality of the sample at the time of analysis only. Opinions and interpretations expressed are outside the scope of our accreditation.

Please contact us if you need any further information.

HWOL TPH CODE: 5H_CU_TU_AL: extractable hydrocarbons - i.e. everything extracted by the solvent(s), clean-up - e.g. by toluene, silica gel, ULC - large oil gas chromatography. Asphatics only

Approved by:



Danielle Brierley
Deputy Client Services Supervisor

Sample Details					Landfill Waste Acceptance Criteria Limits			
Lab Sample ID	Method	ISO17025	MCERTS	23/02978/8				
Client Sample Number					Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill	
Client Sample ID				SA1				
Depth to Top				0				
Depth to Bottom				0.20				
Date Sampled				20/03/2023				
Sample Type				Soil - ES				
Sample Matrix Code				4ABE				
Solid Waste Analysis								
pH (pH Units) _D	A-T-031	N	N	8.64	-	>6	-	
ANC to pH 4 (mol/kg) _D	A-T-ANC	N	N	0.67	-	to be evaluated	to be evaluated	
ANC to pH 6 (mol/kg) _D	A-T-ANC	N	N	0.19	-	to be evaluated	to be evaluated	
Loss on Ignition (%) _D	A-T-030	N	N	9.9	-	-	10	
Total Organic Carbon (%) _D	A-T-032	N	N	11.4	3	5	6	
PAH Sum of 17 (mg/kg) _A	A-T-019	N	N	40.2	100	-	-	
Mineral Oil (mg/kg) _A EH, CU, 10, AL	A-T-007	N	N	64	500	-	-	
Sum of 7 PCBs (mg/kg) _A	A-T-004	N	N	0.036	1	-	-	
Sum of BTEX (mg/kg) _A	A-T-022	N	N	<0.01	6	-	-	
Eluate Analysis				10:1 mg/l	10:1 mg/kg	Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg (mg/kg)		
Arsenic	A-T-025	N	N	0.002	0.020	0.5	25	
Barium	A-T-025	N	N	0.108	1.080	20	300	
Cadmium	A-T-025	N	N	<0.001	<0.01	0.04	5	
Chromium	A-T-025	N	N	0.002	0.020	0.5	70	
Copper	A-T-025	N	N	0.006	0.060	2	100	
Mercury	A-T-025	N	N	<0.0005	<0.005	0.01	2	
Molybdenum	A-T-025	N	N	0.002	0.020	0.5	30	
Nickel	A-T-025	N	N	<0.002	<0.02	0.4	40	
Lead	A-T-025	N	N	0.005	0.050	0.5	50	
Antimony	A-T-025	N	N	<0.001	<0.01	0.06	5	
Selenium	A-T-025	N	N	<0.001	<0.01	0.1	7	
Zinc	A-T-025	N	N	0.009	0.090	4	200	
Chloride	A-T-026	N	N	7	65	800	15000	
Fluoride	A-T-026	N	N	0.1	1.0	10	150	
Sulphate as SO ₄	A-T-026	N	N	8	77	1000	20000	
Total Dissolved Solids	A-T-035	N	N	62	620	4000	60000	
Phenol Index	A-T-050	N	N	0.01	0.10	1	-	
Dissolved Organic Carbon	A-T-032	N	N	<2.0	<200	500	800	
Leach Test Information								
pH (pH Units)	A-T-031	N	N	8.0				
Conductivity (µS/cm)	A-T-037	N	N	125				
Mass Sample (kg)				0.201				
Dry Matter (%)	A-T-044	N	N	86.9				
Stated acceptance limits are for guidance only and Envirolab cannot be held responsible for any discrepancies with current legislation								

Sample Details					Landfill Waste Acceptance Criteria Limits			
Lab Sample ID	Method	ISO17025	MCERTS	23/02978/10				
Client Sample Number					Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill	
Client Sample ID				SA2				
Depth to Top				0.2				
Depth to Bottom				0.40				
Date Sampled				20/03/2023				
Sample Type				Soil - ES				
Sample Matrix Code				4ABE				
Solid Waste Analysis								
pH (pH Units) _D	A-T-031	N	N	8.59	-	>6	-	
ANC to pH 4 (mol/kg) _D	A-T-ANC	N	N	0.55	-	to be evaluated	to be evaluated	
ANC to pH 6 (mol/kg) _D	A-T-ANC	N	N	0.19	-	to be evaluated	to be evaluated	
Loss on Ignition (%) _D	A-T-030	N	N	5.7	-	-	10	
Total Organic Carbon (%) _D	A-T-032	N	N	3.68	3	5	6	
PAH Sum of 17 (mg/kg) _A	A-T-019	N	N	124	100	-	-	
Mineral Oil (mg/kg) _{A, EH, CU, 1D, AL}	A-T-007	N	N	268	500	-	-	
Sum of 7 PCBs (mg/kg) _A	A-T-004	N	N	<0.007	1	-	-	
Sum of BTEX (mg/kg) _A	A-T-022	N	N	<0.01	6	-	-	
Eluate Analysis				10:1 mg/l	10:1 mg/kg	Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg (mg/kg)		
Arsenic	A-T-025	N	N	0.006	0.060	0.5	2	25
Barium	A-T-025	N	N	0.098	0.980	20	100	300
Cadmium	A-T-025	N	N	<0.001	<0.01	0.04	1	5
Chromium	A-T-025	N	N	0.009	0.090	0.5	10	70
Copper	A-T-025	N	N	0.009	0.090	2	50	100
Mercury	A-T-025	N	N	<0.0005	<0.005	0.01	0.2	2
Molybdenum	A-T-025	N	N	0.002	0.020	0.5	10	30
Nickel	A-T-025	N	N	<0.002	<0.02	0.4	10	40
Lead	A-T-025	N	N	0.019	0.190	0.5	10	50
Antimony	A-T-025	N	N	0.002	0.020	0.06	0.7	5
Selenium	A-T-025	N	N	<0.001	<0.01	0.1	0.5	7
Zinc	A-T-025	N	N	0.014	0.140	4	50	200
Chloride	A-T-026	N	N	<1.00	<10	800	15000	25000
Fluoride	A-T-026	N	N	0.3	3.0	10	150	500
Sulphate as SO ₄	A-T-026	N	N	<1.00	<10	1000	20000	50000
Total Dissolved Solids	A-T-035	N	N	46	460	4000	60000	100000
Phenol Index	A-T-050	N	N	<0.01	<0.1	1	-	-
Dissolved Organic Carbon	A-T-032	N	N	<2.0	<200	500	800	1000
Leach Test Information								
pH (pH Units)	A-T-031	N	N	8.0				
Conductivity (µS/cm)	A-T-037	N	N	92				
Mass Sample (kg)				0.197				
Dry Matter (%)	A-T-044	N	N	89				
Stated acceptance limits are for guidance only and Envirolab cannot be held responsible for any discrepancies with current legislation								

FINAL ANALYTICAL TEST REPORT

Envirolab Job Number: 23/02978
Issue Number: 1
Date: 12 April, 2023

Client: RSK Environment Ltd Tonbridge
Anerley Court, Half Moon Lane, Hildenborough
Tonbridge
Kent
TN11 9HU

Project Manager: Josh Curnow/Niki Dubber
Project Name: Gravesham Leisure Centre
Project Ref: 52511
Order No: N/A
Date Samples Received: 23/03/23
Date Instructions Received: 29/03/23
Date Analysis Completed: 12/04/23

Approved by:



Danielle Brierley
Deputy Client Services Supervisor

Envirolab Job Number: 23/02978

Client Project Name: Gravesham Leisure Centre

Client Project Ref: 52511

Lab Sample ID	23/02978/1	23/02978/2	23/02978/3	23/02978/4	23/02978/5	23/02978/6	23/02978/7	Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	BH1	WS1	WS2	WS3	WS4	WS5	WS6			
Depth to Top	0.05	0.00	0.00	0.00	0.00	0.10	0.00			
Depth To Bottom		0.30	0.30	0.30	0.30	0.40	0.30			
Date Sampled	17-Mar-23	16-Mar-23	16-Feb-23	16-Mar-24	16-Feb-24	16-Mar-25	16-Feb-25			
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES			
Sample Matrix Code	4AB	4AE	4AE	4AE	4AE	4AE	4AE			
% Stones >10mm _A	6.4	<0.1	<0.1	<0.1	<0.1	<0.1	5.6	% w/w	0.1	A-T-044
pH _D ^{MS}	9.49	8.19	7.86	8.09	6.07	8.02	8.10	pH	0.01	A-T-031a
Sulphate (water sol 2:1) _D ^{MS}	0.06	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	g/l	0.01	A-T-026a
Sulphate (acid soluble) _D ^{MS}	<1000	490	850	370	620	310	650	mg/kg	200	A-T-028a
Total Organic Carbon _D ^{MS}	-	1.77	-	1.69	-	-	2.92	% w/w	0.03	A-T-032a
Arsenic _D ^{MS}	<1	9	7	2	5	10	6	mg/kg	1	A-T-024a
Cadmium _D ^{MS}	0.7	1.7	1.0	0.9	1.1	0.7	13.4	mg/kg	0.5	A-T-024a
Copper _D ^{MS}	7	40	20	16	17	17	51	mg/kg	1	A-T-024a
Chromium _D ^{MS}	10	26	32	34	35	19	41	mg/kg	1	A-T-024a
Chromium (hexavalent) _D	<1	-	-	-	-	<1	-	mg/kg	1	A-T-040a
Lead _D ^{MS}	3	34	60	48	39	47	48	mg/kg	1	A-T-024a
Mercury _D	1.75	<0.17	<0.17	<0.17	<0.17	<0.17	0.67	mg/kg	0.17	A-T-024a
Nickel _D ^{MS}	4	28	21	17	25	11	33	mg/kg	1	A-T-024a
Selenium _D ^{MS}	<1	<1	<1	<1	<1	<1	<1	mg/kg	1	A-T-024a
Zinc _D ^{MS}	36	76	88	97	93	71	146	mg/kg	5	A-T-024a

Envirolab Job Number: 23/02978

Client Project Name: Gravesham Leisure Centre

Client Project Ref: 52511

Lab Sample ID	23/02978/1	23/02978/2	23/02978/3	23/02978/4	23/02978/5	23/02978/6	23/02978/7	Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	BH1	WS1	WS2	WS3	WS4	WS5	WS6			
Depth to Top	0.05	0.00	0.00	0.00	0.00	0.10	0.00			
Depth To Bottom		0.30	0.30	0.30	0.30	0.40	0.30			
Date Sampled	17-Mar-23	16-Mar-23	16-Feb-23	16-Mar-24	16-Feb-24	16-Mar-25	16-Feb-25			
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES			
Sample Matrix Code	4AB	4AE	4AE	4AE	4AE	4AE	4AE			
Asbestos in Soil (inc. matrix) ^										
Asbestos in soil _D [#]	NAD	NAD	NAD	NAD	NAD	NAD	NAD			A-T-045
Asbestos Matrix (visual) _D	-	-	-	-	-	-	-			A-T-045
Asbestos Matrix (microscope) _D	-	-	-	-	-	-	-			A-T-045
Asbestos ACM - Suitable for Water Absorption Test? _D	N/A	N/A	N/A	N/A	N/A	N/A	N/A			A-T-045

Envirolab Job Number: 23/02978

Client Project Name: Gravesham Leisure Centre

Client Project Ref: 52511

Lab Sample ID	23/02978/1	23/02978/2	23/02978/3	23/02978/4	23/02978/5	23/02978/6	23/02978/7	Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	BH1	WS1	WS2	WS3	WS4	WS5	WS6			
Depth to Top	0.05	0.00	0.00	0.00	0.00	0.10	0.00			
Depth To Bottom		0.30	0.30	0.30	0.30	0.40	0.30			
Date Sampled	17-Mar-23	16-Mar-23	16-Feb-23	16-Mar-24	16-Feb-24	16-Mar-25	16-Feb-25			
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES			
Sample Matrix Code	4AB	4AE	4AE	4AE	4AE	4AE	4AE			
PAH-16MS										
Acenaphthene _A ^{MS}	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	0.02	mg/kg	0.01	A-T-019s
Acenaphthylene _A ^{MS}	<0.01	0.01	<0.01	<0.01	<0.01	0.04	<0.01	mg/kg	0.01	A-T-019s
Anthracene _A ^{MS}	<0.02	<0.02	<0.02	<0.02	<0.02	0.06	0.04	mg/kg	0.02	A-T-019s
Benzo(a)anthracene _A ^{MS}	<0.04	0.14	0.12	0.11	0.05	0.39	0.25	mg/kg	0.04	A-T-019s
Benzo(a)pyrene _A ^{MS}	<0.04	0.18	0.14	0.12	0.06	0.39	0.24	mg/kg	0.04	A-T-019s
Benzo(b)fluoranthene _A ^{MS}	<0.05	0.23	0.19	0.17	0.09	0.51	0.36	mg/kg	0.05	A-T-019s
Benzo(ghi)perylene _A ^{MS}	0.06	0.16	0.10	0.09	<0.05	0.24	0.14	mg/kg	0.05	A-T-019s
Benzo(k)fluoranthene _A ^{MS}	<0.07	<0.07	<0.07	<0.07	<0.07	0.19	0.12	mg/kg	0.07	A-T-019s
Chrysene _A ^{MS}	<0.06	0.17	0.16	0.15	0.08	0.46	0.36	mg/kg	0.06	A-T-019s
Dibenzo(ah)anthracene _A ^{MS}	<0.04	<0.04	<0.04	<0.04	<0.04	0.05	<0.04	mg/kg	0.04	A-T-019s
Fluoranthene _A ^{MS}	<0.08	0.26	0.30	0.26	0.14	0.89	0.78	mg/kg	0.08	A-T-019s
Fluorene _A ^{MS}	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	0.01	mg/kg	0.01	A-T-019s
Indeno(123-cd)pyrene _A ^{MS}	<0.03	0.16	0.10	0.10	0.04	0.26	0.14	mg/kg	0.03	A-T-019s
Naphthalene _A ^{MS}	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	mg/kg	0.03	A-T-019s
Phenanthrene _A ^{MS}	<0.03	0.07	0.11	0.09	0.05	0.32	0.39	mg/kg	0.03	A-T-019s
Pyrene _A ^{MS}	<0.07	0.25	0.26	0.22	0.13	0.76	0.66	mg/kg	0.07	A-T-019s
Total PAH-16MS _A ^{MS}	<0.08	1.63	1.48	1.31	0.64	4.58	3.51	mg/kg	0.01	A-T-019s

Envirolab Job Number: 23/02978

Client Project Name: Gravesham Leisure Centre

Client Project Ref: 52511

Lab Sample ID	23/02978/1	23/02978/2	23/02978/3	23/02978/4	23/02978/5	23/02978/6	23/02978/7	Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	BH1	WS1	WS2	WS3	WS4	WS5	WS6			
Depth to Top	0.05	0.00	0.00	0.00	0.00	0.10	0.00			
Depth To Bottom		0.30	0.30	0.30	0.30	0.40	0.30			
Date Sampled	17-Mar-23	16-Mar-23	16-Feb-23	16-Mar-24	16-Feb-24	16-Mar-25	16-Feb-25			
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES			
Sample Matrix Code	4AB	4AE	4AE	4AE	4AE	4AE	4AE			
VOC										
Dichlorodifluoromethane _A	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
Chloromethane _A	<10	-	-	-	-	-	-	µg/kg	10	A-T-006s
Vinyl Chloride (Chloroethene) _A [#]	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
Bromomethane _A [#]	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
Chloroethane _A [#]	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
Trichlorofluoromethane _A [#]	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
1,1-Dichloroethene _A [#]	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
Carbon Disulphide _A [#]	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
Dichloromethane _A	<5	-	-	-	-	-	-	µg/kg	5	A-T-006s
trans 1,2-Dichloroethene _A [#]	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
1,1-Dichloroethane _A [#]	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
cis 1,2-Dichloroethene _A [#]	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
2,2-Dichloropropane _A [#]	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
Bromochloromethane _A [#]	<5	-	-	-	-	-	-	µg/kg	5	A-T-006s
Chloroform _A [#]	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
1,1,1-Trichloroethane _A [#]	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
1,1-Dichloropropene _A [#]	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
Carbon Tetrachloride _A [#]	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
1,2-Dichloroethane _A [#]	<2	-	-	-	-	-	-	µg/kg	2	A-T-006s
Benzene _A [#]	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
Trichloroethene _A [#]	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
1,2-Dichloropropane _A [#]	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
Dibromomethane _A [#]	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
Bromodichloromethane _A [#]	<10	-	-	-	-	-	-	µg/kg	10	A-T-006s
cis 1,3-Dichloropropene _A [#]	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
Toluene _A [#]	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
trans 1,3-Dichloropropene _A [#]	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
1,1,2-Trichloroethane _A [#]	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
1,3-Dichloropropane _A [#]	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
Tetrachloroethene _A [#]	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
Dibromochloromethane _A [#]	<3	-	-	-	-	-	-	µg/kg	3	A-T-006s
1,2-Dibromoethane _A [#]	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s

Envirolab Job Number: 23/02978

Client Project Name: Gravesham Leisure Centre

Client Project Ref: 52511

Lab Sample ID	23/02978/1	23/02978/2	23/02978/3	23/02978/4	23/02978/5	23/02978/6	23/02978/7	Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	BH1	WS1	WS2	WS3	WS4	WS5	WS6			
Depth to Top	0.05	0.00	0.00	0.00	0.00	0.10	0.00			
Depth To Bottom		0.30	0.30	0.30	0.30	0.40	0.30			
Date Sampled	17-Mar-23	16-Mar-23	16-Feb-23	16-Mar-24	16-Feb-24	16-Mar-25	16-Feb-25			
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES			
Sample Matrix Code	4AB	4AE	4AE	4AE	4AE	4AE	4AE			
Chlorobenzene _A [#]	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
1,1,1,2-Tetrachloroethane _A	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
Ethylbenzene _A [#]	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
m & p Xylene _A [#]	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
o-Xylene _A [#]	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
Styrene _A [#]	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
Bromoform _A [#]	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
Isopropylbenzene _A [#]	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
1,1,2,2-Tetrachloroethane _A	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
1,2,3-Trichloropropane _A [#]	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
Bromobenzene _A [#]	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
n-Propylbenzene _A [#]	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
2-Chlorotoluene _A [#]	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
1,3,5-Trimethylbenzene _A [#]	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
4-Chlorotoluene _A [#]	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
tert-Butylbenzene _A [#]	<2	-	-	-	-	-	-	µg/kg	2	A-T-006s
1,2,4-Trimethylbenzene _A [#]	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
sec-Butylbenzene _A [#]	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
4-Isopropyltoluene _A [#]	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
1,3-Dichlorobenzene _A	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
1,4-Dichlorobenzene _A [#]	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
n-Butylbenzene _A [#]	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
1,2-Dichlorobenzene _A [#]	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
1,2-Dibromo-3-chloropropane (DCBP) _A	<2	-	-	-	-	-	-	µg/kg	2	A-T-006s
1,2,4-Trichlorobenzene _A	<3	-	-	-	-	-	-	µg/kg	3	A-T-006s
Hexachlorobutadiene _A [#]	<1	-	-	-	-	-	-	µg/kg	1	A-T-006s
1,2,3-Trichlorobenzene _A	<3	-	-	-	-	-	-	µg/kg	3	A-T-006s

Envirolab Job Number: 23/02978

Client Project Name: Gravesham Leisure Centre

Client Project Ref: 52511

Lab Sample ID	23/02978/1	23/02978/2	23/02978/3	23/02978/4	23/02978/5	23/02978/6	23/02978/7	Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	BH1	WS1	WS2	WS3	WS4	WS5	WS6			
Depth to Top	0.05	0.00	0.00	0.00	0.00	0.10	0.00			
Depth To Bottom		0.30	0.30	0.30	0.30	0.40	0.30			
Date Sampled	17-Mar-23	16-Mar-23	16-Feb-23	16-Mar-24	16-Feb-24	16-Mar-25	16-Feb-25			
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES			
Sample Matrix Code	4AB	4AE	4AE	4AE	4AE	4AE	4AE			
TPH CWG with Clean Up										
Ali >C5-C6 _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/kg	0.01	A-T-022s
Ali >C6-C8 _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/kg	0.01	A-T-022s
Ali >C8-C10 _A	<10	<1	<1	<1	<1	<1	<1	mg/kg	1	A-T-055s
Ali >C10-C12 _A ^{M#}	<10	<1	<1	<1	<1	<1	<1	mg/kg	1	A-T-055s
Ali >C12-C16 _A ^{M#}	<10	<1	<1	<1	<1	<1	<1	mg/kg	1	A-T-055s
Ali >C16-C21 _A ^{M#}	<10	<1	<1	<1	<1	<1	1	mg/kg	1	A-T-055s
Ali >C21-C35 _A ^{M#}	84	14	10	9	6	7	59	mg/kg	1	A-T-055s
Total Aliphatics _A	84	14	10	9	6	7	60	mg/kg	1	Calc-As Recd
Aro >C5-C7 _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/kg	0.01	A-T-022s
Aro >C7-C8 _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/kg	0.01	A-T-022s
Aro >C8-C10 _A	<10	<1	<1	<1	<1	<1	<1	mg/kg	1	A-T-055s
Aro >C10-C12 _A	<10	<1	<1	<1	<1	<1	<1	mg/kg	1	A-T-055s
Aro >C12-C16 _A	<10	<1	1	<1	<1	2	4	mg/kg	1	A-T-055s
Aro >C16-C21 _A ^{M#}	<10	2	4	4	1	18	20	mg/kg	1	A-T-055s
Aro >C21-C35 _A ^{M#}	53	11	17	16	8	61	57	mg/kg	1	A-T-055s
Total Aromatics _A	53	13	22	20	9	81	81	mg/kg	1	Calc-As Recd
TPH (Ali & Aro >C5-C35) _A	137	27	32	28	16	88	141	mg/kg	1	Calc-As Recd
BTEX - Benzene _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/kg	0.01	A-T-022s
BTEX - Toluene _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/kg	0.01	A-T-022s
BTEX - Ethyl Benzene _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/kg	0.01	A-T-022s
BTEX - m & p Xylene _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/kg	0.01	A-T-022s
BTEX - o Xylene _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/kg	0.01	A-T-022s
MTBE _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/kg	0.01	A-T-022s

Envirolab Job Number: 23/02978

Client Project Name: Gravesham Leisure Centre

Client Project Ref: 52511

Lab Sample ID	23/02978/8	23/02978/9	23/02978/10	23/02978/11	23/02978/12	23/02978/13	23/02978/14	Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	SA1	SA2	SA2	SA3	TP1	TP2	HP1			
Depth to Top	0.00	0.00	0.20	0.00	0.00	0.00	0.00			
Depth To Bottom	0.20	0.20	0.40	0.30	0.30	0.10	0.30			
Date Sampled	20-Mar-23	20-Mar-23	20-Mar-23	21-Mar-23	21-Mar-23	21-Mar-23	24-Mar-23			
Sample Type	Soil - ES	Solid	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES			
Sample Matrix Code	4ABE	7	4ABE	4AE	4AE	4AE	4ABE			
% Moisture at <40C _A	13.1	7.4	11.0	-	-	-	-	% w/w	0.1	A-T-044
% Stones >10mm _A	3.1	<0.1	15.5	<0.1	2.3	<0.1	<0.1	% w/w	0.1	A-T-044
pH _D ^{MS}	8.64	8.91	8.59	7.98	6.90	7.24	8.14	pH	0.01	A-T-031s
Sulphate (water sol 2:1) _D ^{MS}	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	g/l	0.01	A-T-026s
Sulphate (acid soluble) _D ^{MS}	580	360	1300	510	520	580	570	mg/kg	200	A-T-028s
Total Organic Carbon _D ^{MS}	11.4	-	3.68	1.80	-	2.90	-	% w/w	0.03	A-T-032s
Arsenic _D ^{MS}	10	<1	3	8	8	6	7	mg/kg	1	A-T-024s
Cadmium _D ^{MS}	2.4	0.6	1.5	0.7	1.2	1.0	2.7	mg/kg	0.5	A-T-024s
Copper _D ^{MS}	84	63	36	16	15	17	115	mg/kg	1	A-T-024s
Chromium _D ^{MS}	28	20	41	23	36	23	36	mg/kg	1	A-T-024s
Chromium (hexavalent) _D	<1	<1	<1	-	-	-	-	mg/kg	1	A-T-040s
Lead _D ^{MS}	114	15	90	43	35	26	229	mg/kg	1	A-T-024s
Mercury _D	2.17	1.45	1.85	<0.17	<0.17	<0.17	1.99	mg/kg	0.17	A-T-024s
Nickel _D ^{MS}	35	36	29	15	26	18	29	mg/kg	1	A-T-024s
Selenium _D ^{MS}	<1	<1	<1	<1	<1	<1	<1	mg/kg	1	A-T-024s
Zinc _D ^{MS}	157	35	94	77	100	69	464	mg/kg	5	A-T-024s

Envirolab Job Number: 23/02978

Client Project Name: Gravesham Leisure Centre

Client Project Ref: 52511

Lab Sample ID	23/02978/8	23/02978/9	23/02978/10	23/02978/11	23/02978/12	23/02978/13	23/02978/14	Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	SA1	SA2	SA2	SA3	TP1	TP2	HP1			
Depth to Top	0.00	0.00	0.20	0.00	0.00	0.00	0.00			
Depth To Bottom	0.20	0.20	0.40	0.30	0.30	0.10	0.30			
Date Sampled	20-Mar-23	20-Mar-23	20-Mar-23	21-Mar-23	21-Mar-23	21-Mar-23	24-Mar-23			
Sample Type	Soil - ES	Solid	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES			
Sample Matrix Code	4ABE	7	4ABE	4AE	4AE	4AE	4ABE			
Asbestos in Soil (inc. matrix) ^										
Asbestos in soil _D [#]	NAD	NAD	NAD	NAD	NAD	NAD	NAD			A-T-045
Asbestos Matrix (visual) _D	-	-	-	-	-	-	-			A-T-045
Asbestos Matrix (microscope) _D	-	-	-	-	-	-	-			A-T-045
Asbestos ACM - Suitable for Water Absorption Test? _D	N/A	N/A	N/A	N/A	N/A	N/A	N/A			A-T-045

Envirolab Job Number: 23/02978

Client Project Name: Gravesham Leisure Centre

Client Project Ref: 52511

Lab Sample ID	23/02978/8	23/02978/9	23/02978/10	23/02978/11	23/02978/12	23/02978/13	23/02978/14	Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	SA1	SA2	SA2	SA3	TP1	TP2	HP1			
Depth to Top	0.00	0.00	0.20	0.00	0.00	0.00	0.00			
Depth To Bottom	0.20	0.20	0.40	0.30	0.30	0.10	0.30			
Date Sampled	20-Mar-23	20-Mar-23	20-Mar-23	21-Mar-23	21-Mar-23	21-Mar-23	24-Mar-23			
Sample Type	Soil - ES	Solid	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES			
Sample Matrix Code	4ABE	7	4ABE	4AE	4AE	4AE	4ABE			
PAH-16MS										
Acenaphthene _A ^{MS}	0.32	0.42	1.08	<0.01	<0.01	<0.01	0.07	mg/kg	0.01	A-T-019s
Acenaphthylene _A ^{MS}	0.14	0.70	0.27	<0.01	<0.01	<0.01	0.04	mg/kg	0.01	A-T-019s
Anthracene _A ^{MS}	1.36	2.39	3.71	0.02	<0.02	<0.02	0.30	mg/kg	0.02	A-T-019s
Benzo(a)anthracene _A ^{MS}	2.94	6.29	11.1	0.18	0.05	0.06	1.31	mg/kg	0.04	A-T-019s
Benzo(a)pyrene _A ^{MS}	2.67	4.19	7.89	0.17	0.05	0.06	1.04	mg/kg	0.04	A-T-019s
Benzo(b)fluoranthene _A ^{MS}	3.37	5.43	9.12	0.23	0.07	0.09	1.32	mg/kg	0.05	A-T-019s
Benzo(ghi)perylene _A ^{MS}	1.54	2.55	3.85	0.11	<0.05	<0.05	0.57	mg/kg	0.05	A-T-019s
Benzo(k)fluoranthene _A ^{MS}	1.09	1.86	3.37	0.08	<0.07	<0.07	0.42	mg/kg	0.07	A-T-019s
Chrysene _A ^{MS}	2.95	5.87	10	0.21	<0.06	0.08	1.28	mg/kg	0.06	A-T-019s
Dibenzo(ah)anthracene _A ^{MS}	0.31	0.59	0.88	<0.04	<0.04	<0.04	0.12	mg/kg	0.04	A-T-019s
Fluoranthene _A ^{MS}	8.15	14.6	27	0.41	0.12	0.13	3.07	mg/kg	0.08	A-T-019s
Fluorene _A ^{MS}	0.47	0.51	0.89	<0.01	<0.01	<0.01	0.08	mg/kg	0.01	A-T-019s
Indeno(123-cd)pyrene _A ^{MS}	1.73	2.89	4.64	0.11	<0.03	0.05	0.67	mg/kg	0.03	A-T-019s
Naphthalene _A ^{MS}	0.03	0.04	0.09	<0.03	<0.03	<0.03	0.14	mg/kg	0.03	A-T-019s
Phenanthrene _A ^{MS}	5.93	8.28	16.1	0.13	0.04	0.05	1.46	mg/kg	0.03	A-T-019s
Pyrene _A ^{MS}	6.77	13.5	23.3	0.36	0.11	0.11	2.56	mg/kg	0.07	A-T-019s
Total PAH-16MS _A ^{MS}	39.8	70.1	123	2.01	0.44	0.63	14.4	mg/kg	0.01	A-T-019s

Envirolab Job Number: 23/02978

Client Project Name: Gravesham Leisure Centre

Client Project Ref: 52511

Lab Sample ID	23/02978/8	23/02978/9	23/02978/10	23/02978/11	23/02978/12	23/02978/13	23/02978/14	Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	SA1	SA2	SA2	SA3	TP1	TP2	HP1			
Depth to Top	0.00	0.00	0.20	0.00	0.00	0.00	0.00			
Depth To Bottom	0.20	0.20	0.40	0.30	0.30	0.10	0.30			
Date Sampled	20-Mar-23	20-Mar-23	20-Mar-23	21-Mar-23	21-Mar-23	21-Mar-23	24-Mar-23			
Sample Type	Soil - ES	Solid	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES			
Sample Matrix Code	4ABE	7	4ABE	4AE	4AE	4AE	4ABE			
TPH Total with ID + GC Trace										
TPH total (>C6-C40) _A ^{MS}	384	1560	1990	-	-	-	-	mg/kg	10	A-T-007s
TPH FID Chromatogram _A	Appended	Appended	Appended	-	-	-	-			A-T-007s
TPH ID Interpretation _A	C12-C44 with some PAHs and other unknown hydrocarbon s	C10-C44 with some PAHs and other unknown hydrocarbon s	C10-C44 with some PAHs and other unknown hydrocarbon s	-	-	-	-			A-T-007s

Envirolab Job Number: 23/02978

Client Project Name: Gravesham Leisure Centre

Client Project Ref: 52511

Lab Sample ID	23/02978/8	23/02978/9	23/02978/10	23/02978/11	23/02978/12	23/02978/13	23/02978/14	Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	SA1	SA2	SA2	SA3	TP1	TP2	HP1			
Depth to Top	0.00	0.00	0.20	0.00	0.00	0.00	0.00			
Depth To Bottom	0.20	0.20	0.40	0.30	0.30	0.10	0.30			
Date Sampled	20-Mar-23	20-Mar-23	20-Mar-23	21-Mar-23	21-Mar-23	21-Mar-23	24-Mar-23			
Sample Type	Soil - ES	Solid	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES			
Sample Matrix Code	4ABE	7	4ABE	4AE	4AE	4AE	4ABE			
TPH CWG with Clean Up										
Ali >C5-C6 _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/kg	0.01	A-T-022s
Ali >C6-C8 _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/kg	0.01	A-T-022s
Ali >C8-C10 _A	<10	<10	<10	<1	<1	<1	<1	mg/kg	1	A-T-055s
Ali >C10-C12 _A ^{M#}	<10	<10	<10	<1	<1	<1	<1	mg/kg	1	A-T-055s
Ali >C12-C16 _A ^{M#}	<10	<10	<10	<1	<1	<1	<1	mg/kg	1	A-T-055s
Ali >C16-C21 _A ^{M#}	<10	<10	11	1	<1	<1	2	mg/kg	1	A-T-055s
Ali >C21-C35 _A ^{M#}	103	253	78	12	6	9	200	mg/kg	1	A-T-055s
Total Aliphatics _A	103	253	89	13	6	9	203	mg/kg	1	Calc-As Recd
Aro >C5-C7 _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/kg	0.01	A-T-022s
Aro >C7-C8 _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/kg	0.01	A-T-022s
Aro >C8-C10 _A	<10	<10	<10	<1	<1	<1	<1	mg/kg	1	A-T-055s
Aro >C10-C12 _A	<10	<10	<10	<1	<1	<1	<1	mg/kg	1	A-T-055s
Aro >C12-C16 _A	20	13	108	2	<1	<1	8	mg/kg	1	A-T-055s
Aro >C16-C21 _A ^{M#}	77	58	801	6	2	3	110	mg/kg	1	A-T-055s
Aro >C21-C35 _A ^{M#}	282	242	1510	16	11	6	308	mg/kg	1	A-T-055s
Total Aromatics _A	379	313	2420	24	13	9	426	mg/kg	1	Calc-As Recd
TPH (Ali & Aro >C5-C35) _A	482	566	2510	37	19	18	629	mg/kg	1	Calc-As Recd
BTEX - Benzene _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/kg	0.01	A-T-022s
BTEX - Toluene _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/kg	0.01	A-T-022s
BTEX - Ethyl Benzene _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/kg	0.01	A-T-022s
BTEX - m & p Xylene _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/kg	0.01	A-T-022s
BTEX - o Xylene _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/kg	0.01	A-T-022s
MTBE _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/kg	0.01	A-T-022s

Envirolab Job Number: 23/02978

Client Project Name: Gravesham Leisure Centre

Client Project Ref: 52511

Lab Sample ID	23/02978/15	23/02978/16	23/02978/17	23/02978/18				Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	HP2	HP3	HP4	HP5						
Depth to Top	0.00	0.20	0.00	0.00						
Depth To Bottom	0.30	0.40	0.30	0.30						
Date Sampled	24-Mar-23	23-Feb-23	23-Mar-23	23-Mar-23						
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES						
Sample Matrix Code	4AE	4AE	4ABE	4ABE						
% Stones >10mm _A	<0.1	15.1	9.6	10.9				% w/w	0.1	A-T-044
pH _D ^{MF}	7.70	9.69	8.54	8.39				pH	0.01	A-T-031s
Sulphate (water sol 2:1) _D ^{MF}	<0.01	<0.01	0.04	0.04				g/l	0.01	A-T-026s
Sulphate (acid soluble) _D ^{MF}	730	1100	700	540				mg/kg	200	A-T-028s
Arsenic _D ^{MF}	4	7	5	6				mg/kg	1	A-T-024s
Cadmium _D ^{MF}	2.6	2.0	1.4	1.9				mg/kg	0.5	A-T-024s
Copper _D ^{MF}	42	16	76	38				mg/kg	1	A-T-024s
Chromium _D ^{MF}	29	21	21	117				mg/kg	1	A-T-024s
Lead _D ^{MF}	67	161	33	108				mg/kg	1	A-T-024s
Mercury _D	0.36	1.39	1.15	1.24				mg/kg	0.17	A-T-024s
Nickel _D ^{MF}	23	16	19	19				mg/kg	1	A-T-024s
Selenium _D ^{MF}	<1	<1	<1	<1				mg/kg	1	A-T-024s
Zinc _D ^{MF}	327	182	116	323				mg/kg	5	A-T-024s

Envirolab Job Number: 23/02978

Client Project Name: Gravesham Leisure Centre

Client Project Ref: 52511

Lab Sample ID	23/02978/15	23/02978/16	23/02978/17	23/02978/18				Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	HP2	HP3	HP4	HP5						
Depth to Top	0.00	0.20	0.00	0.00						
Depth To Bottom	0.30	0.40	0.30	0.30						
Date Sampled	24-Mar-23	23-Feb-23	23-Mar-23	23-Mar-23						
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES						
Sample Matrix Code	4AE	4AE	4ABE	4ABE						
Asbestos in Soil (inc. matrix) ^										
Asbestos in soil _D [#]	NAD	NAD	NAD	NAD						A-T-045
Asbestos Matrix (visual) _D	-	-	-	-						A-T-045
Asbestos Matrix (microscope) _D	-	-	-	-						A-T-045
Asbestos ACM - Suitable for Water Absorption Test? _D	N/A	N/A	N/A	N/A						A-T-045

Envirolab Job Number: 23/02978

Client Project Name: Gravesham Leisure Centre

Client Project Ref: 52511

Lab Sample ID	23/02978/15	23/02978/16	23/02978/17	23/02978/18				Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	HP2	HP3	HP4	HP5						
Depth to Top	0.00	0.20	0.00	0.00						
Depth To Bottom	0.30	0.40	0.30	0.30						
Date Sampled	24-Mar-23	23-Feb-23	23-Mar-23	23-Mar-23						
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES						
Sample Matrix Code	4AE	4AE	4ABE	4ABE						
PAH-16MS										
Acenaphthene _A ^{MS}	<0.01	<0.01	0.03	0.04				mg/kg	0.01	A-T-019s
Acenaphthylene _A ^{MS}	<0.01	<0.01	<0.01	0.03				mg/kg	0.01	A-T-019s
Anthracene _A ^{MS}	<0.02	0.03	0.05	0.11				mg/kg	0.02	A-T-019s
Benzo(a)anthracene _A ^{MS}	0.07	0.09	0.18	0.87				mg/kg	0.04	A-T-019s
Benzo(a)pyrene _A ^{MS}	0.07	0.11	0.16	1.02				mg/kg	0.04	A-T-019s
Benzo(b)fluoranthene _A ^{MS}	0.11	0.14	0.22	1.42				mg/kg	0.05	A-T-019s
Benzo(ghi)perylene _A ^{MS}	<0.05	0.10	0.11	0.89				mg/kg	0.05	A-T-019s
Benzo(k)fluoranthene _A ^{MS}	<0.07	<0.07	0.08	0.54				mg/kg	0.07	A-T-019s
Chrysene _A ^{MS}	0.11	0.10	0.21	1.19				mg/kg	0.06	A-T-019s
Dibenzo(ah)anthracene _A ^{MS}	<0.04	<0.04	<0.04	0.13				mg/kg	0.04	A-T-019s
Fluoranthene _A ^{MS}	0.21	0.17	0.44	2.48				mg/kg	0.08	A-T-019s
Fluorene _A ^{MS}	<0.01	<0.01	0.02	0.02				mg/kg	0.01	A-T-019s
Indeno(123-cd)pyrene _A ^{MS}	0.05	0.10	0.12	0.86				mg/kg	0.03	A-T-019s
Naphthalene _A ^{MS}	<0.03	<0.03	<0.03	<0.03				mg/kg	0.03	A-T-019s
Phenanthrene _A ^{MS}	0.10	0.08	0.27	0.72				mg/kg	0.03	A-T-019s
Pyrene _A ^{MS}	0.19	0.15	0.39	2.23				mg/kg	0.07	A-T-019s
Total PAH-16MS _A ^{MS}	0.91	1.07	2.28	12.6				mg/kg	0.01	A-T-019s

Envirolab Job Number: 23/02978

Client Project Name: Gravesham Leisure Centre

Client Project Ref: 52511

Lab Sample ID	23/02978/15	23/02978/16	23/02978/17	23/02978/18				Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	HP2	HP3	HP4	HP5						
Depth to Top	0.00	0.20	0.00	0.00						
Depth To Bottom	0.30	0.40	0.30	0.30						
Date Sampled	24-Mar-23	23-Feb-23	23-Mar-23	23-Mar-23						
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES						
Sample Matrix Code	4AE	4AE	4ABE	4ABE						
Speciated PCB-EC7 & WHO12										
PCB BZ 28 _A ^{MS}	<0.003	-	-	-				mg/kg	0.003	A-T-004s
PCB BZ 52 _A ^{MS}	<0.002	-	-	-				mg/kg	0.002	A-T-004s
PCB BZ 81 _A ^{MS}	<0.005	-	-	-				mg/kg	0.005	A-T-004s
PCB BZ 101 _A ^{MS}	<0.004	-	-	-				mg/kg	0.004	A-T-004s
PCB BZ 105 _A ^{MS}	<0.005	-	-	-				mg/kg	0.005	A-T-004s
PCB BZ 114 _A ^{MS}	<0.005	-	-	-				mg/kg	0.005	A-T-004s
PCB BZ 118 _A ^{MS}	<0.007	-	-	-				mg/kg	0.007	A-T-004s
PCB BZ 123 _A ^{MS}	<0.005	-	-	-				mg/kg	0.005	A-T-004s
PCB BZ 126 _A ^{MS}	<0.005	-	-	-				mg/kg	0.005	A-T-004s
PCB BZ 138 _A ^{MS}	<0.006	-	-	-				mg/kg	0.006	A-T-004s
PCB BZ 153 _A ^{MS}	<0.004	-	-	-				mg/kg	0.004	A-T-004s
PCB BZ 156 _A ^{MS}	<0.005	-	-	-				mg/kg	0.005	A-T-004s
PCB BZ 157 _A ^{MS}	<0.005	-	-	-				mg/kg	0.005	A-T-004s
PCB BZ 167 _A ^{MS}	<0.005	-	-	-				mg/kg	0.005	A-T-004s
PCB BZ 169 _A ^{MS}	<0.005	-	-	-				mg/kg	0.005	A-T-004s
PCB BZ 180 _A ^{MS}	<0.004	-	-	-				mg/kg	0.004	A-T-004s
PCB BZ 189 _A ^{MS}	<0.005	-	-	-				mg/kg	0.005	A-T-004s
PCB BZ 77 _A ^{MS}	<0.005	-	-	-				mg/kg	0.005	A-T-004s
Total Speciated PCB-EC7 & WHO12 _A ^{MS}	<0.007	-	-	-				mg/kg	0.003	A-T-004s

Envirolab Job Number: 23/02978

Client Project Name: Gravesham Leisure Centre

Client Project Ref: 52511

Lab Sample ID	23/02978/15	23/02978/16	23/02978/17	23/02978/18					
Client Sample No									
Client Sample ID	HP2	HP3	HP4	HP5					
Depth to Top	0.00	0.20	0.00	0.00					
Depth To Bottom	0.30	0.40	0.30	0.30					
Date Sampled	24-Mar-23	23-Feb-23	23-Mar-23	23-Mar-23					
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES					
Sample Matrix Code	4AE	4AE	4ABE	4ABE					
TPH CWG with Clean Up									
Ali >C5-C6 _A [#]	<0.01	<0.01	<0.01	<0.01			mg/kg	0.01	A-T-022s
Ali >C6-C8 _A [#]	<0.01	<0.01	<0.01	<0.01			mg/kg	0.01	A-T-022s
Ali >C8-C10 _A	<1	<1	<1	<1			mg/kg	1	A-T-055s
Ali >C10-C12 _A ^{M#}	<1	<1	<1	<1			mg/kg	1	A-T-055s
Ali >C12-C16 _A ^{M#}	<1	<1	<1	1			mg/kg	1	A-T-055s
Ali >C16-C21 _A ^{M#}	2	<1	<1	4			mg/kg	1	A-T-055s
Ali >C21-C35 _A ^{M#}	54	10	11	164			mg/kg	1	A-T-055s
Total Aliphatics _A	56	10	11	169			mg/kg	1	Calc-Aa Recd
Aro >C5-C7 _A [#]	<0.01	<0.01	<0.01	<0.01			mg/kg	0.01	A-T-022s
Aro >C7-C8 _A [#]	<0.01	<0.01	<0.01	<0.01			mg/kg	0.01	A-T-022s
Aro >C8-C10 _A	<1	<1	<1	2			mg/kg	1	A-T-055s
Aro >C10-C12 _A	<1	<1	<1	4			mg/kg	1	A-T-055s
Aro >C12-C16 _A	2	2	3	7			mg/kg	1	A-T-055s
Aro >C16-C21 _A ^{M#}	5	5	18	56			mg/kg	1	A-T-055s
Aro >C21-C35 _A ^{M#}	17	17	41	286			mg/kg	1	A-T-055s
Total Aromatics _A	25	24	62	355			mg/kg	1	Calc-Aa Recd
TPH (Ali & Aro >C5-C35) _A	81	34	73	524			mg/kg	1	Calc-Aa Recd
BTEX - Benzene _A [#]	<0.01	<0.01	<0.01	<0.01			mg/kg	0.01	A-T-022s
BTEX - Toluene _A [#]	<0.01	<0.01	<0.01	<0.01			mg/kg	0.01	A-T-022s
BTEX - Ethyl Benzene _A [#]	<0.01	<0.01	<0.01	<0.01			mg/kg	0.01	A-T-022s
BTEX - m & p Xylene _A [#]	<0.01	<0.01	<0.01	<0.01			mg/kg	0.01	A-T-022s
BTEX - o Xylene _A [#]	<0.01	<0.01	<0.01	<0.01			mg/kg	0.01	A-T-022s
MTBE _A [#]	<0.01	<0.01	<0.01	<0.01			mg/kg	0.01	A-T-022s

REPORT NOTES

General

This report shall not be reproduced, except in full, without written approval from Envirolab.

The results reported herein relate only to the material supplied to the laboratory.

The residue of any samples contained within this report, and any received with the same delivery, will be disposed of six weeks after initial scheduling. For samples tested for Asbestos we will retain a portion of the dried sample for a minimum of six months after the initial Asbestos testing is completed.

Analytical results reflect the quality of the sample at the time of analysis only.

Opinions and interpretations expressed are outside the scope of our accreditation.

If results are in italic font they are associated with an AQC failure, these are not accredited and are unreliable.

A deviating samples report is appended and will indicate if samples or tests have been found to be deviating. Any test results affected may not be an accurate record of the concentration at the time of sampling and, as a result, may be invalid.

The Client Sample No, Client Sample ID, Depth to Top, Depth to Bottom and Date Sampled were all provided by the client.

Soil chemical analysis:

All results are reported as dry weight (<40°C).

For samples with Matrix Codes 1 - 6 natural stones, brick and concrete fragments >10mm and any extraneous material (visible glass, metal or twigs) are removed and excluded from the sample prior to analysis and reported results corrected to a whole sample basis. This is reported as '% stones >10mm'.

For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis and this supersedes any "A" subscripts

All analysis is performed on the sample as received for soil samples which are positive for asbestos or the client has informed asbestos may be present and/or if they are from outside the European Union and this supersedes any "D" subscripts.

TPH analysis of water by method A-T-007:

Free and visible oils are excluded from the sample used for analysis so that the reported result represents the dissolved phase only.

Electrical Conductivity of water by Method A-T-037:

Results greater than 12900µS/cm @ 25°C / 11550µS/cm @ 20°C fall outside the calibration range and as such are unaccredited.

Asbestos:

Asbestos in soil analysis is performed on a dried aliquot of the submitted sample and cannot guarantee to identify asbestos if only present in small numbers as discrete fibres/fragments in the original sample.

Stones etc. are not removed from the sample prior to analysis.

Quantification of asbestos is a 3 stage process including visual identification, hand picking and weighing and fibre counting by sedimentation/phase contrast optical microscopy if required. If asbestos is identified as being present but is not in a form that is suitable for analysis by hand picking and weighing (normally if the asbestos is present as free fibres) quantification by sedimentation is performed. Where ACMs are found a percentage asbestos is assigned to each with reference to 'HSG264, Asbestos: The survey guide' and the calculated asbestos content is expressed as a percentage of the dried soil sample aliquot used.

Predominant Matrix Codes:

1 = SAND, 2 = LOAM, 3 = CLAY, 4 = LOAM/SAND, 5 = SAND/CLAY, 6 = CLAY/LOAM, 7 = OTHER, 8 = Asbestos bulk ID sample, 9 = INCINERATOR ASH.

Samples with Matrix Code 7 & 8 are not predominantly a SAND/LOAM/CLAY mix and are not covered by our BSEN 17025 or MCERTS accreditations, with the exception of bulk asbestos which are BSEN 17025 accredited.

Secondary Matrix Codes:

A = contains stones, B = contains construction rubble, C = contains visible hydrocarbons, D = contains glass/metal,

E = contains roots/twigs.

Key:

IS indicates Insufficient Sample for analysis.

US indicates Unsuitable Sample for analysis.

NDP indicates No Determination Possible.

NAD indicates No Asbestos Detected.

N/A indicates Not Applicable.

Superscript # indicates method accredited to ISO 17025.

Superscript "M" indicates method accredited to MCERTS.

Subscript "A" indicates analysis performed on the sample as received.

Subscript "D" indicates analysis performed on the dried sample, crushed to pass a 2mm sieve

Subscript "A" indicates analysis has dependant options against results. Testing dependant on results appear in the comments area of your sample receipt.

EPH CWG results have humics mathematically subtracted through instrument calculation

TPH results "with Cleanup" indicates results cleaned up with Silica during extraction

EPH CWG GCxGC ID from TPH CWG

Where we have identified humic substances in any ID's from TPH CWG with Clean Up please note that the concentration of these

humic substances is not included in the quantified results and are included in the ID for information.

Please contact us if you need any further information.

v2

Envirolab Deviating Samples Report

Units 7&8 Sandpits Business Park, Mottram Road, Hyde, SK14 3AR
Tel. 0161 368 4921 email. ask@envirolab.co.uk

Client: RSK Environment Ltd Tonbridge, Anerley Court, Half Moon Lane,
Hildenborough, Tonbridge, Kent, TN11 9HU

Project: Gravesham Leisure Centre
Clients Project No: 52511

Project No: 23/02978
Date Received: 29/03/2023 (am)
Cool Box Temperatures (°C): 10.4 & 10.7

Lab Sample ID	23/02978/3	23/02978/16
Client Sample No		
Client Sample ID/Depth	WS2 0.00-0.30m	HP3 0.20-0.40m
Date Sampled	16/02/23	23/02/23
Deviation Code		
F	✓	✓

Key

F

Maximum holding time exceeded between sampling date and analysis for analytes listed below

HOLDING TIME EXCEEDANCES

Lab Sample ID	23/02978/3	23/02978/16
Client Sample No		
Client Sample ID/Depth	WS2 0.00-0.30m	HP3 0.20-0.40m
Date Sampled	16/02/23	23/02/23
PAH-16MS	✓	✓
Sulphate (acid soluble)	✓	✓
Sulphate (water sol 2:1)	✓	✓
EPHCWG	✓	✓
VPHCWG	✓	✓

If, at any point before reaching the laboratory, the temperature of the samples has breached those set in published standards, e.g. BS-EN 5667-3, ISO 18400-102:2017, then the concentration of any affected analytes may differ from that at the time of sampling.

Envirolab Analysis Dates

Lab Sample ID	23/02978/1	23/02978/2	23/02978/3	23/02978/4	23/02978/5	23/02978/6	23/02978/7	23/02978/8	23/02978/9	23/02978/10	23/02978/11	23/02978/12
Client Sample No												
Client Sample ID/Depth	BH1 0.05m	WS1 0.00-0.30m	WS2 0.00-0.30m	WS3 0.00-0.30m	WS4 0.00-0.30m	WS5 0.10-0.40m	WS6 0.00-0.30m	SA1 0.00-0.20m	SA2 0.00-0.20m	SA2 0.20-0.40m	SA3 0.00-0.30m	TP1 0.00-0.30m
Date Sampled	17/03/23	16/03/23	16/02/23	16/03/24	16/02/24	16/03/25	16/02/25		20/03/23	20/03/23	20/03/23	21/03/23
A-T-004s								03/04/2023		03/04/2023		
A-T-006s	03/04/2023											
A-T-007s								31/03/2023	31/03/2023	31/03/2023		
A-T-019s	06/04/2023	06/04/2023	06/04/2023	06/04/2023	06/04/2023	06/04/2023	06/04/2023	06/04/2023	06/04/2023	06/04/2023	06/04/2023	06/04/2023
A-T-022s	03/04/2023	03/04/2023	03/04/2023	03/04/2023	03/04/2023	03/04/2023	03/04/2023	03/04/2023	03/04/2023	03/04/2023	03/04/2023	03/04/2023
A-T-024s	07/04/2023	07/04/2023	07/04/2023	07/04/2023	07/04/2023	07/04/2023	07/04/2023	07/04/2023	07/04/2023	07/04/2023	07/04/2023	07/04/2023
A-T-025w										11/04/2023		
A-T-026s	06/04/2023	06/04/2023	06/04/2023	06/04/2023	06/04/2023	06/04/2023	06/04/2023	06/04/2023	06/04/2023	06/04/2023	06/04/2023	06/04/2023
A-T-026w								11/04/2023		11/04/2023		
A-T-026w (F)								11/04/2023		11/04/2023		
A-T-028s	12/04/2023	12/04/2023	12/04/2023	12/04/2023	12/04/2023	12/04/2023	12/04/2023	12/04/2023	12/04/2023	12/04/2023	12/04/2023	12/04/2023
A-T-030s								07/04/2023		06/04/2023		
A-T-031s	11/04/2023	11/04/2023	11/04/2023	11/04/2023	11/04/2023	11/04/2023	11/04/2023	11/04/2023	11/04/2023	11/04/2023	11/04/2023	11/04/2023
A-T-031w								11/04/2023		11/04/2023		
A-T-032s		06/04/2023		06/04/2023			06/04/2023	11/04/2023		06/04/2023	06/04/2023	
A-T-032w								11/04/2023		11/04/2023		
A-T-037w								11/04/2023		11/04/2023		
A-T-040s	06/04/2023					06/04/2023		06/04/2023	06/04/2023	06/04/2023		
A-T-044	11/04/2023	11/04/2023	11/04/2023	11/04/2023	11/04/2023	11/04/2023	11/04/2023	11/04/2023	11/04/2023	11/04/2023	11/04/2023	11/04/2023
A-T-045	03/04/2023	03/04/2023	03/04/2023	03/04/2023	03/04/2023	03/04/2023	03/04/2023	03/04/2023	03/04/2023	03/04/2023	03/04/2023	03/04/2023
A-T-050w								11/04/2023		11/04/2023		
A-T-055s	06/04/2023	06/04/2023	06/04/2023	06/04/2023	06/04/2023	06/04/2023	06/04/2023	06/04/2023	06/04/2023	06/04/2023	06/04/2023	06/04/2023
A-T-ANCs								11/04/2023		11/04/2023		
Calc-As Recd	06/04/2023	06/04/2023	06/04/2023	06/04/2023	06/04/2023	06/04/2023	06/04/2023	06/04/2023	06/04/2023	06/04/2023	06/04/2023	06/04/2023
Calc-no stones								11/04/2023		11/04/2023		
Probe (w)								11/04/2023		11/04/2023		

Lab Sample ID	23/02978/13	23/02978/14	23/02978/15	23/02978/16	23/02978/17	23/02978/18
Client Sample No						
Client Sample ID/Depth	TP2 0.00-0.10m	HP1 0.00-0.30m	HP2 0.00-0.30m	HP3 0.20-0.40m	HP4 0.00-0.30m	HP5 0.00-0.30m
Date Sampled	21/03/23	24/03/23	24/03/23	23/02/23	23/03/23	23/03/23
A-T-004s			03/04/2023			
A-T-006s						
A-T-007s						
A-T-019s	06/04/2023	06/04/2023	06/04/2023	06/04/2023	06/04/2023	06/04/2023
A-T-022s	03/04/2023	03/04/2023	03/04/2023	03/04/2023	03/04/2023	03/04/2023
A-T-024s	07/04/2023	07/04/2023	07/04/2023	07/04/2023	07/04/2023	07/04/2023
A-T-025w						
A-T-026s	06/04/2023	06/04/2023	06/04/2023	06/04/2023	06/04/2023	06/04/2023
A-T-026w						
A-T-026w (F)						
A-T-028s	12/04/2023	12/04/2023	12/04/2023	12/04/2023	12/04/2023	12/04/2023
A-T-030s						
A-T-031s	11/04/2023	11/04/2023	11/04/2023	11/04/2023	11/04/2023	11/04/2023
A-T-031w						
A-T-032s	06/04/2023					
A-T-032w						
A-T-037w						
A-T-040s						
A-T-044	11/04/2023	11/04/2023	11/04/2023	11/04/2023	11/04/2023	11/04/2023
A-T-045	03/04/2023	03/04/2023	03/04/2023	03/04/2023	03/04/2023	03/04/2023
A-T-050w						
A-T-055s	06/04/2023	06/04/2023	06/04/2023	06/04/2023	06/04/2023	06/04/2023
A-T-ANCs						
Calc-As Recd	06/04/2023	06/04/2023	06/04/2023	06/04/2023	06/04/2023	06/04/2023
Calc-no stones						
Probe (w)						

The above dates are the analysis completion dates, please note that these are not necessarily the date that the analysis was weighed/extracted.

End of Report

FINAL ANALYTICAL TEST REPORT

Envirolab Job Number: 23/02978
Issue Number: 1

Date: 12 April, 2023

Client: RSK Environment Ltd Tonbridge
Anerley Court, Half Moon Lane, Hildenborough
Tonbridge
Kent
TN11 9HU

Project Manager: Josh Curnow/Niki Dubber
Project Name: Gravesham Leisure Centre
Project Ref: 52511
Order No: N/A
Date Samples Received: 23/03/23
Date Instructions Received: 29/03/23
Date Analysis Completed: 12/04/23

Approved by:



Danielle Brierley
Deputy Client Services Supervisor

Envirolab Job Number: 23/02978

Client Project Name: Gravesham Leisure Centre

Client Project Ref: 52511

Lab Sample ID	23/02978/1	23/02978/2	23/02978/3	23/02978/4	23/02978/5	23/02978/6	23/02978/7	Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	BH1	WS1	WS2	WS3	WS4	WS5	WS6			
Depth to Top	0.05	0.00	0.00	0.00	0.00	0.10	0.00			
Depth To Bottom		0.30	0.30	0.30	0.30	0.40	0.30			
Date Sampled	17-Mar-23	16-Mar-23	16-Feb-23	16-Mar-24	16-Feb-24	16-Mar-25	16-Feb-25			
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES			
Sample Matrix Code	4AB	4AE	4AE	4AE	4AE	4AE	4AE			
% Stones >10mm _A	6.4	<0.1	<0.1	<0.1	<0.1	<0.1	5.6	% w/w	0.1	A-T-044
pH ₀ ^{MS}	9.49	8.19	7.86	8.09	6.07	8.02	8.10	pH	0.01	A-T-031s
Sulphate (water sol 2:1) ₀ ^{MS}	0.06	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	g/l	0.01	A-T-028s
Sulphate (acid soluble) ₀ ^{MS}	<1000	490	850	370	620	310	650	mg/kg	200	A-T-025s
Total Organic Carbon ₀ ^{MS}	-	1.77	-	1.69	-	-	2.92	% w/w	0.03	A-T-032s
Arsenic ₀ ^{MS}	<1	9	7	2	5	10	6	mg/kg	1	A-T-024s
Cadmium ₀ ^{MS}	0.7	1.7	1.0	0.9	1.1	0.7	13.4	mg/kg	0.5	A-T-024s
Copper ₀ ^{MS}	7	40	20	16	17	17	51	mg/kg	1	A-T-024s
Chromium ₀ ^{MS}	10	26	32	34	35	19	41	mg/kg	1	A-T-024s
Chromium (hexavalent) ₀	<1	-	-	-	-	<1	-	mg/kg	1	A-T-040s
Lead ₀ ^{MS}	3	34	60	48	39	47	48	mg/kg	1	A-T-024s
Mercury ₀	1.75	<0.17	<0.17	<0.17	<0.17	<0.17	0.67	mg/kg	0.17	A-T-024s
Nickel ₀ ^{MS}	4	28	21	17	25	11	33	mg/kg	1	A-T-024s
Selenium ₀ ^{MS}	<1	<1	<1	<1	<1	<1	<1	mg/kg	1	A-T-024s
Zinc ₀ ^{MS}	36	76	88	97	93	71	146	mg/kg	5	A-T-024s

Envirolab Job Number: 23/02978

Client Project Name: Gravesham Leisure Centre

Client Project Ref: 52511

Lab Sample ID	23/02978/1	23/02978/2	23/02978/3	23/02978/4	23/02978/5	23/02978/6	23/02978/7	Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	BH1	WS1	WS2	WS3	WS4	WS5	WS6			
Depth to Top	0.05	0.00	0.00	0.00	0.00	0.10	0.00			
Depth To Bottom		0.30	0.30	0.30	0.30	0.40	0.30			
Date Sampled	17-Mar-23	16-Mar-23	16-Feb-23	16-Mar-24	16-Feb-24	16-Mar-25	16-Feb-25			
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES			
Sample Matrix Code	4AB	4AE	4AE	4AE	4AE	4AE	4AE			
Asbestos in Soil (inc. matrix) ^A										
Asbestos in soil ₀ ^B	NAD	NAD	NAD	NAD	NAD	NAD	NAD			A-T-045
Asbestos Matrix (visual) ₀	-	-	-	-	-	-	-			A-T-045
Asbestos Matrix (microscope) ₀	-	-	-	-	-	-	-			A-T-045
Asbestos ACM - Suitable for Water Absorption Test? ₀	N/A	N/A	N/A	N/A	N/A	N/A	N/A			A-T-045

Envirolab Job Number: 23/02978

Client Project Name: Gravesham Leisure Centre

Client Project Ref: 52511

Lab Sample ID	23/02978/1	23/02978/2	23/02978/3	23/02978/4	23/02978/5	23/02978/6	23/02978/7	Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	BH1	WS1	WS2	WS3	WS4	WS5	WS6			
Depth to Top	0.05	0.00	0.00	0.00	0.00	0.10	0.00			
Depth To Bottom		0.30	0.30	0.30	0.30	0.40	0.30			
Date Sampled	17-Mar-23	16-Mar-23	16-Feb-23	16-Mar-24	16-Feb-24	16-Mar-25	16-Feb-25			
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES			
Sample Matrix Code	4AB	4AE	4AE	4AE	4AE	4AE	4AE			
PAH-16MS										
Acenaphthene _A ^{MS}	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	0.02	mg/kg	0.01	A-T-019s
Acenaphthylene _A ^{MS}	<0.01	0.01	<0.01	<0.01	<0.01	0.04	<0.01	mg/kg	0.01	A-T-019s
Anthracene _A ^{MS}	<0.02	<0.02	<0.02	<0.02	<0.02	0.06	0.04	mg/kg	0.02	A-T-019s
Benzo(a)anthracene _A ^{MS}	<0.04	0.14	0.12	0.11	0.05	0.39	0.25	mg/kg	0.04	A-T-019s
Benzo(a)pyrene _A ^{MS}	<0.04	0.18	0.14	0.12	0.06	0.39	0.24	mg/kg	0.04	A-T-019s
Benzo(b)fluoranthene _A ^{MS}	<0.05	0.23	0.19	0.17	0.09	0.51	0.36	mg/kg	0.05	A-T-019s
Benzo(ghi)perylene _A ^{MS}	0.06	0.16	0.10	0.09	<0.05	0.24	0.14	mg/kg	0.05	A-T-019s
Benzo(k)fluoranthene _A ^{MS}	<0.07	<0.07	<0.07	<0.07	<0.07	0.19	0.12	mg/kg	0.07	A-T-019s
Chrysene _A ^{MS}	<0.06	0.17	0.16	0.15	0.08	0.46	0.36	mg/kg	0.06	A-T-019s
Dibenzo(ah)anthracene _A ^{MS}	<0.04	<0.04	<0.04	<0.04	<0.04	0.05	<0.04	mg/kg	0.04	A-T-019s
Fluoranthene _A ^{MS}	<0.08	0.26	0.30	0.26	0.14	0.89	0.78	mg/kg	0.08	A-T-019s
Fluorene _A ^{MS}	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	0.01	mg/kg	0.01	A-T-019s
Indeno(123-cd)pyrene _A ^{MS}	<0.03	0.16	0.10	0.10	0.04	0.26	0.14	mg/kg	0.03	A-T-019s
Naphthalene _A ^{MS}	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	mg/kg	0.03	A-T-019s
Phenanthrene _A ^{MS}	<0.03	0.07	0.11	0.09	0.05	0.32	0.39	mg/kg	0.03	A-T-019s
Pyrene _A ^{MS}	<0.07	0.25	0.26	0.22	0.13	0.76	0.66	mg/kg	0.07	A-T-019s
Total PAH-16MS _A ^{MS}	<0.08	1.63	1.48	1.31	0.64	4.58	3.51	mg/kg	0.01	A-T-019s

Envirolab Job Number: 23/02978

Client Project Name: Gravesham Leisure Centre

Client Project Ref: 52511

Lab Sample ID	23/02978/1	23/02978/2	23/02978/3	23/02978/4	23/02978/5	23/02978/6	23/02978/7	Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	BH1	WS1	WS2	WS3	WS4	WS5	WS6			
Depth to Top	0.05	0.00	0.00	0.00	0.00	0.10	0.00			
Depth To Bottom		0.30	0.30	0.30	0.30	0.40	0.30			
Date Sampled	17-Mar-23	16-Mar-23	16-Feb-23	16-Mar-24	16-Feb-24	16-Mar-25	16-Feb-25			
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES			
Sample Matrix Code	4AB	4AE	4AE	4AE	4AE	4AE	4AE			
VOC										
Dichlorodifluoromethane _A	<1	-	-	-	-	-	-	µg/kg	1	A-T-006a
Chloromethane _A	<10	-	-	-	-	-	-	µg/kg	10	A-T-006a
Vinyl Chloride (Chloroethene) _A [®]	<1	-	-	-	-	-	-	µg/kg	1	A-T-006a
Bromomethane _A [®]	<1	-	-	-	-	-	-	µg/kg	1	A-T-006a
Chloroethane _A [®]	<1	-	-	-	-	-	-	µg/kg	1	A-T-006a
Trichlorofluoromethane _A [®]	<1	-	-	-	-	-	-	µg/kg	1	A-T-006a
1,1-Dichloroethene _A [®]	<1	-	-	-	-	-	-	µg/kg	1	A-T-006a
Carbon Disulphide _A [®]	<1	-	-	-	-	-	-	µg/kg	1	A-T-006a
Dichloromethane _A	<5	-	-	-	-	-	-	µg/kg	5	A-T-006a
trans 1,2-Dichloroethene _A [®]	<1	-	-	-	-	-	-	µg/kg	1	A-T-006a
1,1-Dichloroethane _A [®]	<1	-	-	-	-	-	-	µg/kg	1	A-T-006a
cis 1,2-Dichloroethene _A [®]	<1	-	-	-	-	-	-	µg/kg	1	A-T-006a
2,2-Dichloropropane _A [®]	<1	-	-	-	-	-	-	µg/kg	1	A-T-006a
Bromochloromethane _A [®]	<5	-	-	-	-	-	-	µg/kg	5	A-T-006a
Chloroform _A [®]	<1	-	-	-	-	-	-	µg/kg	1	A-T-006a
1,1,1-Trichloroethane _A [®]	<1	-	-	-	-	-	-	µg/kg	1	A-T-006a
1,1-Dichloropropene _A [®]	<1	-	-	-	-	-	-	µg/kg	1	A-T-006a
Carbon Tetrachloride _A [®]	<1	-	-	-	-	-	-	µg/kg	1	A-T-006a
1,2-Dichloroethane _A [®]	<2	-	-	-	-	-	-	µg/kg	2	A-T-006a
Benzene _A [®]	<1	-	-	-	-	-	-	µg/kg	1	A-T-006a
Trichloroethene _A [®]	<1	-	-	-	-	-	-	µg/kg	1	A-T-006a
1,2-Dichloropropane _A [®]	<1	-	-	-	-	-	-	µg/kg	1	A-T-006a
Dibromomethane _A [®]	<1	-	-	-	-	-	-	µg/kg	1	A-T-006a
Bromodichloromethane _A [®]	<10	-	-	-	-	-	-	µg/kg	10	A-T-006a
cis 1,3-Dichloropropene _A [®]	<1	-	-	-	-	-	-	µg/kg	1	A-T-006a
Toluene _A [®]	<1	-	-	-	-	-	-	µg/kg	1	A-T-006a
trans 1,3-Dichloropropene _A [®]	<1	-	-	-	-	-	-	µg/kg	1	A-T-006a
1,1,2-Trichloroethane _A [®]	<1	-	-	-	-	-	-	µg/kg	1	A-T-006a
1,3-Dichloropropane _A [®]	<1	-	-	-	-	-	-	µg/kg	1	A-T-006a
Tetrachloroethene _A [®]	<1	-	-	-	-	-	-	µg/kg	1	A-T-006a
Dibromochloromethane _A [®]	<3	-	-	-	-	-	-	µg/kg	3	A-T-006a
1,2-Dibromoethane _A [®]	<1	-	-	-	-	-	-	µg/kg	1	A-T-006a

Envirolab Job Number: 23/02978

Client Project Name: Gravesham Leisure Centre

Client Project Ref: 52511

Lab Sample ID	23/02978/1	23/02978/2	23/02978/3	23/02978/4	23/02978/5	23/02978/6	23/02978/7	Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	BH1	WS1	WS2	WS3	WS4	WS5	WS6			
Depth to Top	0.05	0.00	0.00	0.00	0.00	0.10	0.00			
Depth To Bottom		0.30	0.30	0.30	0.30	0.40	0.30			
Date Sampled	17-Mar-23	16-Mar-23	16-Feb-23	16-Mar-24	16-Feb-24	16-Mar-25	16-Feb-25			
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES			
Sample Matrix Code	4AB	4AE	4AE	4AE	4AE	4AE	4AE			
Chlorobenzene _A [®]	<1	-	-	-	-	-	-	µg/kg	1	A-T-000s
1,1,1,2-Tetrachloroethane _A	<1	-	-	-	-	-	-	µg/kg	1	A-T-000s
Ethylbenzene _A [®]	<1	-	-	-	-	-	-	µg/kg	1	A-T-000s
m & p Xylene _A [®]	<1	-	-	-	-	-	-	µg/kg	1	A-T-000s
o-Xylene _A [®]	<1	-	-	-	-	-	-	µg/kg	1	A-T-000s
Styrene _A [®]	<1	-	-	-	-	-	-	µg/kg	1	A-T-000s
Bromoform _A [®]	<1	-	-	-	-	-	-	µg/kg	1	A-T-000s
Isopropylbenzene _A [®]	<1	-	-	-	-	-	-	µg/kg	1	A-T-000s
1,1,2,2-Tetrachloroethane _A	<1	-	-	-	-	-	-	µg/kg	1	A-T-000s
1,2,3-Trichloropropane _A [®]	<1	-	-	-	-	-	-	µg/kg	1	A-T-000s
Bromobenzene _A [®]	<1	-	-	-	-	-	-	µg/kg	1	A-T-000s
n-Propylbenzene _A [®]	<1	-	-	-	-	-	-	µg/kg	1	A-T-000s
2-Chlorotoluene _A [®]	<1	-	-	-	-	-	-	µg/kg	1	A-T-000s
1,3,5-Trimethylbenzene _A [®]	<1	-	-	-	-	-	-	µg/kg	1	A-T-000s
4-Chlorotoluene _A [®]	<1	-	-	-	-	-	-	µg/kg	1	A-T-000s
tert-Butylbenzene _A [®]	<2	-	-	-	-	-	-	µg/kg	2	A-T-000s
1,2,4-Trimethylbenzene _A [®]	<1	-	-	-	-	-	-	µg/kg	1	A-T-000s
sec-Butylbenzene _A [®]	<1	-	-	-	-	-	-	µg/kg	1	A-T-000s
4-Isopropyltoluene _A [®]	<1	-	-	-	-	-	-	µg/kg	1	A-T-000s
1,3-Dichlorobenzene _A	<1	-	-	-	-	-	-	µg/kg	1	A-T-000s
1,4-Dichlorobenzene _A [®]	<1	-	-	-	-	-	-	µg/kg	1	A-T-000s
n-Butylbenzene _A [®]	<1	-	-	-	-	-	-	µg/kg	1	A-T-000s
1,2-Dichlorobenzene _A [®]	<1	-	-	-	-	-	-	µg/kg	1	A-T-000s
1,2-Dibromo-3-chloropropane (DCBP) _A	<2	-	-	-	-	-	-	µg/kg	2	A-T-000s
1,2,4-Trichlorobenzene _A	<3	-	-	-	-	-	-	µg/kg	3	A-T-000s
Hexachlorobutadiene _A [®]	<1	-	-	-	-	-	-	µg/kg	1	A-T-000s
1,2,3-Trichlorobenzene _A	<3	-	-	-	-	-	-	µg/kg	3	A-T-000s

Envirolab Job Number: 23/02978

Client Project Name: Gravesham Leisure Centre

Client Project Ref: 52511

Lab Sample ID	23/02978/1	23/02978/2	23/02978/3	23/02978/4	23/02978/5	23/02978/6	23/02978/7	Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	BH1	WS1	WS2	WS3	WS4	WS5	WS6			
Depth to Top	0.05	0.00	0.00	0.00	0.00	0.10	0.00			
Depth To Bottom		0.30	0.30	0.30	0.30	0.40	0.30			
Date Sampled	17-Mar-23	16-Mar-23	16-Feb-23	16-Mar-24	16-Feb-24	16-Mar-25	16-Feb-25			
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES			
Sample Matrix Code	4AB	4AE	4AE	4AE	4AE	4AE	4AE			
TPH CWG with Clean Up										
Ali >C5-C6 _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/kg	0.01	A-T-022s
Ali >C6-C8 _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/kg	0.01	A-T-022s
Ali >C8-C10 _A	<10	<1	<1	<1	<1	<1	<1	mg/kg	1	A-T-055s
Ali >C10-C12 _A ^{MP}	<10	<1	<1	<1	<1	<1	<1	mg/kg	1	A-T-055s
Ali >C12-C16 _A ^{MP}	<10	<1	<1	<1	<1	<1	<1	mg/kg	1	A-T-055s
Ali >C16-C21 _A ^{MP}	<10	<1	<1	<1	<1	<1	1	mg/kg	1	A-T-055s
Ali >C21-C35 _A ^{MP}	84	14	10	9	6	7	59	mg/kg	1	A-T-055s
Total Aliphatics _A	84	14	10	9	6	7	60	mg/kg	1	Calc-As Recd
Aro >C5-C7 _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/kg	0.01	A-T-022s
Aro >C7-C8 _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/kg	0.01	A-T-022s
Aro >C8-C10 _A	<10	<1	<1	<1	<1	<1	<1	mg/kg	1	A-T-055s
Aro >C10-C12 _A	<10	<1	<1	<1	<1	<1	<1	mg/kg	1	A-T-055s
Aro >C12-C16 _A	<10	<1	1	<1	<1	2	4	mg/kg	1	A-T-055s
Aro >C16-C21 _A ^{MP}	<10	2	4	4	1	18	20	mg/kg	1	A-T-055s
Aro >C21-C35 _A ^{MP}	53	11	17	16	8	61	57	mg/kg	1	A-T-055s
Total Aromatics _A	53	13	22	20	9	81	81	mg/kg	1	Calc-As Recd
TPH (Ali & Aro >C5-C35) _A	137	27	32	28	16	88	141	mg/kg	1	Calc-As Recd
BTEX - Benzene _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/kg	0.01	A-T-022s
BTEX - Toluene _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/kg	0.01	A-T-022s
BTEX - Ethyl Benzene _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/kg	0.01	A-T-022s
BTEX - m & p Xylene _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/kg	0.01	A-T-022s
BTEX - o Xylene _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/kg	0.01	A-T-022s
MTBE _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/kg	0.01	A-T-022s

Envirolab Job Number: 23/02978

Client Project Name: Gravesham Leisure Centre

Client Project Ref: 52511

Lab Sample ID	23/02978/8	23/02978/9	23/02978/10	23/02978/11	23/02978/12	23/02978/13	23/02978/14	Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	SA1	SA2	SA2	SA3	TP1	TP2	HP1			
Depth to Top	0.00	0.00	0.20	0.00	0.00	0.00	0.00			
Depth To Bottom	0.20	0.20	0.40	0.30	0.30	0.10	0.30			
Date Sampled	20-Mar-23	20-Mar-23	20-Mar-23	21-Mar-23	21-Mar-23	21-Mar-23	24-Mar-23			
Sample Type	Soil - ES	Solid	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES			
Sample Matrix Code	4ABE	7	4ABE	4AE	4AE	4AE	4ABE			
% Moisture at <40C _A	13.1	7.4	11.0	-	-	-	-	% w/w	0.1	A-T-044
% Stones >10mm _A	3.1	<0.1	15.5	<0.1	2.3	<0.1	<0.1	% w/w	0.1	A-T-044
pH ₀ ^{MS}	8.64	8.91	8.59	7.98	6.90	7.24	8.14	pH	0.01	A-T-031s
Sulphate (water sol 2:1) ₀ ^{MS}	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	g/l	0.01	A-T-025s
Sulphate (acid soluble) ₀ ^{MS}	580	360	1300	510	520	580	570	mg/kg	200	A-T-028s
Total Organic Carbon ₀ ^{MS}	11.4	-	3.68	1.80	-	2.90	-	% w/w	0.03	A-T-032s
Arsenic ₀ ^{MS}	10	<1	3	8	8	6	7	mg/kg	1	A-T-024s
Cadmium ₀ ^{MS}	2.4	0.6	1.5	0.7	1.2	1.0	2.7	mg/kg	0.5	A-T-024s
Copper ₀ ^{MS}	84	63	36	16	15	17	115	mg/kg	1	A-T-024s
Chromium ₀ ^{MS}	28	20	41	23	36	23	36	mg/kg	1	A-T-024s
Chromium (hexavalent) ₀	<1	<1	<1	-	-	-	-	mg/kg	1	A-T-040s
Lead ₀ ^{MS}	114	15	90	43	35	26	229	mg/kg	1	A-T-024s
Mercury ₀	2.17	1.45	1.85	<0.17	<0.17	<0.17	1.99	mg/kg	0.17	A-T-024s
Nickel ₀ ^{MS}	35	36	29	15	26	18	29	mg/kg	1	A-T-024s
Selenium ₀ ^{MS}	<1	<1	<1	<1	<1	<1	<1	mg/kg	1	A-T-024s
Zinc ₀ ^{MS}	157	35	94	77	100	69	464	mg/kg	5	A-T-024s

Envirolab Job Number: 23/02978

Client Project Name: Gravesham Leisure Centre

Client Project Ref: 52511

Lab Sample ID	23/02978/8	23/02978/9	23/02978/10	23/02978/11	23/02978/12	23/02978/13	23/02978/14	Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	SA1	SA2	SA2	SA3	TP1	TP2	HP1			
Depth to Top	0.00	0.00	0.20	0.00	0.00	0.00	0.00			
Depth To Bottom	0.20	0.20	0.40	0.30	0.30	0.10	0.30			
Date Sampled	20-Mar-23	20-Mar-23	20-Mar-23	21-Mar-23	21-Mar-23	21-Mar-23	24-Mar-23			
Sample Type	Soil - ES	Solid	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES			
Sample Matrix Code	4ABE	7	4ABE	4AE	4AE	4AE	4ABE			
Asbestos in Soil (inc. matrix) ^A										
Asbestos in soil ₀ ^B	NAD	NAD	NAD	NAD	NAD	NAD	NAD			A-T-045
Asbestos Matrix (visual) ₀	-	-	-	-	-	-	-			A-T-045
Asbestos Matrix (microscope) ₀	-	-	-	-	-	-	-			A-T-045
Asbestos ACM - Suitable for Water Absorption Test? ₀	N/A	N/A	N/A	N/A	N/A	N/A	N/A			A-T-045

Envirolab Job Number: 23/02978

Client Project Name: Gravesham Leisure Centre

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Lab Sample ID	23/02978/8	23/02978/9	23/02978/10	23/02978/11	23/02978/12	23/02978/13	23/02978/14	Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	SA1	SA2	SA2	SA3	TP1	TP2	HP1			
Depth to Top	0.00	0.00	0.20	0.00	0.00	0.00	0.00			
Depth To Bottom	0.20	0.20	0.40	0.30	0.30	0.10	0.30			
Date Sampled	20-Mar-23	20-Mar-23	20-Mar-23	21-Mar-23	21-Mar-23	21-Mar-23	24-Mar-23			
Sample Type	Soil - ES	Solid	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES			
Sample Matrix Code	4ABE	7	4ABE	4AE	4AE	4AE	4ABE			
PAH-16MS										
Acenaphthene _A ^{MS}	0.32	0.42	1.08	<0.01	<0.01	<0.01	0.07	mg/kg	0.01	A-T-019a
Acenaphthylene _A ^{MS}	0.14	0.70	0.27	<0.01	<0.01	<0.01	0.04	mg/kg	0.01	A-T-019a
Anthracene _A ^{MS}	1.36	2.39	3.71	0.02	<0.02	<0.02	0.30	mg/kg	0.02	A-T-019a
Benzo(a)anthracene _A ^{MS}	2.94	6.29	11.1	0.18	0.05	0.06	1.31	mg/kg	0.04	A-T-019a
Benzo(a)pyrene _A ^{MS}	2.67	4.19	7.89	0.17	0.05	0.06	1.04	mg/kg	0.04	A-T-019a
Benzo(b)fluoranthene _A ^{MS}	3.37	5.43	9.12	0.23	0.07	0.09	1.32	mg/kg	0.05	A-T-019a
Benzo(ghi)perylene _A ^{MS}	1.54	2.55	3.85	0.11	<0.05	<0.05	0.57	mg/kg	0.05	A-T-019a
Benzo(k)fluoranthene _A ^{MS}	1.09	1.86	3.37	0.08	<0.07	<0.07	0.42	mg/kg	0.07	A-T-019a
Chrysene _A ^{MS}	2.95	5.87	10	0.21	<0.06	0.08	1.28	mg/kg	0.06	A-T-019a
Dibenzo(ah)anthracene _A ^{MS}	0.31	0.59	0.88	<0.04	<0.04	<0.04	0.12	mg/kg	0.04	A-T-019a
Fluoranthene _A ^{MS}	8.15	14.6	27	0.41	0.12	0.13	3.07	mg/kg	0.08	A-T-019a
Fluorene _A ^{MS}	0.47	0.51	0.89	<0.01	<0.01	<0.01	0.08	mg/kg	0.01	A-T-019a
Indeno(123-cd)pyrene _A ^{MS}	1.73	2.89	4.64	0.11	<0.03	0.05	0.67	mg/kg	0.03	A-T-019a
Naphthalene _A ^{MS}	0.03	0.04	0.09	<0.03	<0.03	<0.03	0.14	mg/kg	0.03	A-T-019a
Phenanthrene _A ^{MS}	5.93	8.28	16.1	0.13	0.04	0.05	1.46	mg/kg	0.03	A-T-019a
Pyrene _A ^{MS}	6.77	13.5	23.3	0.36	0.11	0.11	2.56	mg/kg	0.07	A-T-019a
Total PAH-16MS _A ^{MS}	39.8	70.1	123	2.01	0.44	0.63	14.4	mg/kg	0.01	A-T-019a

Envirolab Job Number: 23/02978

Client Project Name: Gravesham Leisure Centre

Client Project Ref: 52511

Lab Sample ID	23/02978/8	23/02978/9	23/02978/10	23/02978/11	23/02978/12	23/02978/13	23/02978/14	Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	SA1	SA2	SA2	SA3	TP1	TP2	HP1			
Depth to Top	0.00	0.00	0.20	0.00	0.00	0.00	0.00			
Depth To Bottom	0.20	0.20	0.40	0.30	0.30	0.10	0.30			
Date Sampled	20-Mar-23	20-Mar-23	20-Mar-23	21-Mar-23	21-Mar-23	21-Mar-23	24-Mar-23			
Sample Type	Soil - ES	Solid	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES			
Sample Matrix Code	4ABE	7	4ABE	4AE	4AE	4AE	4ABE			
TPH Total with ID + GC Trace										
TPH total (>C6-C40) _A ^{MS}	384	1560	1990	-	-	-	-	mg/kg	10	A-T-007x
TPH FID Chromatogram _A	Appended	Appended	Appended	-	-	-	-			A-T-007x
TPH ID Interpretation _A	C12-C44 with some PAHs and other unknown hydrocarbons	C10-C44 with some PAHs and other unknown hydrocarbons	C10-C44 with some PAHs and other unknown hydrocarbons	-	-	-	-			A-T-007x

Envirolab Job Number: 23/02978

Client Project Name: Gravesham Leisure Centre

Client Project Ref: 52511

Lab Sample ID	23/02978/8	23/02978/9	23/02978/10	23/02978/11	23/02978/12	23/02978/13	23/02978/14	Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	SA1	SA2	SA2	SA3	TP1	TP2	HP1			
Depth to Top	0.00	0.00	0.20	0.00	0.00	0.00	0.00			
Depth To Bottom	0.20	0.20	0.40	0.30	0.30	0.10	0.30			
Date Sampled	20-Mar-23	20-Mar-23	20-Mar-23	21-Mar-23	21-Mar-23	21-Mar-23	24-Mar-23			
Sample Type	Soil - ES	Solid	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES			
Sample Matrix Code	4ABE	7	4ABE	4AE	4AE	4AE	4ABE			
TPH CWG with Clean Up										
Ali >C5-C6 _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/kg	0.01	A-T-022s
Ali >C6-C8 _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/kg	0.01	A-T-022s
Ali >C8-C10 _A	<10	<10	<10	<1	<1	<1	<1	mg/kg	1	A-T-055s
Ali >C10-C12 _A ^{MP}	<10	<10	<10	<1	<1	<1	<1	mg/kg	1	A-T-055s
Ali >C12-C16 _A ^{MP}	<10	<10	<10	<1	<1	<1	<1	mg/kg	1	A-T-055s
Ali >C16-C21 _A ^{MP}	<10	<10	11	1	<1	<1	2	mg/kg	1	A-T-055s
Ali >C21-C35 _A ^{MP}	103	253	78	12	6	9	200	mg/kg	1	A-T-055s
Total Aliphatics _A	103	253	89	13	6	9	203	mg/kg	1	Calc-Ac Recd
Aro >C5-C7 _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/kg	0.01	A-T-022s
Aro >C7-C8 _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/kg	0.01	A-T-022s
Aro >C8-C10 _A	<10	<10	<10	<1	<1	<1	<1	mg/kg	1	A-T-055s
Aro >C10-C12 _A	<10	<10	<10	<1	<1	<1	<1	mg/kg	1	A-T-055s
Aro >C12-C16 _A	20	13	108	2	<1	<1	8	mg/kg	1	A-T-055s
Aro >C16-C21 _A ^{MP}	77	58	801	6	2	3	110	mg/kg	1	A-T-055s
Aro >C21-C35 _A ^{MP}	282	242	1510	16	11	6	308	mg/kg	1	A-T-055s
Total Aromatics _A	379	313	2420	24	13	9	426	mg/kg	1	Calc-Ac Recd
TPH (Ali & Aro >C5-C35) _A	482	566	2510	37	19	18	629	mg/kg	1	Calc-Ac Recd
BTEX - Benzene _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/kg	0.01	A-T-022s
BTEX - Toluene _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/kg	0.01	A-T-022s
BTEX - Ethyl Benzene _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/kg	0.01	A-T-022s
BTEX - m & p Xylene _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/kg	0.01	A-T-022s
BTEX - o Xylene _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/kg	0.01	A-T-022s
MTBE _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/kg	0.01	A-T-022s

Envirolab Job Number: 23/02978

Client Project Name: Gravesham Leisure Centre

Client Project Ref: 52511

Lab Sample ID	23/02978/15	23/02978/16	23/02978/17	23/02978/18				Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	HP2	HP3	HP4	HP5						
Depth to Top	0.00	0.20	0.00	0.00						
Depth To Bottom	0.30	0.40	0.30	0.30						
Date Sampled	24-Mar-23	23-Feb-23	23-Mar-23	23-Mar-23						
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES						
Sample Matrix Code	4AE	4AE	4ABE	4ABE						
% Stones >10mm _A	<0.1	15.1	9.6	10.9				% w/w	0.1	A-T-044
pH ₀ ^{MS}	7.70	9.69	8.54	8.39				pH	0.01	A-T-031s
Sulphate (water sol 2:1) ₀ ^{MS}	<0.01	<0.01	0.04	0.04				g/l	0.01	A-T-026s
Sulphate (acid soluble) ₀ ^{MS}	730	1100	700	540				mg/kg	200	A-T-028s
Arsenic ₀ ^{MS}	4	7	5	6				mg/kg	1	A-T-024s
Cadmium ₀ ^{MS}	2.6	2.0	1.4	1.9				mg/kg	0.5	A-T-034s
Copper ₀ ^{MS}	42	16	76	38				mg/kg	1	A-T-024s
Chromium ₀ ^{MS}	29	21	21	117				mg/kg	1	A-T-024s
Lead ₀ ^{MS}	67	161	33	108				mg/kg	1	A-T-024s
Mercury ₀	0.36	1.39	1.15	1.24				mg/kg	0.17	A-T-024s
Nickel ₀ ^{MS}	23	16	19	19				mg/kg	1	A-T-024s
Selenium ₀ ^{MS}	<1	<1	<1	<1				mg/kg	1	A-T-024s
Zinc ₀ ^{MS}	327	182	116	323				mg/kg	5	A-T-024s

Envirolab Job Number: 23/02978

Client Project Name: Gravesham Leisure Centre

Client Project Ref: 52511

Lab Sample ID	23/02978/15	23/02978/16	23/02978/17	23/02978/18				Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	HP2	HP3	HP4	HP5						
Depth to Top	0.00	0.20	0.00	0.00						
Depth To Bottom	0.30	0.40	0.30	0.30						
Date Sampled	24-Mar-23	23-Feb-23	23-Mar-23	23-Mar-23						
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES						
Sample Matrix Code	4AE	4AE	4ABE	4ABE						
Asbestos in Soil (inc. matrix) ^A										
Asbestos in soil ^B	NAD	NAD	NAD	NAD						A-T-045
Asbestos Matrix (visual) ₀	-	-	-	-						A-T-045
Asbestos Matrix (microscope) ₀	-	-	-	-						A-T-045
Asbestos ACM - Suitable for Water Absorption Test? ₀	N/A	N/A	N/A	N/A						A-T-045

Envirolab Job Number: 23/02978

Client Project Name: Gravesham Leisure Centre

Client Project Ref: 52511

Lab Sample ID	23/02978/15	23/02978/16	23/02978/17	23/02978/18				Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	HP2	HP3	HP4	HP5						
Depth to Top	0.00	0.20	0.00	0.00						
Depth To Bottom	0.30	0.40	0.30	0.30						
Date Sampled	24-Mar-23	23-Feb-23	23-Mar-23	23-Mar-23						
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES						
Sample Matrix Code	4AE	4AE	4ABE	4ABE						
PAH-16MS										
Acenaphthene _A ^{MS}	<0.01	<0.01	0.03	0.04				mg/kg	0.01	A-T-019a
Acenaphthylene _A ^{MS}	<0.01	<0.01	<0.01	0.03				mg/kg	0.01	A-T-019a
Anthracene _A ^{MS}	<0.02	0.03	0.05	0.11				mg/kg	0.02	A-T-019a
Benzo(a)anthracene _A ^{MS}	0.07	0.09	0.18	0.87				mg/kg	0.04	A-T-019a
Benzo(a)pyrene _A ^{MS}	0.07	0.11	0.16	1.02				mg/kg	0.04	A-T-019a
Benzo(b)fluoranthene _A ^{MS}	0.11	0.14	0.22	1.42				mg/kg	0.05	A-T-019a
Benzo(ghi)perylene _A ^{MS}	<0.05	0.10	0.11	0.89				mg/kg	0.05	A-T-019a
Benzo(k)fluoranthene _A ^{MS}	<0.07	<0.07	0.08	0.54				mg/kg	0.07	A-T-019a
Chrysene _A ^{MS}	0.11	0.10	0.21	1.19				mg/kg	0.06	A-T-019a
Dibenzo(ah)anthracene _A ^{MS}	<0.04	<0.04	<0.04	0.13				mg/kg	0.04	A-T-019a
Fluoranthene _A ^{MS}	0.21	0.17	0.44	2.48				mg/kg	0.08	A-T-019a
Fluorene _A ^{MS}	<0.01	<0.01	0.02	0.02				mg/kg	0.01	A-T-019a
Indeno(123-cd)pyrene _A ^{MS}	0.05	0.10	0.12	0.86				mg/kg	0.03	A-T-019a
Naphthalene _A ^{MS}	<0.03	<0.03	<0.03	<0.03				mg/kg	0.03	A-T-019a
Phenanthrene _A ^{MS}	0.10	0.08	0.27	0.72				mg/kg	0.03	A-T-019a
Pyrene _A ^{MS}	0.19	0.15	0.39	2.23				mg/kg	0.07	A-T-019a
Total PAH-16MS _A ^{MS}	0.91	1.07	2.28	12.6				mg/kg	0.01	A-T-019a

Envirolab Job Number: 23/02978

Client Project Name: Gravesham Leisure Centre

Client Project Ref: 52511

Lab Sample ID	23/02978/15	23/02978/16	23/02978/17	23/02978/18				Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	HP2	HP3	HP4	HP5						
Depth to Top	0.00	0.20	0.00	0.00						
Depth To Bottom	0.30	0.40	0.30	0.30						
Date Sampled	24-Mar-23	23-Feb-23	23-Mar-23	23-Mar-23						
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES						
Sample Matrix Code	4AE	4AE	4ABE	4ABE						
Speciated PCB-EC7 & WHO12										
PCB BZ 28 _A ^{MS}	<0.003	-	-	-				mg/kg	0.003	A-T-004s
PCB BZ 52 _A ^{MS}	<0.002	-	-	-				mg/kg	0.002	A-T-004s
PCB BZ 81 _A ^{MS}	<0.005	-	-	-				mg/kg	0.005	A-T-004s
PCB BZ 101 _A ^{MS}	<0.004	-	-	-				mg/kg	0.004	A-T-004s
PCB BZ 105 _A ^{MS}	<0.005	-	-	-				mg/kg	0.005	A-T-004s
PCB BZ 114 _A ^{MS}	<0.005	-	-	-				mg/kg	0.005	A-T-004s
PCB BZ 118 _A ^{MS}	<0.007	-	-	-				mg/kg	0.007	A-T-004s
PCB BZ 123 _A ^{MS}	<0.005	-	-	-				mg/kg	0.005	A-T-004s
PCB BZ 126 _A ^{MS}	<0.005	-	-	-				mg/kg	0.005	A-T-004s
PCB BZ 138 _A ^{MS}	<0.006	-	-	-				mg/kg	0.006	A-T-004s
PCB BZ 153 _A ^{MS}	<0.004	-	-	-				mg/kg	0.004	A-T-004s
PCB BZ 156 _A ^{MS}	<0.005	-	-	-				mg/kg	0.005	A-T-004s
PCB BZ 157 _A ^{MS}	<0.005	-	-	-				mg/kg	0.005	A-T-004s
PCB BZ 167 _A ^{MS}	<0.005	-	-	-				mg/kg	0.005	A-T-004s
PCB BZ 169 _A ^{MS}	<0.005	-	-	-				mg/kg	0.005	A-T-004s
PCB BZ 180 _A ^{MS}	<0.004	-	-	-				mg/kg	0.004	A-T-004s
PCB BZ 189 _A ^{MS}	<0.005	-	-	-				mg/kg	0.005	A-T-004s
PCB BZ 77 _A ^{MS}	<0.005	-	-	-				mg/kg	0.005	A-T-004s
Total Speciated PCB-EC7 & WHO12 _A ^{MS}	<0.007	-	-	-				mg/kg	0.003	A-T-004s

Envirolab Job Number: 23/02978

Client Project Name: Gravesham Leisure Centre

Client Project Ref: 52511

Lab Sample ID	23/02978/15	23/02978/16	23/02978/17	23/02978/18				Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	HP2	HP3	HP4	HP5						
Depth to Top	0.00	0.20	0.00	0.00						
Depth To Bottom	0.30	0.40	0.30	0.30						
Date Sampled	24-Mar-23	23-Feb-23	23-Mar-23	23-Mar-23						
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES						
Sample Matrix Code	4AE	4AE	4ABE	4ABE						
TPH CWG with Clean Up										
Ali >C5-C6 _A [#]	<0.01	<0.01	<0.01	<0.01				mg/kg	0.01	A-T-022s
Ali >C6-C8 _A [#]	<0.01	<0.01	<0.01	<0.01				mg/kg	0.01	A-T-022s
Ali >C8-C10 _A	<1	<1	<1	<1				mg/kg	1	A-T-055s
Ali >C10-C12 _A ^{MP}	<1	<1	<1	<1				mg/kg	1	A-T-055s
Ali >C12-C16 _A ^{MP}	<1	<1	<1	1				mg/kg	1	A-T-055s
Ali >C16-C21 _A ^{MP}	2	<1	<1	4				mg/kg	1	A-T-055s
Ali >C21-C35 _A ^{MP}	54	10	11	164				mg/kg	1	A-T-055s
Total Aliphatics _A	56	10	11	169				mg/kg	1	Calc-As Recd
Aro >C5-C7 _A [#]	<0.01	<0.01	<0.01	<0.01				mg/kg	0.01	A-T-022s
Aro >C7-C8 _A [#]	<0.01	<0.01	<0.01	<0.01				mg/kg	0.01	A-T-022s
Aro >C8-C10 _A	<1	<1	<1	2				mg/kg	1	A-T-055s
Aro >C10-C12 _A	<1	<1	<1	4				mg/kg	1	A-T-055s
Aro >C12-C16 _A	2	2	3	7				mg/kg	1	A-T-055s
Aro >C16-C21 _A ^{MP}	5	5	18	56				mg/kg	1	A-T-055s
Aro >C21-C35 _A ^{MP}	17	17	41	286				mg/kg	1	A-T-055s
Total Aromatics _A	25	24	62	355				mg/kg	1	Calc-As Recd
TPH (Ali & Aro >C5-C35) _A	81	34	73	524				mg/kg	1	Calc-As Recd
BTEX - Benzene _A [#]	<0.01	<0.01	<0.01	<0.01				mg/kg	0.01	A-T-022s
BTEX - Toluene _A [#]	<0.01	<0.01	<0.01	<0.01				mg/kg	0.01	A-T-022s
BTEX - Ethyl Benzene _A [#]	<0.01	<0.01	<0.01	<0.01				mg/kg	0.01	A-T-022s
BTEX - m & p Xylene _A [#]	<0.01	<0.01	<0.01	<0.01				mg/kg	0.01	A-T-022s
BTEX - o Xylene _A [#]	<0.01	<0.01	<0.01	<0.01				mg/kg	0.01	A-T-022s
MTBE _A [#]	<0.01	<0.01	<0.01	<0.01				mg/kg	0.01	A-T-022s

REPORT NOTES

General

This report shall not be reproduced, except in full, without written approval from Envirolab.

The results reported herein relate only to the material supplied to the laboratory.

The residue of any samples contained within this report, and any received with the same delivery, will be disposed of six weeks after initial scheduling. For samples tested for Asbestos we will retain a portion of the dried sample for a minimum of six months after the initial Asbestos testing is completed.

Analytical results reflect the quality of the sample at the time of analysis only.

Opinions and interpretations expressed are outside the scope of our accreditation.

If results are in italic font they are associated with an AQC failure, these are not accredited and are unreliable.

A deviating samples report is appended and will indicate if samples or tests have been found to be deviating. Any test results affected may not be an accurate record of the concentration at the time of sampling and, as a result, may be invalid.

The Client Sample No, Client Sample ID, Depth to Top, Depth to Bottom and Date Sampled were all provided by the client.

Soil chemical analysis:

All results are reported as dry weight (<40°C).

For samples with Matrix Codes 1 - 6 natural stones, brick and concrete fragments >10mm and any extraneous material (visible glass, metal or twigs) are removed and excluded from the sample prior to analysis and reported results corrected to a whole sample basis. This is reported as '% stones >10mm'.

For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis and this supersedes any "A" subscripts

All analysis is performed on the sample as received for soil samples which are positive for asbestos or the client has informed asbestos may be present and/or if they are from outside the European Union and this supersedes any "D" subscripts.

TPH analysis of water by method A-T-007:

Free and visible oils are excluded from the sample used for analysis so that the reported result represents the dissolved phase only.

Electrical Conductivity of water by Method A-T-037:

Results greater than 12900µS/cm @ 25°C / 11550µS/cm @ 20°C fall outside the calibration range and as such are unaccredited.

Asbestos:

Asbestos in soil analysis is performed on a dried aliquot of the submitted sample and cannot guarantee to identify asbestos if only present in small numbers as discrete fibres/fragments in the original sample.

Stones etc. are not removed from the sample prior to analysis.

Quantification of asbestos is a 3 stage process including visual identification, hand picking and weighing and fibre counting by sedimentation/phase contrast optical microscopy if required. If asbestos is identified as being present but is not in a form that is suitable for analysis by hand picking and weighing (normally if the asbestos is present as free fibres) quantification by sedimentation is performed. Where ACMs are found a percentage asbestos is assigned to each with reference to 'HSG264, Asbestos: The survey guide' and the calculated asbestos content is expressed as a percentage of the dried soil sample aliquot used.

Predominant Matrix Codes:

1 = SAND, 2 = LOAM, 3 = CLAY, 4 = LOAM/SAND, 5 = SAND/CLAY, 6 = CLAY/LOAM, 7 = OTHER, 8 = Asbestos bulk ID sample, 9 = INCINERATOR ASH.

Samples with Matrix Code 7 & 8 are not predominantly a SAND/LOAM/CLAY mix and are not covered by our BSEN 17025 or MCERTS accreditations, with the exception of bulk asbestos which are BSEN 17025 accredited.

Secondary Matrix Codes:

A = contains stones, B = contains construction rubble, C = contains visible hydrocarbons, D = contains glass/metal,

E = contains roots/twigs.

Key:

IS Indicates Insufficient Sample for analysis.

US indicates Unsuitable Sample for analysis.

NDP indicates No Determination Possible.

NAD indicates No Asbestos Detected.

N/A indicates Not Applicable.

Superscript # indicates method accredited to ISO 17025.

Superscript "M" indicates method accredited to MCERTS.

Subscript "A" indicates analysis performed on the sample as received.

Subscript "D" indicates analysis performed on the dried sample, crushed to pass a 2mm sieve

Subscript "A" indicates analysis has dependant options against results. Testing dependant on results appear in the comments area of your sample receipt.

EPH CWG results have humics mathematically subtracted through instrument calculation

TPH results "with Cleanup" indicates results cleaned up with Silica during extraction

EPH CWG GCxGC ID from TPH CWG

Where we have identified humic substances in any ID's from TPH CWG with Clean Up please note that the concentration of these humic substances is not included in the quantified results and are included in the ID for information.

Please contact us if you need any further information.

v2

Envirolab Deviating Samples Report

Units 7&8 Sandpits Business Park, Mottram Road, Hyde, SK14 3AR
Tel. 0161 368 4921 email. ask@envlab.co.uk

Client: RSK Environment Ltd Tonbridge, Anerley Court, Half Moon Lane,
Hildenborough, Tonbridge, Kent, TN11 9HU

Project: Gravesham Leisure Centre

Clients Project No: 52511

Project No: 23/02978

Date Received: 29/03/2023 (am)

Cool Box Temperatures (°C): 10.4 & 10.7

Lab Sample ID	23/02978/3	23/02978/16
Client Sample No		
Client Sample ID/Depth	WS2 0.00-0.30m	HP3 0.20-0.40m
Date Sampled	16/02/23	23/02/23
Deviation Code		
F	✓	✓

Key

F Maximum holding time exceeded between sampling date and analysis for analytes listed below

HOLDING TIME EXCEEDANCES

Lab Sample ID	23/02978/3	23/02978/16
Client Sample No		
Client Sample ID/Depth	WS2 0.00-0.30m	HP3 0.20-0.40m
Date Sampled	16/02/23	23/02/23
PAH-16MS	✓	✓
Sulphate (acid soluble)	✓	✓
Sulphate (water sol 2:1)	✓	✓
EPHCWG	✓	✓
VPHCWG	✓	✓

If, at any point before reaching the laboratory, the temperature of the samples has breached those set in published standards, e.g. BS-EN 5667-3, ISO 18400-102:2017, then the concentration of any affected analytes may differ from that at the time of sampling.

Envirolab Analysis Dates

Lab Sample ID	23/02978/1	23/02978/2	23/02978/3	23/02978/4	23/02978/5	23/02978/6	23/02978/7	23/02978/8	23/02978/9	23/02978/10	23/02978/11	23/02978/12
Client Sample No												
Client Sample ID/Depth	BH1 0.05m	WS1 0.00-0.30m	WS2 0.00-0.30m	WS3 0.00-0.30m	WS4 0.00-0.30m	WS5 0.10-0.40m	WS6 0.00-0.30m	SA1 0.00-0.20m	SA2 0.00-0.20m	SA2 0.20-0.40m	SA3 0.00-0.30m	TP1 0.00-0.30m
Date Sampled	17/03/23	16/03/23	16/02/23	16/03/24	16/02/24	16/03/25	16/02/25	20/03/23	20/03/23	20/03/23	21/03/23	21/03/23
A-T-004s								03/04/2023		03/04/2023		
A-T-006s	03/04/2023											
A-T-007s								31/03/2023	31/03/2023	31/03/2023		
A-T-019s	06/04/2023	06/04/2023	06/04/2023	06/04/2023	06/04/2023	06/04/2023	06/04/2023	06/04/2023	06/04/2023	06/04/2023	06/04/2023	06/04/2023
A-T-022s	03/04/2023	03/04/2023	03/04/2023	03/04/2023	03/04/2023	03/04/2023	03/04/2023	03/04/2023	03/04/2023	03/04/2023	03/04/2023	03/04/2023
A-T-024s	07/04/2023	07/04/2023	07/04/2023	07/04/2023	07/04/2023	07/04/2023	07/04/2023	07/04/2023	07/04/2023	07/04/2023	07/04/2023	07/04/2023
A-T-025w								11/04/2023		11/04/2023		
A-T-026s	06/04/2023	06/04/2023	06/04/2023	06/04/2023	06/04/2023	06/04/2023	06/04/2023	06/04/2023	06/04/2023	06/04/2023	06/04/2023	06/04/2023
A-T-026w								11/04/2023		11/04/2023		
A-T-026w (F)								11/04/2023		11/04/2023		
A-T-028s	12/04/2023	12/04/2023	12/04/2023	12/04/2023	12/04/2023	12/04/2023	12/04/2023	12/04/2023	12/04/2023	12/04/2023	12/04/2023	12/04/2023
A-T-030s								07/04/2023		06/04/2023		
A-T-031s	11/04/2023	11/04/2023	11/04/2023	11/04/2023	11/04/2023	11/04/2023	11/04/2023	11/04/2023	11/04/2023	11/04/2023	11/04/2023	11/04/2023
A-T-031w								11/04/2023		11/04/2023		
A-T-032s		06/04/2023		06/04/2023			06/04/2023	11/04/2023		06/04/2023	06/04/2023	
A-T-032w								11/04/2023		11/04/2023		
A-T-037w								11/04/2023		11/04/2023		
A-T-040s	06/04/2023					06/04/2023		06/04/2023	06/04/2023	06/04/2023		
A-T-044	11/04/2023	11/04/2023	11/04/2023	11/04/2023	11/04/2023	11/04/2023	11/04/2023	11/04/2023	11/04/2023	11/04/2023	11/04/2023	11/04/2023
A-T-045	03/04/2023	03/04/2023	03/04/2023	03/04/2023	03/04/2023	03/04/2023	03/04/2023	03/04/2023	03/04/2023	03/04/2023	03/04/2023	03/04/2023
A-T-050w								11/04/2023		11/04/2023		
A-T-055s	06/04/2023	06/04/2023	06/04/2023	06/04/2023	06/04/2023	06/04/2023	06/04/2023	06/04/2023	06/04/2023	06/04/2023	06/04/2023	06/04/2023
A-T-ANCs								11/04/2023		11/04/2023		
Calc-As Recd	06/04/2023	06/04/2023	06/04/2023	06/04/2023	06/04/2023	06/04/2023	06/04/2023	06/04/2023	06/04/2023	06/04/2023	06/04/2023	06/04/2023
Calc-no stones								11/04/2023		11/04/2023		
Probe (w)								11/04/2023		11/04/2023		

Lab Sample ID	23/02978/13	23/02978/14	23/02978/15	23/02978/16	23/02978/17	23/02978/18
Client Sample No						
Client Sample ID/Depth	TP2 0.00-0.10m	HP1 0.00-0.30m	HP2 0.00-0.30m	HP3 0.20-0.40m	HP4 0.00-0.30m	HP5 0.00-0.30m
Date Sampled	21/03/23	24/03/23	24/03/23	23/02/23	23/03/23	23/03/23
A-T-004s			03/04/2023			
A-T-006s						
A-T-007s						
A-T-019s	06/04/2023	06/04/2023	06/04/2023	06/04/2023	06/04/2023	06/04/2023
A-T-022s	03/04/2023	03/04/2023	03/04/2023	03/04/2023	03/04/2023	03/04/2023
A-T-024s	07/04/2023	07/04/2023	07/04/2023	07/04/2023	07/04/2023	07/04/2023
A-T-025w						
A-T-026s	06/04/2023	06/04/2023	06/04/2023	06/04/2023	06/04/2023	06/04/2023
A-T-026w						
A-T-026w (F)						
A-T-028s	12/04/2023	12/04/2023	12/04/2023	12/04/2023	12/04/2023	12/04/2023
A-T-030s						
A-T-031s	11/04/2023	11/04/2023	11/04/2023	11/04/2023	11/04/2023	11/04/2023
A-T-031w						
A-T-032s	06/04/2023					
A-T-032w						
A-T-037w						
A-T-040s						
A-T-044	11/04/2023	11/04/2023	11/04/2023	11/04/2023	11/04/2023	11/04/2023
A-T-045	03/04/2023	03/04/2023	03/04/2023	03/04/2023	03/04/2023	03/04/2023
A-T-050w						
A-T-055s	06/04/2023	06/04/2023	06/04/2023	06/04/2023	06/04/2023	06/04/2023
A-T-ANCs						
Calc-As Recd	06/04/2023	06/04/2023	06/04/2023	06/04/2023	06/04/2023	06/04/2023
Calc-no stones						
Probe (w)						

The above dates are the analysis completion dates, please note that these are not necessarily the date that the analysis was weighed/extracted.

End of Report

Appendix I
LABORATORY CERTIFICATES FOR GEOTECHNICAL ANALYSIS



STRUCTURAL SOILS LTD

TEST REPORT



Report No. 584979-01 (00)

1774

Date 25-April-2023 Contract Gravesham Leisure Centre

Client RSK
Address Anerley Court
Half Moon Lane
Hildenborough
Tonbridge
TN11 9HU

For the Attention of Josh Curnow

Samples submitted by client	05-April-2023	Client Reference	52511
Method of sampling	Unknown	Client Order No.	n/a
Testing Started	11-April-2023	Instruction Type	Written
Testing Completed	21-April-2023		

Tests marked 'Not UKAS Accredited' in this report are not included in the UKAS Accreditation Schedule for our Laboratory.

UKAS Accredited Tests

P105	Water Content BS EN ISO 17892-1:2014
P106	Linear Density BS EN ISO 17892-2:2014
P114	Liquid and plastic limits BS EN ISO 17892-12:2018

Undertaken by a sub-contractor

2.04	Sulphate content (water extract) in accordance with BRE Special Digest 1:2005
2.07	pH value in accordance with BRE Special Digest 1:2005

* This clause of BS1377 is no longer the most up to date method due to the publication of ISO17892

Please Note: Remaining samples will be retained for a period of one month from today and will then be disposed of .

Test were undertaken on samples 'as received' unless otherwise stated.

Opinions and interpretations expressed in this report are outside the scope of accreditation for this laboratory.

Results relate only to items tested

This report shall not be reproduced except in full without written permission of SSL Laboratories

Structural Soils Ltd 18 Frogmore Rd Hemel Hempstead HP3 9RT Tel.01442 416661 e-mail dimitris.xirouchakis@soils.co.uk

TESTING VERIFICATION CERTIFICATE



1774

The test results included in this report are certified as:-

ISSUE STATUS: **FINAL**

In accordance with the Structural Soils Ltd Laboratory Quality Management System, results sheets and summaries of results issued by the laboratory are checked by an approved signatory. The integrity of the test data and results are ensured by control of the computer system employed by the laboratory as part of the Software Verification Program as detailed in the Laboratory Quality Manual.

This testing verification certificate covers all testing compiled on or before the following datetime: **25/04/2023 13:47:20**.

Testing reported after this date is not covered by this Verification Certificate.



Approved Signatory
Sharon Cairns (Laboratory Manager)

(Head Office)
Bristol Laboratory
Unit 1A, Princess Street
Bedminster
Bristol
BS3 4AG

Castleford Laboratory
The Potteries, Pottery Street
Castleford
West Yorkshire
WF10 1NJ

Hemel Laboratory
18 Frogmore Road
Hemel Hempstead
Hertfordshire
HP3 9RT

Tonbridge Laboratory
Anerley Court, Half Moon Lane
Hildenborough
Tonbridge
TN11 9HU



**STRUCTURAL
SOILS LTD**

Contract:

Gravesham Leisure Centre

Job No:

584979



SUMMARY OF SOIL CLASSIFICATION TESTS

In accordance with Part 1, Part 12 of BS EN ISO 17892

Exploratory Position ID	Sample Ref	Sample Type	Depth (m)	Water Content %	Liquid Limit %	Plastic Limit %	Plasticity Index	% <425um	Description of Sample
BH1		D	0.50	16.6	55	24	31	95	Orangish brown slightly gravelly slightly sandy CLAY
BH1		D	1.20	11.4	29	15	14	93	Brown mottled orange slightly gravelly slightly sandy CLAY with pockets of chalk
BH2		D	0.50	20.8	36	19	17	94	Orangish brown slightly gravelly sandy CLAY
BH2		D	1.75	23.7	NP	NP	NP	89	White slightly gravelly silty CHALK with bands of brown clay
BH3		D	0.50	17.4	36	20	16	88	Brown mottled orange slightly gravelly slightly sandy CLAY
BH3		D	1.20	28.0	50	20	30	90	Orangish brown slightly gravelly slightly sandy CLAY
WS1		D	0.80	14.8	44	20	24	87	Orangish brown slightly gravelly slightly sandy CLAY
WS3		D	0.70	19.6	33	17	16	81	Brown mottled orange slightly gravelly slightly sandy CLAY with chalk and flint

SYMBOLS: ' denotes BS 1377

 STRUCTURAL SOILS LTD	Contract: Gravesham Leisure Centre	Contract Ref: 584979 
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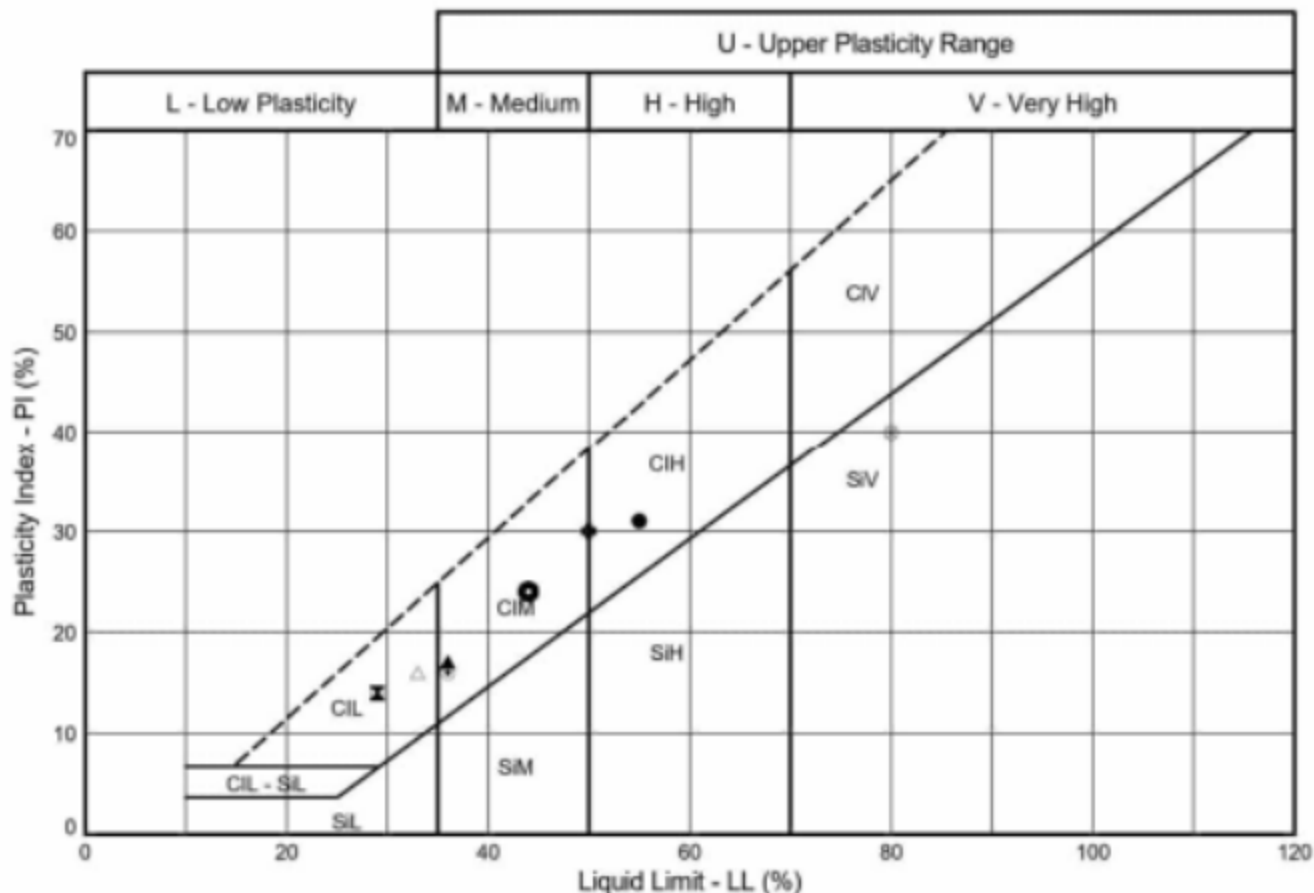
In accordance with Part 1, Part 12 of BS EN ISO 17892

SYMBOLS: * denotes BS 1377



PI vs LL CHART

According to BS EN 14688-2:2018
Testing in accordance with BS EN ISO 17892-12:2018+A1:2021



Sample Identification				Test Method #	Preparation Method +	WC %	LL %	PL %	PI %	<425µm %	Lab location	Notes
Exploratory Position ID	Sample	Depth (m)										
●	BH1	D	0.50	5.3.14/5.5/6.5	5.2.7	16.6	55	24	31	95	T	
⊗	BH1	D	1.20	5.3.14/5.5/6.5	5.2.7	11.4	29	15	14	93	T	
▲	BH2	D	0.50	5.3.14/5.5/6.5	5.2.7	20.8	36	19	17	94	T	
■	BH2	D	1.75	5.3.14/5.5/6.5	5.2.7	23.7	NP	NP	NP	89	T	
⊙	BH3	D	0.50	5.3.14/5.5/6.5	5.2.7	17.4	36	20	16	88	T	
⊕	BH3	D	1.20	5.3.14/5.5/6.5	5.2.7	28.0	50	20	30	90	T	
●	WS1	D	0.80	5.3.14/5.5/6.5	5.2.7	14.8	44	20	24	87	T	
△	WS3	D	0.70	5.3.14/5.5/6.5	5.2.7	19.6	33	17	16	81	T	
⊗	WS5	D	1.00	5.3.14/5.5/6.5	5.2.7	17.3	80	40	40	73	T	

Tested in accordance with the following clauses of BS EN ISO 17892-12:2018+A1:2021
5.3 - Cone Penetrometer Method; 5.3.14 - One-Point Cone Penetrometer Method; 5.4 - Casagrande Method; 5.5 - Plastic Limit Method; 6.5 - Plasticity Index

Water Content (WC) tested in accordance with BS EN ISO 17892-1:2014

* Tested in accordance with the following clauses of BS EN ISO 17892-12:2018+A1:2021
5.2.1 - Natural State and 5.2.7 - Wet Sieved

Key: * = Non-standard test, NP = Non plastic, I = Increasing WC, D = Decreasing WC.

Lab location: B = Bristol (BS3 4AG), C = Castleford (WF10 1NJ), H = Hemel Hempstead (HP3 9RT), T = Tonbridge (TN11 9HU)



STRUCTURAL SOILS
Anerley Court
Half Moon Lane
Hildenborough
Tonbridge TN11 9HU

Compiled By		Date
SHARON CAIRNS		25/04/23
Contract		Contract Ref:
Gravesham Leisure Centre		584979
		AGS

SUMMARY OF SATURATED MOISTURE CONTENT OF CHALK TESTS

In accordance with clause 3.3 of BS1377:Part 2:1990

Exploratory Position ID	Sample Ref	Sample Type	Depth (m)	Number of Lumps	Moisture Content %	Bulk Density Mg/m ³	Dry Density Mg/m ³	Saturated Moisture Content %	Description of Sample	Lab location
SA1		D	1.40	3	25*	1.82*	1.46*	32*	White CHALK	T
SA1		D	2.40	3	25*	1.80*	1.44*	32*	White CHALK	T
SA2		D	1.60	3	30*	1.86*	1.43*	33*	White CHALK	T
SA2		D	2.60	3	29*	1.86*	1.44*	32*	White CHALK	T
SA3		D	1.80	3	20*	1.75*	1.46*	31*	White CHALK	T
TP1		D	2.60	3	29*	1.86*	1.43*	33*	White CHALK	T
TP2		D	2.60	3	29*	1.90*	1.47*	31*	White CHALK with yellow mottling	T

* denotes the average values from multiple lumps

Lab location: B = Bristol (BS3 4AG), C = Castleford (WF10 1NJ), H = Hemel Hempstead (HP3 9RT), T = Tonbridge (TN11 9HU)

 STRUCTURAL SOILS Anerley Court Half Moon Lane Hildenborough Tonbridge TN11 9HU	Compiled By		Date	Contract Ref: 584979 
	Contract:		25.04.23	
	Gravesham Leisure Centre			

GNT_LIBRARY_V13_01_02B - L - SUMMARY OF SMC - ALL - 584979-GRAVESHAM LEISURE CENTRE-40K-02011.GPJ - 25/04/23 13:56 - SC1

FINAL ANALYTICAL TEST REPORT

Envirolab Job Number: 23/03427
Issue Number: 1 **Date:** 18 April, 2023

Client: Structural Soils Limited (Tonbridge Lab)
Anerley Court
Half Moon Lane
Hildenborough
Kent
UK
TN11 9HU

Project Manager: Hemel Lab/Richard Ashby
Project Name: Gravesham Leisure Centre
Project Ref: 52511
Order No: N/A
Date Samples Received: 12/04/23
Date Instructions Received: 12/04/23
Date Analysis Completed: 18/04/23

Approved by:



Gemma Berrisford
Client Manager

Envirolab Job Number: 23/03427

Client Project Name: Gravesham Leisure Centre

Client Project Ref: 52511

Lab Sample ID	23/03427/1	23/03427/2	23/03427/3	23/03427/4	23/03427/5	23/03427/6	23/03427/7	Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	BH1	BH1	BH1	BH1	BH2	BH2	BH2			
Depth to Top	3.00	8.00	13.50	18.00	5.00	10.50	15.00			
Depth To Bottom	3.45	8.45			5.45					
Date Sampled										
Sample Type	Solid	Solid	Solid	Solid	Solid	Solid	Solid			
Sample Matrix Code	7	7	7	7	7	7	7			
% Stones >10mm _A	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	% w/w	0.1	A-T-044
pH BRE ₀ ^{MF}	8.74	8.94	8.90	8.96	9.03	9.00	8.94	pH	0.01	A-T-031a
Sulphate BRE (water sol 2:1) ₀ ^{MF}	15	<10	<10	<10	<10	<10	25	mg/l	10	A-T-025a

Envirolab Job Number: 23/03427

Client Project Name: Gravesham Leisure Centre

Client Project Ref: 52511

Lab Sample ID	23/03427/8	23/03427/9	23/03427/10	23/03427/11				Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	BH3	BH3	BH3	TP2						
Depth to Top	10.50	15.50	20.00	0.60						
Depth To Bottom		15.95	20.45	1.00						
Date Sampled										
Sample Type	Solid	Solid	Solid	Soil - D						
Sample Matrix Code	7	7	7	5A						
% Stones >10mm _A	<0.1	<0.1	<0.1	5.7				% w/w	0.1	A-T-044
pH BRE _D ^{MF}	8.90	8.88	9.09	8.17				pH	0.01	A-T-031s
Sulphate BRE (water sol 2:1) _D ^{MF}	19	24	<10	<10				mg/l	10	A-T-026s

REPORT NOTES

General

This report shall not be reproduced, except in full, without written approval from Envirolab.

The results reported herein relate only to the material supplied to the laboratory.

The residue of any samples contained within this report, and any received with the same delivery, will be disposed of six weeks after initial scheduling. For samples tested for Asbestos we will retain a portion of the dried sample for a minimum of six months after the initial Asbestos testing is completed.

Analytical results reflect the quality of the sample at the time of analysis only.

Opinions and interpretations expressed are outside the scope of our accreditation.

If results are in italic font they are associated with an AQC failure, these are not accredited and are unreliable.

A deviating samples report is appended and will indicate if samples or tests have been found to be deviating. Any test results affected may not be an accurate record of the concentration at the time of sampling and, as a result, may be invalid.

The Client Sample No, Client Sample ID, Depth to Top, Depth to Bottom and Date Sampled were all provided by the client.

Soil chemical analysis:

All results are reported as dry weight (<40°C).

For samples with Matrix Codes 1 - 6 natural stones, brick and concrete fragments >10mm and any extraneous material (visible glass, metal or twigs) are removed and excluded from the sample prior to analysis and reported results corrected to a whole sample basis. This is reported as '% stones >10mm'.

For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis and this supersedes any "A" subscripts

All analysis is performed on the sample as received for soil samples which are positive for asbestos or the client has informed asbestos may be present and/or if they are from outside the European Union and this supersedes any "D" subscripts.

TPH analysis of water by method A-T-007:

Free and visible oils are excluded from the sample used for analysis so that the reported result represents the dissolved phase only.

Electrical Conductivity of water by Method A-T-037:

Results greater than 12900µS/cm @ 25°C / 11550µS/cm @ 20°C fall outside the calibration range and as such are unaccredited.

Asbestos:

Asbestos in soil analysis is performed on a dried aliquot of the submitted sample and cannot guarantee to identify asbestos if only present in small numbers as discrete fibres/fragments in the original sample.

Stones etc. are not removed from the sample prior to analysis.

Quantification of asbestos is a 3 stage process including visual identification, hand picking and weighing and fibre counting by sedimentation/phase contrast optical microscopy if required. If asbestos is identified as being present but is not in a form that is suitable for analysis by hand picking and weighing (normally if the asbestos is present as free fibres) quantification by sedimentation is performed. Where ACMs are found a percentage asbestos is assigned to each with reference to 'HSG264, Asbestos: The survey guide' and the calculated asbestos content is expressed as a percentage of the dried soil sample aliquot used.

Predominant Matrix Codes:

1 = SAND, 2 = LOAM, 3 = CLAY, 4 = LOAM/SAND, 5 = SAND/CLAY, 6 = CLAY/LOAM, 7 = OTHER, 8 = Asbestos bulk ID sample, 9 = INCINERATOR ASH.

Samples with Matrix Code 7 & 8 are not predominantly a SAND/LOAM/CLAY mix and are not covered by our BSEN 17025 or MCERTS accreditations, with the exception of bulk asbestos which are BSEN 17025 accredited.

Secondary Matrix Codes:

A = contains stones, B = contains construction rubble, C = contains visible hydrocarbons, D = contains glass/metal,

E = contains roots/twigs.

Key:

IS indicates Insufficient Sample for analysis.

US indicates Unsuitable Sample for analysis.

NDP indicates No Determination Possible.

NAD indicates No Asbestos Detected.

N/A indicates Not Applicable.

Superscript # indicates method accredited to ISO 17025.

Superscript "M" indicates method accredited to MCERTS.

Subscript "A" indicates analysis performed on the sample as received.

Subscript "D" indicates analysis performed on the dried sample, crushed to pass a 2mm sieve

Subscript "A" indicates analysis has dependant options against results. Testing dependant on results appear in the comments area of your sample receipt.

EPH CWG results have humics mathematically subtracted through instrument calculation

TPH results "with Cleanup" indicates results cleaned up with Silica during extraction

EPH CWG GCxGC ID from TPH CWG

Where we have identified humic substances in any ID's from TPH CWG with Clean Up please note that the concentration of these

humic substances is not included in the quantified results and are included in the ID for information.

Please contact us if you need any further information.

v2

Envirolab Deviating Samples Report

Units 7&8 Sandpits Business Park, Mottram Road, Hyde, SK14 3AR
Tel. 0161 368 4921 email. ask@envirolab.co.uk

Client: Structural Soils Limited (Tonbridge Lab), Anerley Court, Half Moon Lane,
Hildenborough, Kent, UK, TN11 9HU
Project: Gravesham Leisure Centre
Clients Project No: 52511

Project No: 23/03427
Date Received: 12/04/2023 (am)
Cool Box Temperatures (°C): 6.1

Lab Sample ID	23/03427/1	23/03427/2	23/03427/3	23/03427/4	23/03427/5	23/03427/6	23/03427/7	23/03427/8	23/03427/9	23/03427/10	23/03427/11
Client Sample No											
Client Sample ID/Depth	BH1 3.00-3.45m	BH1 8.00-8.45m	BH1 13.50m	BH1 18.00m	BH2 5.00-5.45m	BH2 10.50m	BH2 15.00m	BH3 10.50m	BH3 15.50-15.95m	BH3 20.00-20.45m	TP2 0.60-1.00m
Date Sampled											
Deviation Code											
E (no date)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Key
E (no date) No sampling date provided (all results affected if not provided)

If, at any point before reaching the laboratory, the temperature of the samples has breached those set in published standards, e.g. BS-EN 5667-3, ISO 18400-102:2017, then the concentration of any affected analytes may differ from that at the time of sampling.

Envirolab Analysis Dates

Lab Sample ID	23/03427/1	23/03427/2	23/03427/3	23/03427/4	23/03427/5	23/03427/6	23/03427/7	23/03427/8	23/03427/9	23/03427/10	23/03427/11
Client Sample No											
Client Sample ID/Depth	BH1 3.00-3.45m	BH1 8.00-8.45m	BH1 13.50m	BH1 18.00m	BH2 5.00-5.45m	BH2 10.50m	BH2 15.00m	BH3 10.50m	BH3 15.50-15.95m	BH3 20.00-20.45m	TP2 0.60-1.00m
Date Sampled											
A-T-026s	18/04/2023	18/04/2023	18/04/2023	18/04/2023	18/04/2023	18/04/2023	18/04/2023	18/04/2023	18/04/2023	18/04/2023	18/04/2023
A-T-031s	18/04/2023	18/04/2023	18/04/2023	18/04/2023	18/04/2023	18/04/2023	18/04/2023	18/04/2023	18/04/2023	18/04/2023	18/04/2023
A-T-044	18/04/2023	18/04/2023	18/04/2023	18/04/2023	18/04/2023	18/04/2023	18/04/2023	18/04/2023	18/04/2023	18/04/2023	18/04/2023

The above dates are the analysis completion dates, please note that these are not necessarily the date that the analysis was weighed/extracted.

End of Report



STRUCTURAL SOILS LTD

TEST REPORT



Report No. 584979-01 (00)

1774

Date 25-April-2023 Contract Gravesham Leisure Centre

Client RSK
Address Anerley Court
Half Moon Lane
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TN11 9HU

For the Attention of Josh Curnow

Samples submitted by client	05-April-2023	Client Reference	52511
Method of sampling	Unknown	Client Order No.	n/a
Testing Started	11-April-2023	Instruction Type	Written
Testing Completed	21-April-2023		

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Undertaken by a sub-contractor

2.04	Sulphate content (water extract) in accordance with BRE Special Digest 1:2005
2.07	pH value in accordance with BRE Special Digest 1:2005

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Please Note: Remaining samples will be retained for a period of one month from today and will then be disposed of .
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Results relate only to items tested

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Structural Soils Ltd 18 Frogmore Rd Hemel Hempstead HP3 9RT Tel.01442 416661 e-mail dimitris.xirouchakis@soils.co.uk

TESTING VERIFICATION CERTIFICATE



1774

The test results included in this report are certified as:-

ISSUE STATUS: **FINAL**

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This testing verification certificate covers all testing compiled on or before the following datetime: **25/04/2023 13:47:20**.

Testing reported after this date is not covered by this Verification Certificate.



Approved Signatory
Sharon Cairns (Laboratory Manager)

(Head Office)
Bristol Laboratory
Unit 1A, Princess Street
Bedminster
Bristol
BS3 4AG

Castleford Laboratory
The Potteries, Pottery Street
Castleford
West Yorkshire
WF10 1NJ

Hemel Laboratory
18 Frogmore Road
Hemel Hempstead
Hertfordshire
HP3 9RT

Tonbridge Laboratory
Anerley Court, Half Moon Lane
Hildenborough
Tonbridge
TN11 9HU



**STRUCTURAL
SOILS LTD**

Contract:

Gravesham Leisure Centre

Job No:

584979



SUMMARY OF SOIL CLASSIFICATION TESTS

In accordance with Part 1, Part 12 of BS EN ISO 17892

Exploratory Position ID	Sample Ref	Sample Type	Depth (m)	Water Content %	Liquid Limit %	Plastic Limit %	Plasticity Index	% <425um	Description of Sample
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BH2		D	0.50	20.8	36	19	17	94	Orangish brown slightly gravelly sandy CLAY
BH2		D	1.75	23.7	NP	NP	NP	89	White slightly gravelly silty CHALK with bands of brown clay
BH3		D	0.50	17.4	36	20	16	88	Brown mottled orange slightly gravelly slightly sandy CLAY
BH3		D	1.20	28.0	50	20	30	90	Orangish brown slightly gravelly slightly sandy CLAY
WS1		D	0.80	14.8	44	20	24	87	Orangish brown slightly gravelly slightly sandy CLAY
WS3		D	0.70	19.6	33	17	16	81	Brown mottled orange slightly gravelly slightly sandy CLAY with chalk and flint

SYMBOLS: * denotes BS 1377



**STRUCTURAL
SOILS LTD**

Contract:

Gravesham Leisure Centre

Contract Ref:

584979



In accordance with Part 1, Part 12 of BS EN ISO 17892

SYMBOLS: * denotes BS 1377



Gravesham Leisure Centre

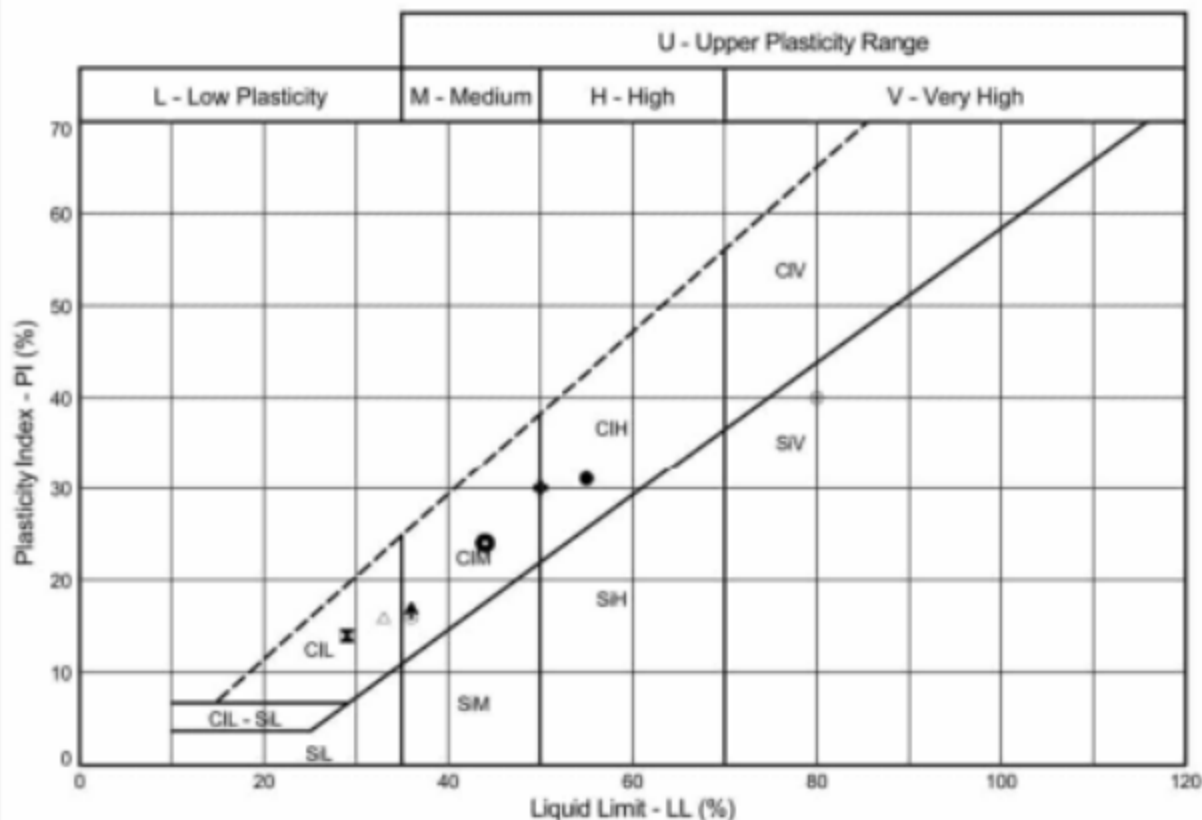
584979



PI vs LL CHART

According to BS EN 14688-2:2018

Testing in accordance with BS EN ISO 17892-12:2018+A1:2021



Sample Identification				Test Method #	Preparation Method +	WC %	LL %	PL %	PI %	<425µm %	Notes
Exploratory Position ID	Sample	Depth (m)									
●	BH1	D	0.50	5.3.14/5.5/6.5	5.2.7	16.6	55	24	31	95	T
✕	BH1	D	1.20	5.3.14/5.5/6.5	5.2.7	11.4	29	15	14	93	T
▲	BH2	D	0.50	5.3.14/5.5/6.5	5.2.7	20.8	36	19	17	94	T
	BH2	D	1.75	5.3.14/5.5/6.5	5.2.7	23.7	NP	NP	NP	89	T
⊙	BH3	D	0.50	5.3.14/5.5/6.5	5.2.7	17.4	36	20	16	88	T
⊙	BH3	D	1.20	5.3.14/5.5/6.5	5.2.7	28.0	50	20	30	90	T
⊙	WS1	D	0.80	5.3.14/5.5/6.5	5.2.7	14.8	44	20	24	87	T
△	WS3	D	0.70	5.3.14/5.5/6.5	5.2.7	10.6	33	17	16	81	T
⊙	WS5	D	1.00	5.3.14/5.5/6.5	5.2.7	17.3	80	40	40	73	T

Tested in accordance with the following clauses of BS EN ISO 17892-12:2018+A1:2021
 5.3 - Cone Penetrometer Method; 5.3.14 - One-Point Cone Penetrometer Method; 5.4 - Casagrande Method; 5.5 - Plastic Limit Method; 6.5 - Plasticity Index
 Water Content (WC) tested in accordance with BS EN ISO 17892-1:2014
 + Tested in accordance with the following clauses of BS EN ISO 17892-12:2018+A1:2021
 5.2.1 - Natural State and 5.2.7 - Wet Sieved
 Key: * = Non-standard test, NP = Non plastic, I = Increasing WC, D = Decreasing WC.

Lab location: B = Bristol (BS3 4AG), C = Castelford (WF10 1NU), H = Hemel Hempstead (HP3 9RT), T = Tonbridge (TN11 9HU)



STRUCTURAL SOILS
 Anerley Court
 Half Moon Lane
 Hildenborough
 Tonbridge TN11 9HU

Compiled By

Date

SHARON CAIRNS

25/04/23

Contract

Gravesham Leisure Centre

Contract Ref:

584979



SUMMARY OF SATURATED MOISTURE CONTENT OF CHALK TESTS

In accordance with clause 3.3 of BS1377:Part 2:1990

Exploratory Position ID	Sample Ref	Sample Type	Depth (m)	Number of Lumps	Moisture Content %	Bulk Density Mg/m ³	Dry Density Mg/m ³	Saturated Moisture Content %	Description of Sample	Lab location
SA1		D	1.40	3	25*	1.82*	1.46*	32*	White CHALK	T
SA1		D	2.40	3	25*	1.80*	1.44*	32*	White CHALK	T
SA2		D	1.60	3	30*	1.86*	1.43*	33*	White CHALK	T
SA2		D	2.60	3	29*	1.86*	1.44*	32*	White CHALK	T
SA3		D	1.80	3	20*	1.75*	1.46*	31*	White CHALK	T
TP1		D	2.60	3	29*	1.86*	1.43*	33*	White CHALK	T
TP2		D	2.60	3	29*	1.90*	1.47*	31*	White CHALK with yellow mottling	T

* denotes the average values from multiple lumps

Lab location: B = Bristol (BS3 4AG), C = Castleford (WF10 1NJ), H = Hemel Hempstead (HP3 9RT), T = Tonbridge (TN11 9HU)

	STRUCTURAL SOILS		Compiled By		Date	Contract Ref: 584979
	Anerley Court Half Moon Lane Hildenborough Tonbridge TN11 9HU		SHARON CAIRNS		25.04.23	
	Contract: 		Gravesham Leisure Centre			

QNT_LIBRARY_Y13_01.GLB: L - SUMMARY OF SMC - A4L: 584979-GRAVESHAM-LEISURE-CENTRE-40K-02011.GPJ: 25/04/23 12:08:30 C1:

FINAL ANALYTICAL TEST REPORT

Envirolab Job Number: 23/03427
Issue Number: 1
Date: 18 April, 2023

Client: Structural Soils Limited (Tonbridge Lab)
Anerley Court
Half Moon Lane
Hildenborough
Kent
UK
TN11 9HU

Project Manager: Hemel Lab/Richard Ashby
Project Name: Gravesham Leisure Centre
Project Ref: 52511
Order No: N/A
Date Samples Received: 12/04/23
Date Instructions Received: 12/04/23
Date Analysis Completed: 18/04/23

Approved by:



Gemma Berrisford
Client Manager

Envirolab Job Number: 23/03427

Client Project Name: Gravesham Leisure Centre

Client Project Ref: 52511

Lab Sample ID	23/03427/1	23/03427/2	23/03427/3	23/03427/4	23/03427/5	23/03427/6	23/03427/7	Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	BH1	BH1	BH1	BH1	BH2	BH2	BH2			
Depth to Top	3.00	8.00	13.50	18.00	5.00	10.50	15.00			
Depth To Bottom	3.45	8.45			5.45					
Date Sampled										
Sample Type	Solid	Solid	Solid	Solid	Solid	Solid	Solid			
Sample Matrix Code	7	7	7	7	7	7	7			
% Stones >10mm _A	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	% w/w	0.1	A-T-044
pH BRE ₀ ^{MS}	8.74	8.94	8.90	8.96	9.03	9.00	8.94	pH	0.01	A-T-031s
Sulphate BRE (water sol 2:1) ₀ ^{MS}	15	<10	<10	<10	<10	<10	25	mg/l	10	A-T-028s

Envirolab Job Number: 23/03427

Client Project Name: Gravesham Leisure Centre

Client Project Ref: 52511

Lab Sample ID	23/03427/8	23/03427/9	23/03427/10	23/03427/11				Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	BH3	BH3	BH3	TP2						
Depth to Top	10.50	15.50	20.00	0.60						
Depth To Bottom		15.95	20.45	1.00						
Date Sampled										
Sample Type	Solid	Solid	Solid	Soil - D						
Sample Matrix Code	7	7	7	5A						
% Stones >10mm _A	<0.1	<0.1	<0.1	5.7				% w/w	0.1	A-T-044
pH BRE _D ^{M#}	8.90	8.88	9.09	8.17				pH	0.01	A-T-021a
Sulphate BRE (water sol 2:1) _D ^{M#}	19	24	<10	<10				mg/l	10	A-T-026a

REPORT NOTES

General

This report shall not be reproduced, except in full, without written approval from Envirolab.

The results reported herein relate only to the material supplied to the laboratory.

The residue of any samples contained within this report, and any received with the same delivery, will be disposed of six weeks after initial scheduling. For samples tested for Asbestos we will retain a portion of the dried sample for a minimum of six months after the initial Asbestos testing is completed.

Analytical results reflect the quality of the sample at the time of analysis only.

Opinions and interpretations expressed are outside the scope of our accreditation.

If results are in italic font they are associated with an AQC failure, these are not accredited and are unreliable.

A deviating samples report is appended and will indicate if samples or tests have been found to be deviating. Any test results affected may not be an accurate record of the concentration at the time of sampling and, as a result, may be invalid.

The Client Sample No, Client Sample ID, Depth to Top, Depth to Bottom and Date Sampled were all provided by the client.

Soil chemical analysis:

All results are reported as dry weight (<40°C).

For samples with Matrix Codes 1 - 6 natural stones, brick and concrete fragments >10mm and any extraneous material (visible glass, metal or twigs) are removed and excluded from the sample prior to analysis and reported results corrected to a whole sample basis. This is reported as "% stones >10mm".

For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis and this supersedes any "A" subscripts

All analysis is performed on the sample as received for soil samples which are positive for asbestos or the client has informed asbestos may be present and/or if they are from outside the European Union and this supersedes any "D" subscripts.

TPH analysis of water by method A-T-007:

Free and visible oils are excluded from the sample used for analysis so that the reported result represents the dissolved phase only.

Electrical Conductivity of water by Method A-T-037:

Results greater than 12900µS/cm @ 25°C / 11550µS/cm @ 20°C fall outside the calibration range and as such are unaccredited.

Asbestos:

Asbestos in soil analysis is performed on a dried aliquot of the submitted sample and cannot guarantee to identify asbestos if only present in small numbers as discrete fibres/fragments in the original sample.

Stones etc. are not removed from the sample prior to analysis.

Quantification of asbestos is a 3 stage process including visual identification, hand picking and weighing and fibre counting by sedimentation/phase contrast optical microscopy if required. If asbestos is identified as being present but is not in a form that is suitable for analysis by hand picking and weighing (normally if the asbestos is present as free fibres) quantification by sedimentation is performed. Where ACMs are found a percentage asbestos is assigned to each with reference to 'HSG264, Asbestos: The survey guide' and the calculated asbestos content is expressed as a percentage of the dried soil sample aliquot used.

Predominant Matrix Codes:

1 = SAND, 2 = LOAM, 3 = CLAY, 4 = LOAM/SAND, 5 = SAND/CLAY, 6 = CLAY/LOAM, 7 = OTHER, 8 = Asbestos bulk ID sample, 9 = INCINERATOR ASH. Samples with Matrix Code 7 & 8 are not predominantly a SAND/LOAM/CLAY mix and are not covered by our BSEN 17025 or MCERTS accreditations, with the exception of bulk asbestos which are BSEN 17025 accredited.

Secondary Matrix Codes:

A = contains stones, B = contains construction rubble, C = contains visible hydrocarbons, D = contains glass/metal, E = contains roots/twigs.

Key:

IS Indicates Insufficient Sample for analysis.

US indicates Unsuitable Sample for analysis.

NDP indicates No Determination Possible.

NAD indicates No Asbestos Detected.

N/A indicates Not Applicable.

Superscript # indicates method accredited to ISO 17025.

Superscript "M" indicates method accredited to MCERTS.

Subscript "A" indicates analysis performed on the sample as received.

Subscript "D" indicates analysis performed on the dried sample, crushed to pass a 2mm sieve

Subscript "A" indicates analysis has dependant options against results. Testing dependant on results appear in the comments area of your sample receipt.

EPH CWG results have humics mathematically subtracted through instrument calculation

TPH results "with Cleanup" indicates results cleaned up with Silica during extraction

EPH CWG GCxGC ID from TPH CWG

Where we have identified humic substances in any ID's from TPH CWG with Clean Up please note that the concentration of these humic substances is not included in the quantified results and are included in the ID for information.

Please contact us if you need any further information.

v2

Envirolab Deviating Samples Report

Units 7&8 Sandpits Business Park, Mottram Road, Hyde, SK14 3AR
Tel. 0161 368 4921 email. ask@envlab.co.uk

Client: Structural Soils Limited (Tonbridge Lab), Anerley Court, Half Moon Lane,
Hildenborough, Kent, UK, TN11 9HU

Project No: 23/03427

Date Received: 12/04/2023 (am)

Project: Gravesham Leisure Centre

Cool Box Temperatures (°C): 6.1

Clients Project No: 52511

Lab Sample ID	23/03427/1	23/03427/2	23/03427/3	23/03427/4	23/03427/5	23/03427/6	23/03427/7	23/03427/8	23/03427/9	23/03427/10	23/03427/11
Client Sample No											
Client Sample ID/Depth	BH1 3.00-3.45m	BH1 8.00-8.45m	BH1 13.50m	BH1 18.00m	BH2 5.00-5.45m	BH2 10.50m	BH2 15.00m	BH3 10.50m	BH3 15.50-15.95m	BH3 20.00-20.45m	TP2 0.60-1.00m
Date Sampled											
Deviation Code											
E (no date)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Key
E (no date) No sampling date provided (all results affected if not provided)

If, at any point before reaching the laboratory, the temperature of the samples has breached those set in published standards, e.g. BS-EN 5667-3, ISO 18400-102:2017, then the concentration of any affected analytes may differ from that at the time of sampling.

Envirolab Analysis Dates

Lab Sample ID	23/03427/1	23/03427/2	23/03427/3	23/03427/4	23/03427/5	23/03427/6	23/03427/7	23/03427/8	23/03427/9	23/03427/10	23/03427/11
Client Sample No											
Client Sample ID/Depth	BH1 3.00-3.45m	BH1 8.00-8.45m	BH1 13.50m	BH1 18.00m	BH2 5.00-5.45m	BH2 10.50m	BH2 15.00m	BH3 10.50m	BH3 15.50-15.95m	BH3 20.00-20.45m	TP2 0.60-1.00m
Date Sampled											
A-T-026s	18/04/2023	18/04/2023	18/04/2023	18/04/2023	18/04/2023	18/04/2023	18/04/2023	18/04/2023	18/04/2023	18/04/2023	18/04/2023
A-T-031s	18/04/2023	18/04/2023	18/04/2023	18/04/2023	18/04/2023	18/04/2023	18/04/2023	18/04/2023	18/04/2023	18/04/2023	18/04/2023
A-T-044	18/04/2023	18/04/2023	18/04/2023	18/04/2023	18/04/2023	18/04/2023	18/04/2023	18/04/2023	18/04/2023	18/04/2023	18/04/2023

The above dates are the analysis completion dates, please note that these are not necessarily the date that the analysis was weighed/extracted.

End of Report

Appendix J

GENERIC ASSESSMENT CRITERIA FOR HUMAN HEALTH

Generic assessment criteria for human health: commercial scenario

Background

RSK's generic assessment criteria (GAC) were initially prepared following the publication by the Environment Agency (EA) of soil guideline value (SGV) and toxicological (TOX) reports, and associated publications in 2009⁽¹⁾. RSK GAC were updated following the publication of GAC by LQM/CIEH in 2009⁽²⁾. RSK GAC are periodically revised when updated information on toxicological, land use or receptor parameters is published.

Updates to the RSK GAC

In 2014, the publication of Category 4 Screening Levels (C4SL)^(3,4), as part of the Defra-funded research project SP1010, included modifications to certain exposure assumptions documented within EA Science Report SC050221/SR3 (herein after referred to as SR3)⁽⁵⁾ used in the generation of SGVs.

C4SL were initially published for six substances (cadmium, arsenic, benzene, benzo(a)pyrene, chromium VI and lead) for a sandy loam soil type with 6% soil organic matter, based on a low level of toxicological concern (LLTC; see Section 2.3 of research project report SP1010⁽³⁾). Further C4SL were published in 2021 for vinyl chloride, tetrachloroethene (PCE) and trichloroethene (TCE). Where a C4SL has been published, the RSK GAC duplicates the C4SL using all input parameters within the SP1010 final project report⁽³⁾ and associated chemical specific reports⁽⁶⁾, and adopts them as GAC for these substances. Due to the use of decimal places rather than significant figures applied to the Contaminated Land Exposure Assessment (CLEA) tool outputs, the GAC presented may be marginally differently to the C4SL values, however any differences between the values are minimal and would not equate to an unacceptable risk.

For all other substances the only C4SL exposure modification relevant to a commercial end use are daily inhalation rates.

The RSK GAC have also been revised with updated toxicology published by LQM/CIEH in 2015⁽⁷⁾ or by the USEPA⁽¹⁴⁾, where a C4SL has not been published.

RSK GAC derivation for metals and organic compounds

Model selection

Soil assessment criteria (SAC) were calculated using the CLEA tool v1.071, supporting EA guidance^(5,8,9) and revised exposure scenarios published for the C4SL⁽³⁾. The SAC are also termed GAC.

Pathway selection

In accordance with SR3⁽⁵⁾ the commercial scenario considers risks to a female worker who works from the age of 16 to 65 years. It should be noted that this end use is not suitable for a workplace nursery but may be appropriate for a sports centre or shopping centre where children are present. In accordance with Box 3.5, SR3⁽⁵⁾ the pathways considered for production of the SAC in the commercial scenario are

- direct soil and dust ingestion

- dermal contact with soil both indoors and outdoors
- indoor air inhalation from soil and vapour and outdoor inhalation of soil and vapour.

With respect to volatilisation, the CLEA model assumes a simple linear partitioning of a chemical in the soil between the sorbed, dissolved and vapour phase⁽⁹⁾. The upper boundaries of this partitioning are represented by the maximum aqueous solubility and pure saturated vapour concentration of the chemical. The CLEA model estimates saturated soil concentrations where these limits are reached⁽⁹⁾. The CLEA software uses a traffic light system to identify when individual and/or combined assessment criteria exceed the lower of either the aqueous- or vapour-based soil saturation limits. Model output cells are flagged red where the saturated soil concentration has been exceeded and the contribution of the indoor and outdoor vapour pathway to total exposure is greater than 10%. In this case, further consideration of the following is required⁽⁹⁾:

- Free phase contamination may be present.
- Exposure from the vapour pathways will be over-predicted by the model, as in reality the vapour phase concentration will not increase at concentrations above saturation limits
- Where the vapour pathway contribution is greater than 90%, it is unlikely the relevant health criteria value (HCV) will be exceeded at soil concentrations at least a factor of ten higher than the relevant HCV.

Where the vapour pathway is the predominant pathway (contributes greater than 90% of exposure) or the only exposure route considered and the cell is highlighted red (SAC exceeds saturation limit), the risk based on the assumed conceptual model is likely to be negligible as the vapour risk is assumed to be tolerable at maximum possible soil concentrations. In such circumstances, the vapour pathway exposure should be considered based on the presence of free phase or non-aqueous phase liquid sources and the measured concentrations of volatile organic compounds (VOC) in the vapour phase. Screening could be considered based on setting the SAC as the modelled soil saturation limits. However, as stated within the CLEA handbook⁽⁹⁾, this is likely to not be practical in many cases because of the very low saturation limits and, in any case, is highly conservative.

It should also be noted that for mixtures of compounds, free phase may be present where soil (or groundwater) concentrations are well below saturation limits for individual compounds.

Where the vapour pathway is only one of the exposure pathways considered, an additional approach can then be utilised as detailed within Section 4.12 of the CLEA model handbook⁽⁹⁾, which explains how to calculate an effective assessment criterion manually.

SR3⁽⁵⁾ states that, as a general rule of thumb, it is recognised that estimating vapour phase concentrations from dissolved and sorbed phase contamination by petroleum hydrocarbons are at least a factor of ten higher than those likely to be measured on-site. RSK has therefore applied an empirical subsurface to indoor air correction factor of 10 into the CLEA model chemical database for all petroleum hydrocarbon fractions (including BTEX, trimethylbenzenes and the polycyclic aromatic hydrocarbons (PAH) naphthalene, acenaphthene and acenaphthylene) to reduce this conservatism.

Input selection

The most up-to-date published chemical and toxicological data was obtained from EA Report SC050021/SR7⁽¹⁰⁾, the EA TOX⁽¹¹⁾ reports, the C4SL SP1010 project report and associated chemical specific reports^(3,6), the 2015 LQM/CIEH report⁽⁷⁾ or the USEPA IRIS database⁽¹⁴⁾. Where a LLTC^(3,6) has been published for a substance, RSK has used these input parameters to derive the RSK GAC. Toxicological and specific chemical parameters for 1,2,4-trimethylbenzene, barium, methyl tertiary-butyl ether (MTBE), 1,1,2-trichloroethane, 1,1-dichloroethene, 1,2-dichloropropane, 2-chloronaphthalene, chloroethane, chloromethane, cis 1,2-dichloroethene, dichloromethane, hexachloroethane and trans 1,2-dichloroethene were obtained from the CL:AIRE Soil Generic Assessment Criteria report⁽¹¹⁾.

For TPH, aromatic hydrocarbons C₅–C₈ were not modelled, as this range comprises benzene (>EC5-EC7) and toluene (>EC7-EC8), which are modelled separately.

Physical parameters

For the commercial end use, the CLEA default pre-1970s three-storey office building was used. SR3⁽⁵⁾ notes this commercial building type to be the most conservative in terms of protection from vapour intrusion. The default input building parameters presented in Table 3.10 of SR3⁽⁵⁾ have been used.

The parameters for a sandy loam soil type were used in line with Table 4.4 of SR3⁽⁵⁾. This includes a value of 6% for the percentage of soil organic matter (SOM) within the soil. In RSK's experience, this is rather high for many sites. To avoid undertaking site-specific risk assessments for this SOM, RSK has produced an additional set of GAC for SOM of 1% and 2.5% for all substances using the CLEA tool.

Summary of modifications to the default CLEA SR3⁽⁵⁾ input parameters for a commercial land use

In summary, the RSK commercial GAC were produced using the default input parameters for soil properties, the air dispersion model, building properties and the vapour model detailed in SR3⁽⁵⁾. Modifications to the default SR3⁽⁵⁾ exposure scenarios based on the C4SL exposure scenarios⁽³⁾ are presented in Table 2 below. The sole modification to the default commercial input parameters is the updated inhalation rate.

The final selected GAC are presented by pathway in Table 3 with the combined GAC in Table 4.

Figure 1: Conceptual model for CLEA commercial scenario

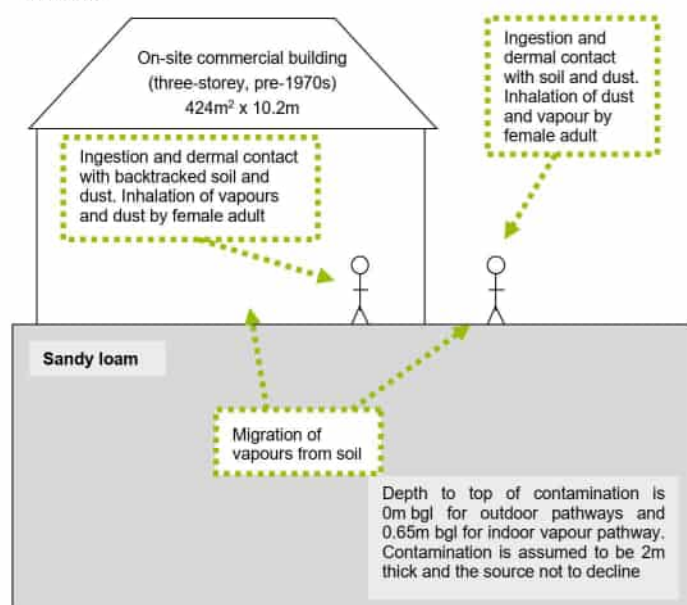


Table 1: Exposure assessment parameters for commercial scenario – inputs for CLEA model

Parameter	Value	Justification
Land use	Commercial	Chosen land use
Receptor	Female worker	Taken as female adult exposed over 49 years from age 16 to 65 years, Box 3.5, SR3 ⁽⁵⁾
Building	Office (pre-1970)	Key generic assumption given in Box 3.5, SR3 ⁽⁵⁾ . Pre-1970s three-storey office building chosen as it is the most conservative in terms of protection from vapour intrusion (Section 3.4.6, SR3 ⁽⁵⁾)
Soil type	Sandy loam	Most common UK soil type (Section 4.3.1, Table 4.4, SR3 ⁽⁵⁾)
Start age class (AC)	17	AC corresponding to key generic assumption that the critical receptor is a working female adult exposed over a 49-year period from age 16 to 65 years. Assumption given in Box 3.5, SR3 ⁽⁵⁾
End AC	17	
SOM (%)	6	Representative of sandy loam according to EA guidance note dated January 2009 entitled 'Changes We Have Made to the CLEA Framework Documents' ⁽¹³⁾
	1	To provide SAC for sites where SOM < 6% as often observed by RSK
	2.5	
pH	7	Model default

Table 2: Commercial – modified receptor inputs

Parameter	Unit	Value	Justification
Inhalation rate (AC17)	m ³ day ⁻¹	15.7	Mean value USEPA, 2011 ⁽¹²⁾ ; Table 3.2, SP1010 ⁽³⁾

References

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5. Environment Agency (2009), *Science Report – SC050021/SR3. Updated technical background to the CLEA model* (Bristol: Environment Agency).
6. Contaminated Land: Applications in Real Environment (CL:AIRE) (2014). 'Appendices C to H). DEFRA research project SP1010'. CL:AIRE (2021). Category 4 Screening Levels: Trichloroethene (TCE). CL:AIRE, London. ISBN 978-1-905046-38-6. CL:AIRE (2021). Category 4 Screening Levels: Vinyl Chloride. CL:AIRE, London. ISBN 978-1-905046-36-2. CL:AIRE (2021). Category 4 Screening Levels: Tetrachloroethene (PCE). CL:AIRE, London. ISBN 978-1-905046-37-9.
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8. Environment Agency (2009), *Human health toxicological assessment of contaminants in soil. Science Report – Final SC050021/SR2* (Bristol: Environment Agency).
9. Environment Agency (2009), *Science Report – SC050021/SR4 CLEA Software (version 1.05) Handbook* (Bristol: Environment Agency).
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11. CL:AIRE (2010), *Soil Generic Assessment Criteria for Human Health Risk Assessment* (London: CL:AIRE).
12. USEPA (2011), *Exposure factors handbook*, EPA/600/R-090/052F (Washington, DC: Office of Research and Development).
13. Environment Agency (2009), 'Changes made to the CLEA framework documents after the three-month evaluation period in 2008', released January 2009.

14. USEPA (2010). Hydrogen cyanide and cyanide salts. Integrated Risk Information Systems (IRIS) Chemical Assessment Summary. September 2010. <https://www.epa.gov/iris> (accessed 9 December 2015)

GENERIC ASSESSMENT CRITERIA FOR HUMAN HEALTH - COMMERCIAL



Table 3
Human health generic assessment criteria by pathway for commercial scenario

Compound	Route	SAC appropriate to pathway SOM 1% (mg/kg)			Self saturation limit (mg/kg)	SAC appropriate to pathway SOM 2.5% (mg/kg)			Self saturation limit (mg/kg)	SAC appropriate to pathway SOM 5% (mg/kg)			Self saturation limit (mg/kg)
		Oral	Inhalation	Combined		Oral	Inhalation	Combined		Oral	Inhalation	Combined	
Metals													
Arsenic	(a,b)	6.35E+03	1.35E+03	NR	NR	6.35E+03	1.35E+03	NR	NR	6.35E+03	1.35E+03	NR	NR
Barium	(b)	2.21E+04	NR	NR	NR	2.21E+04	NR	NR	NR	2.21E+04	NR	NR	NR
Beryllium		3.97E+03	1.17E+01	NR	NR	3.97E+03	1.17E+01	NR	NR	3.97E+03	1.17E+01	NR	NR
Boron		2.38E+05	2.92E+07	NR	NR	2.38E+05	2.92E+07	NR	NR	2.38E+05	2.92E+07	NR	NR
Cadmium	(a)	7.73E+02	6.57E+02	6.58E+02	NR	7.73E+02	6.57E+02	6.58E+02	NR	7.73E+02	6.57E+02	6.58E+02	NR
Chromium (III) - trivalent	(c)	3.31E+05	6.57E+03	NR	NR	3.31E+05	6.57E+03	NR	NR	3.31E+05	6.57E+03	NR	NR
Chromium (VI) - hexavalent	(a,b)	6.62E+02	4.91E+01	NR	NR	6.62E+02	4.91E+01	NR	NR	6.62E+02	4.91E+01	NR	NR
Copper		1.89E+05	6.96E+04	6.63E+04	NR	1.89E+05	6.96E+04	6.63E+04	NR	1.89E+05	6.96E+04	6.63E+04	NR
Lead	(a)	2.53E+05	NR	NR	NR	2.53E+05	NR	NR	NR	2.53E+05	NR	NR	NR
Elemental Mercury (Hg ⁰)	(d)	NR	1.94E+01	NR	4.21E+00	NR	3.98E+01	NR	1.07E+01	NR	6.80E+01	NR	2.58E+01
Inorganic Mercury (Hg ²⁺)		1.18E+03	1.93E+04	1.13E+03	NR	1.18E+03	1.93E+04	1.13E+03	NR	1.18E+03	1.93E+04	1.13E+03	NR
Methyl Mercury (Hg ⁺)		3.38E+02	2.13E+03	2.93E+02	7.33E+01	3.38E+02	3.87E+03	3.11E+02	1.42E+02	3.38E+02	7.33E+03	3.23E+02	3.04E+02
Silver	(a)	3.92E+03	6.83E+02	NR	NR	3.92E+03	6.83E+02	NR	NR	3.92E+03	6.83E+02	NR	NR
Selenium	(b)	1.23E+04	NR	NR	NR	1.23E+04	NR	NR	NR	1.23E+04	NR	NR	NR
Vanadium		2.13E+04	3.18E+03	NR	NR	2.13E+04	3.18E+03	NR	NR	2.13E+04	3.18E+03	NR	NR
Zinc	(b)	7.29E+05	1.97E+06	NR	NR	7.29E+05	1.97E+06	NR	NR	7.29E+05	1.97E+06	NR	NR
Zincite (ZnO)		6.56E+05	7.43E+04	6.56E+05	NR	6.56E+05	7.43E+04	6.56E+05	NR	6.56E+05	7.43E+04	6.56E+05	NR
Volatile Organic Compounds													
Benzene	(a)	1.09E+03	2.79E+01	2.72E+01	1.22E+02	1.09E+03	6.19E+01	4.36E+01	2.26E+02	1.09E+03	1.09E+02	3.86E+01	4.71E+03
Toluene		4.24E+05	6.69E+04	6.69E+04	8.89E+02	4.24E+05	1.43E+05	1.07E+05	1.92E+05	4.24E+05	3.24E+05	1.84E+05	4.36E+05
Ethylbenzene		1.91E+05	5.99E+03	5.71E+03	5.19E+02	1.91E+05	1.38E+04	1.28E+04	1.22E+03	1.91E+05	3.21E+04	2.75E+04	2.84E+05
Xylene - m		3.43E+05	6.26E+03	6.19E+03	6.29E+02	3.43E+05	1.47E+04	1.41E+04	1.47E+03	3.43E+05	3.44E+04	3.12E+04	3.46E+05
Xylene - o		3.43E+05	6.79E+03	6.69E+03	4.79E+02	3.43E+05	1.57E+04	1.50E+04	1.12E+03	3.43E+05	3.69E+04	3.30E+04	2.62E+05
Xylene - p		3.43E+05	6.03E+03	5.92E+03	5.76E+02	3.43E+05	1.41E+04	1.36E+04	1.36E+03	3.43E+05	3.28E+04	3.00E+04	3.17E+05
Total xylene		3.43E+05	6.03E+03	5.92E+03	6.25E+02	3.43E+05	1.41E+04	1.36E+04	1.47E+03	3.43E+05	3.28E+04	3.00E+04	3.46E+05
Methyl tertiary-butyl ether (MTBE)		5.72E+05	7.54E+02	7.46E+01	2.64E+04	5.72E+05	1.23E+04	1.21E+04	3.31E+04	5.72E+05	2.34E+04	2.24E+04	6.77E+04
1,1,1,2-Tetrachloroethane		1.10E+04	1.09E+02	1.08E+03	2.60E+03	1.10E+04	2.53E+02	2.47E+03	6.03E+03	1.10E+04	3.88E+03	3.88E+03	1.69E+04
1,1,2,2-Tetrachloroethane		1.10E+04	2.81E+02	2.74E+02	2.67E+03	1.10E+04	5.73E+02	5.46E+02	8.46E+03	1.10E+04	1.36E+03	1.13E+03	1.20E+04
1,1,1-Trichloroethane		1.14E+06	6.60E+02	6.60E+03	1.43E+03	1.14E+06	1.25E+03	1.33E+03	2.10E+03	1.14E+06	2.94E+03	2.55E+03	6.09E+03
1,1,2-Trichloroethane		7.62E+03	9.02E+01	6.91E+01	4.03E+03	7.62E+03	1.84E+02	1.80E+02	8.21E+03	7.62E+03	4.02E+02	3.82E+02	1.80E+04
1,1-Dichloroethane		8.76E+04	2.43E+01	2.43E+01	2.23E+03	8.76E+04	4.36E+01	4.36E+01	3.94E+03	8.76E+04	6.68E+01	6.67E+01	7.94E+03
1,2-Dichloroethane		2.29E+02	5.73E+01	6.71E+01	3.41E+03	2.29E+02	3.71E+01	6.67E+01	4.91E+03	2.29E+02	1.67E+01	1.63E+01	8.43E+03
1,2,4-Trimethylbenzene		NR	3.98E+02	NR	4.74E+02	NR	6.44E+02	NR	1.16E+03	NR	1.64E+03	NR	2.18E+03
1,3,5-Trimethylbenzene	(a)	NR	NR	NR	2.30E+02	NR	NR	NR	6.02E+02	NR	NR	NR	1.30E+03
1,2-Dichloropropane		2.57E+04	3.14E+00	3.13E+00	1.19E+03	2.57E+04	5.54E+00	5.54E+00	2.11E+03	2.57E+04	1.71E+01	1.71E+01	4.24E+03
Carbon Tetrachloride (tetrachloroethane)		7.62E+03	2.97E+01	2.87E+00	1.52E+03	7.62E+03	6.29E+00	6.88E+00	3.22E+03	7.62E+03	1.49E+01	1.49E+01	7.54E+03
Chloroethane		NR	6.03E+02	NR	2.61E+03	NR	1.23E+03	NR	3.54E+03	NR	1.97E+03	NR	3.71E+03
Chloroethane		NR	3.94E+01	NR	1.91E+03	NR	3.13E+00	NR	2.54E+03	NR	1.49E+00	NR	2.39E+03
Gas 1,2-Dichloroethane		1.98E+01	NR	NR	3.94E+03	2.29E+01	NR	NR	6.13E+03	4.44E+01	NR	NR	1.29E+04
Dichloromethane		8.94E+03	2.63E+02	2.57E+02	2.72E+03	8.94E+03	1.02E+02	3.39E+02	8.88E+03	8.94E+03	5.53E+02	5.53E+02	1.53E+04
Tetrachloroethane (PCE)		2.67E+04	2.45E+01	2.44E+01	4.24E+02	2.67E+04	5.49E+01	5.48E+01	9.13E+02	2.67E+04	1.38E+02	1.38E+02	2.38E+03
Trans 1,2-Dichloroethane		1.23E+04	2.57E+01	NR	3.43E+03	5.23E+04	3.74E+01	NR	6.17E+02	3.23E+04	7.63E+01	NR	1.25E+04
Trichloroethane (TCE)		7.36E+01	2.59E+00	NR	3.54E+03	1.53E+00	5.43E+00	NR	3.22E+03	3.38E+03	1.25E+01	NR	7.14E+03
Vinyl Chloride (acetylene)		1.19E+02	1.19E+00	1.12E+00	1.36E+03	1.19E+02	1.44E+00	1.45E+00	1.78E+03	1.19E+02	2.24E+00	2.24E+00	2.83E+03
Semi-Volatile Organic Compounds													
2-Chloronaphthalene		1.93E+05	3.71E+02	3.70E+02	1.14E+02	1.93E+05	9.07E+02	9.03E+02	2.80E+02	1.93E+05	2.13E+03	2.10E+03	6.69E+02
Acenaphthene		1.59E+05	2.75E+06	1.66E+05	5.79E+01	1.59E+05	5.36E+06	1.38E+05	1.61E+02	1.59E+05	6.93E+06	1.66E+05	3.96E+02

Table 3

Human health generic assessment criteria by pathway for commercial scenario

Compound	Route	SAC appropriate to pathway SOM 1% (mg/kg)			Soil saturation limit (mg/kg)	SAC appropriate to pathway SOM 2.5% (mg/kg)			Soil saturation limit (mg/kg)	SAC appropriate to pathway SOM 6% (mg/kg)			Soil saturation limit (mg/kg)
		Oral	Inhalation	Combined		Oral	Inhalation	Combined		Oral	Inhalation	Combined	
Acenaphthylene		1.10E+00	2.68E+06	1.05E+05	8.81E+01	1.10E+00	5.23E+06	1.07E+05	2.12E+02	1.10E+00	8.50E+06	1.08E+05	3.03E+02
Acridene		5.40E+00	1.13E+07	5.23E+05	1.17E+00	5.40E+00	2.38E+07	5.38E+05	2.91E+00	5.40E+00	4.13E+07	5.42E+05	6.96E+00
Benz(a)anthracene		2.84E+02	4.08E+02	1.67E+02	1.71E+00	2.84E+02	4.47E+02	1.74E+02	4.28E+00	2.84E+02	4.67E+02	1.76E+02	1.03E+01
Benz(a)pyrene	(a)	7.68E+01	2.04E+02	5.58E+01	9.11E+01	7.68E+01	2.09E+02	5.61E+01	2.28E+00	7.68E+01	2.11E+02	5.63E+01	5.46E+00
Benz(b)fluoranthene		7.13E+01	1.17E+02	4.43E+01	1.22E+00	7.13E+01	1.20E+02	4.47E+01	3.04E+00	7.13E+01	1.21E+02	4.49E+01	7.29E+00
Benz(g,h)fluoranthene		6.29E+03	1.05E+04	3.55E+03	1.54E+02	6.29E+03	1.06E+04	3.59E+03	3.85E+02	6.29E+03	1.07E+04	3.59E+03	9.23E+02
Benz(k)fluoranthene		1.88E+03	3.11E+02	1.17E+03	6.87E+01	1.88E+03	3.17E+02	1.18E+03	1.72E+00	1.88E+03	3.21E+02	1.19E+03	4.12E+00
Chrysene		5.67E+02	8.88E+02	3.48E+02	4.40E+01	5.67E+02	9.29E+02	3.52E+02	1.19E+00	5.67E+02	9.47E+02	3.55E+02	3.64E+00
Dibenz(a,h)anthracene		5.67E+00	9.32E+00	3.33E+00	3.93E+03	5.67E+00	9.52E+00	3.55E+00	9.82E+02	5.67E+00	9.64E+00	3.57E+00	2.38E+02
Fluoranthene		2.29E+04	1.89E+06	2.26E+04	1.89E+01	2.29E+04	2.72E+06	2.27E+04	4.73E+01	2.29E+04	3.32E+06	2.27E+04	1.13E+02
Fluorene		7.31E+04	4.50E+05	6.30E+04	3.09E+01	7.31E+04	1.06E+06	6.84E+04	7.62E+01	7.31E+04	3.24E+06	7.09E+04	1.83E+02
Hexachlorobenzene		2.09E+01	NR	NR	8.17E+00	4.98E+01	NR	NR	2.01E+01	1.11E+02	NR	NR	4.81E+01
Indeno(1,2,3-cd)pyrene		8.10E+02	1.31E+02	5.01E+02	6.13E+02	8.10E+02	1.30E+03	5.06E+02	1.53E+01	8.10E+02	1.31E+03	5.09E+02	3.08E+01
Naphthalene		3.64E+04	1.87E+03	1.78E+03	7.64E+01	3.64E+04	4.39E+03	3.92E+03	1.83E+02	3.64E+04	9.94E+03	7.81E+03	4.32E+02
Phenanthrene		2.28E+04	5.32E+05	2.13E+04	3.60E+01	2.28E+04	1.00E+06	2.24E+04	8.96E+01	2.28E+04	1.06E+06	2.25E+04	2.04E+02
Pyrene		5.49E+04	4.47E+06	5.42E+04	2.20E+00	5.49E+04	6.40E+06	5.44E+04	5.49E+00	5.49E+04	7.91E+06	5.49E+04	1.33E+01
Pyrene		1.10E+06	2.63E+04	2.58E+04	2.42E+04	1.10E+06	3.04E+04	2.94E+04	3.81E+04	1.10E+06	3.40E+04	3.26E+04	7.03E+04
Total petroleum hydrocarbons													
Arenatics hydrocarbons >C9-EC8		4.77E+08	3.19E+03	3.19E+03	3.04E+02	4.77E+08	5.86E+03	5.86E+03	5.59E+02	4.77E+08	1.21E+04	1.21E+04	1.19E+03
Aliphatics hydrocarbons >C9-EC8		4.77E+08	7.19E+03	7.19E+03	1.44E+02	4.77E+08	1.74E+04	1.74E+04	3.22E+02	4.77E+08	3.97E+04	3.96E+04	7.86E+02
Arenatics hydrocarbons >C9-EC10		9.53E+04	2.02E+03	2.02E+03	7.77E+01	9.53E+04	9.91E+03	9.91E+03	1.82E+02	9.53E+04	1.17E+04	1.17E+04	4.51E+02
Aliphatics hydrocarbons >C9-EC12		9.53E+04	3.97E+03	3.97E+03	4.75E+01	9.53E+04	2.47E+04	2.29E+04	1.19E+02	9.53E+04	8.89E+04	4.72E+04	3.83E+02
Arenatics hydrocarbons >EC12-EC16		9.53E+04	8.36E+04	5.88E+04	2.37E+01	9.53E+04	2.04E+05	8.17E+04	5.91E+01	9.53E+04	4.81E+05	9.09E+04	1.42E+02
Aliphatics hydrocarbons >EC16-EC20	(b)	1.58E+06	NR	NR	8.48E+00	1.73E+06	NR	NR	2.12E+02	1.62E+06	NR	NR	5.09E+01
Aliphatics hydrocarbons >EC20-EC44	(b)	1.58E+06	NR	NR	8.48E+00	1.73E+06	NR	NR	2.12E+01	1.62E+06	NR	NR	5.09E+01
Aromatic hydrocarbons >EC8-EC16		3.81E+04	3.50E+02	3.44E+03	6.13E+02	3.81E+04	8.66E+03	8.11E+03	1.50E+03	3.81E+04	2.65E+04	1.70E+04	3.58E+03
Aromatic hydrocarbons >EC16-EC12		3.81E+04	1.90E+04	1.62E+04	3.64E+02	3.81E+04	4.69E+04	2.79E+04	8.99E+02	3.81E+04	1.10E+05	3.42E+04	2.19E+03
Aromatic hydrocarbons >EC12-EC16		3.81E+04	2.02E+05	3.62E+04	1.69E+02	3.81E+04	4.76E+05	3.73E+04	4.19E+02	3.81E+04	1.05E+06	3.78E+04	1.60E+03
Aromatic hydrocarbons >EC16-EC21	(c)	3.82E+04	NR	NR	5.27E+01	3.82E+04	NR	NR	6.34E+02	3.84E+04	NR	NR	3.21E+02
Aromatic hydrocarbons >EC21-EC35	(b)	2.84E+04	NR	NR	4.83E+00	2.84E+04	NR	NR	1.21E+01	2.84E+04	NR	NR	3.38E+01
Aromatic hydrocarbons >EC35-EC44	(b)	2.84E+04	NR	NR	4.83E+00	2.84E+04	NR	NR	1.21E+01	2.84E+04	NR	NR	3.38E+01

Notes:

EC = equivalent carbon; QAC = groundwater screening value; SAC = soil screening value

The CLEA model output is colour coded depending upon whether the soil saturation limit has been exceeded

	Calculated SAC exceeds soil saturation limit and may significantly affect the interpretation of any exceedances as the contribution of the indoor and outdoor vapour pathway to total exposure is >10%.
	Calculated SAC exceeds soil saturation limit but the exceedance will not affect the SAC significantly as the contribution of the indoor and outdoor vapour pathway to total exposure is <10%.
	Calculated SAC does not exceed the soil saturation limit.

The SAC for organic compounds are dependent upon soil organic matter (SOM) (%) content. To obtain SOM from total organic carbon (TOC) (%) divide by 0.58. 1% SOM is 0.58% TOC. DL Rowell Soil Science: Methods and Applications, Longmans, 1994.

SAC for TPH fractions, PAHs naphthalene, acenaphthene and acenaphthylene, BTEX and trimethylbenzene compounds were produced using an attenuation factor for the indoor air inhalation pathway of 10 to reduce conservatism associated with the vapour inhalation pathway (Section 10.1.1, SR3).

(a) SAC for arsenic, benzene, benzo(a)pyrene, cadmium, chromium VI and lead are derived using the CAS toxicology data.

(b) SAC for bismuth and selenium should not include the inhalation pathway as no expert group HCV has been derived; aliphatic and aromatic hydrocarbons >EC16 should not include inhalation pathway due to their non-volatile nature and inhalation exposure being minimal (oral, dermal and inhalation exposures is compared to the oral HCV); arsenic should only be based on oral contribution (rather than combined) owing to the relative small contribution from inhalation in accordance with the SOV report. The Oral SAC should be adopted for zinc and benzo(a)pyrene.

(c) SAC for OIB should be based on the lower of the oral and inhalation SAC (see LQMCEH 2015 Section 6.8).

(d) SAC for elemental mercury, chromium VI and nickel should be based on the inhalation pathway only.

(e) SAC for 1,3,5-trimethylbenzene is not recorded owing to the lack of toxicological data. SAC for 1,2,4-trimethylbenzene may be used.



Table 4
Human Health Generic Assessment Criteria for Commercial Scenario

Compound	SAC for Soil SOM 1% (mg/kg)	SAC for Soil SOM 2.5% (mg/kg)	SAC for Soil SOM 6% (mg/kg)
Metals			
Arsenic	640	640	640
Barium	22,000	22,000	22,000
Beryllium	12	12	12
Boron	240,000	240,000	240,000
Cadmium	410	410	410
Chromium (III) - trivalent	8,600	8,600	8,600
Chromium (VI) - hexavalent	49	49	49
Copper	68,000	68,000	68,000
Lead	2,300	2,300	2,300
Elemental Mercury (Hg ⁰)	15 (4)	33 (11)	58 (26)
Inorganic Mercury (Hg ²⁺)	1,120	1,120	1,120
Methyl Mercury (Hg ⁴⁺)	290 (73)	310 (142)	320
Nickel	980	980	980
Selenium	12,000	12,000	12,000
Vanadium	9,000	9,000	9,000
Zinc	740,000	740,000	740,000
Cyanide (free)	650	650	650
Volatile Organic Compounds			
Benzene	27	50	98
Toluene	56,000 (869)	107,000 (1,916)	184,000 (4,357)
Ethylbenzene	6,000 (518)	13,000 (1,216)	27,000 (2,844)
Xylene - m	6,200 (625)	14,100 (1,474)	31,200 (3,457)
Xylene - o	6,600 (478)	15,000 (1,120)	33,000 (3,618)
Xylene - p	5,900 (576)	13,600 (1,353)	30,000 (3,167)
Total xylene	5,900 (625)	13,600 (1,474)	30,000 (3,457)
Methyl tertiary-Butyl ether (MTBE)	7,500	12,100	22,400
1,1,1,2-Tetrachloroethane	110	250	560
1,1,2,2-Tetrachloroethane	270	550	1,130
1,1,1-Trichloroethane	700	1,300	3,000
1,1,2 Trichloroethane	89	180	382
1,1-Dichloroethene	24	43	87
1,2-Dichloroethane	0.67	0.97	1.65
1,2,4-Trimethylbenzene	330	640	1,040
1,3,5-Trimethylbenzene	NR	NR	NR
1,2-Dichloropropane	3	6	11
Carbon Tetrachloride (tetrachloromethane)	2.9	6.3	14.2
Chloroethane	901	1,223	1,972
Chloromethane	1.0	1.1	1.5
Cis 1,2 Dichloroethene	14	23	44
Dichloromethane	257	339	526
Tetrachloroethene (PCE)	24	55	125
Trichloroethene (TCE)	0.7	1.5	3.4
Trans 1,2 Dichloroethene	21	37	76
Vinyl Chloride (chloroethene)	1.1	1.4	2.2
Semi-Volatile Organic Compounds			
2-Chloronaphthalene	370 (114)	902 (280)	2,098 (669)
Acenaphthene	110,000	110,000	110,000
Acenaphthylene	110,000	110,000	110,000
Anthracene	520,000	540,000	540,000
Benzo(a)anthracene	170	170	180
Benzo(a)pyrene	77	77	77
Benzo(b)fluoranthene	44	45	45
Benzo(g,h,i)perylene	3,900	3,900	4,000
Benzo(k)fluoranthene	1,200	1,200	1,200
Chrysene	350	350	350
Dibenzo(a,h)anthracene	3.5	3.6	3.6
Fluoranthene	23,000	23,000	23,000
Fluorene	63,000 (31)	68,000	71,000
Hexachloroethane	21 (8)	50 (20)	111 (48)
Indeno(1,2,3-cd)pyrene	600	610	610
Naphthalene	1,800 (76)	3,900 (183)	7,800 (432)
Phenanthrene	22,000	22,000	23,000
Pyrene	54,000	54,000	54,000
Phenol	440*	690*	1,300*
Total Petroleum Hydrocarbons			
Aliphatic hydrocarbons EC ₅ -EC ₆	3,200 (304)	5,900 (558)	12,100 (1,150)
Aliphatic hydrocarbons >EC ₆ -EC ₉	7,800 (144)	17,400 (322)	39,600 (736)
Aliphatic hydrocarbons >EC ₉ -EC ₁₀	2,000 (78)	4,800 (190)	11,300 (451)
Aliphatic hydrocarbons >EC ₁₀ -EC ₁₂	9,700 (48)	22,900 (118)	47,300 (283)
Aliphatic hydrocarbons >EC ₁₂ -EC ₁₆	59,000 (24)	82,000 (59)	90,000 (142)
Aliphatic hydrocarbons >EC ₁₆ -EC ₂₅	1,000,000**	1,000,000**	1,000,000**
Aliphatic hydrocarbons >EC ₂₅ -EC ₄₄	1,000,000**	1,000,000**	1,000,000**
Aromatic hydrocarbons >EC ₇ -EC ₁₀	3,500 (613)	8,100 (1,503)	17,000 (3,580)
Aromatic hydrocarbons >EC ₁₀ -EC ₁₂	16,000 (364)	28,000 (899)	34,000 (2,150)
Aromatic hydrocarbons >EC ₁₂ -EC ₁₆	36,000 (169)	37,000	38,000
Aromatic hydrocarbons >EC ₁₆ -EC ₂₁	28,000	28,000	28,000
Aromatic hydrocarbons >EC ₂₁ -EC ₂₅	28,000	28,000	28,000
Aromatic hydrocarbons >EC ₂₅ -EC ₄₄	28,000	28,000	28,000
Minerals			
Asbestos	Stage 1 test – No asbestos detected with ID; Stage 2 test - <0.001% dry weight (exceedance of either equates to an exceedance of the GAC) ¹		
Notes:			
^{1/2} Generic assessment criteria not calculated owing to low volatility of substance and therefore no pathway, or an absence of toxicological data.			
NR - SAC for 1,3,5-trimethylbenzene is not recorded owing to the lack of toxicological data. SAC for 1,2,4 trimethylbenzene may be used			
EC - equivalent carbon, GrAC - groundwater assessment criteria, SAC - soil assessment criteria			
* The GAC for Phenol is based on a threshold which is protective of direct contact (SC050021/Phenol SGV report)			
** Denoted SAC calculated exceeds 100% contaminant, hence 100% (1,000,000mg/kg) has been taken as SAC			
The SAC for organic compounds are dependent on Soil Organic Matter (SOM) (%) content. To obtain SOM from total organic carbon (TOC) (%) divide by 0.58.			
1% SOM is 0.58% TOC. DL Rowell Soil Science: Methods and Applications, Longmans, 1994.			
SAC for TPH fractions, PAHs naphthalene, acenaphthene and acenaphthylene, BTEX and trimethylbenzene compounds were produced using an attenuation factor for the indoor air inhalation pathway of 10 to reduce conservatism associated with the vapour inhalation pathway; section 10.1.1, SR3.			
(VALUE IN BRACKETS)			
RSK has adopted an approach for petroleum hydrocarbons in accordance with LQM/CIH whereby the concentration modelled for each petroleum hydrocarbon fraction has been tabulated as the SAC with the corresponding solubility or vapour saturation limits given in brackets.			

Appendix K

GENERIC ASSESSMENT CRITERIA FOR PHYTOTOXIC EFFECTS

APPENDIX K

GENERIC ASSESSMENT CRITERIA FOR PHYTOTOXIC EFFECTS

Several compounds can inhibit plant growth; hence it is important to have generic assessment criteria (GAC) to promote healthy plant growth. In the absence of other published GAC, the GAC have been obtained from legislation (UK and European) and guidance related to the use of sewage sludge on agricultural fields.

The Council of European Communities Sewage Sludge Directive (86/278/EEC) dated 1986, has been transposed into UK law by Statutory Instrument No. 1263, The Sludge (use in Agriculture) Regulations 1989 (Public Health England, Wales and Scotland), as amended in 1990 and The Sludge (use in Agriculture) Regulations (Northern Ireland) SR No, 245, 1990. In addition the Department of Environment (DoE) produced a Code of Practice (CoP) (Updated 2nd Edition) in 2006 which provided guidance on the application of sewage sludge on agricultural land (however the status of this document is unclear as it is on the archive section of the Defra website).

The directive seeks to encourage the use of sewage sludge in agriculture and to regulate its use in such a way as to “**prevent harmful effects on soil, vegetation, animals and man**”. To this end, it prohibits the use of untreated sludge on agricultural land unless it is injected or incorporated into the soil. Treated sludge is defined as having undergone “biological, chemical or heat treatment, long-term storage or any other appropriate process so as significantly to reduce its fermentability and the health hazards resulting from its use”. To provide protection against potential health risks from residual pathogens, sludge must not be applied to soil in which fruit and vegetable crops are growing, or less than ten months before fruit and vegetable crops are to be harvested. Grazing animals must not be allowed access to grassland or forage land less than three weeks after the application of sludge.

The specified limits of concentrations of selected elements in soil are presented in Table 4 of the updated 2nd Edition of the DoE Code of Practice and are designed to protect plant growth. It is noted that these values are more stringent than the values set in current UK regulations. However since they were amended following recommendations from the Independent Scientific Committee in 1993. (MAFF/DOE 1993). The GAC are presented in Table 1.

Table 1: Generic assessment criteria

Determinant	Generic assessment criteria (mg/kg)			
	pH 5.0 < 5.5	pH 5.5 < 6.0	pH 6.0 < 7.0	pH >7.0
Zinc	200	200	200	300
Copper	80	100	135	200
Nickel	50	60	75	110
Lead	300	300	300	300
Cadmium	3	3	3	3
Mercury	1	1	1	1
Note: Only compounds with assessment criteria documented within the Directive 86/278/EEC have been included, although criteria for 5 additional compounds have been presented within the 2006 CoP.				

Appendix L

GENERIC ASSESSMENT CRITERIA POTABLE WATER SUPPLY PIPES

A range of pipe materials is available and careful selection, design and installation is required to ensure that water supply pipes are satisfactorily installed and meet the requirements of the Water Supply (Water Fittings) Regulations 1999 in England and Wales, the Byelaws 2000 in Scotland and the Northern Ireland Water Regulations. The regulations include a requirement to use only suitable materials when laying water pipes and laying water pipes without protection is not permitted at contaminated sites. The water supply company has a statutory duty to enforce the regulations.

Contaminants in the ground can pose a risk to human health by permeating potable water supply pipes. To fulfil their statutory obligation, UK water supply companies require robust evidence from developers to demonstrate either that the ground in which new plastic supply pipes will be laid is free from specific contaminants, or that the proposed remedial strategy will mitigate any existing risk. If these requirements cannot be demonstrated to the satisfaction of the relevant water company, it becomes necessary to specify an alternative pipe material on the whole development or in specific zones.

In 2010, UK Water Industry Research (UKWIR) published *Guidance for the Selection of Water Supply Pipes to be used in Brownfield Sites* (Report Ref. No. 10/WM/03/21). This report reviewed previously published industry guidelines and threshold concentrations adopted by individual water supply companies.

The focus of the UKWIR research project was to develop clear and concise procedures, which provide consistency in the pipe selection decision process. It was intended to provide guidance that can be used to ensure compliance with current regulations and to prevent water supply pipe failing prematurely due to the presence of contamination.

The report concluded that in most circumstances only organic contaminants pose a potential risk to plastic pipe materials and Table 3.1 of the report provides threshold concentrations for polyethylene (PE) and polyvinyl chloride (PVC) pipes for the organic contaminants of concern. The report also makes recommendations for the procedures to be adopted in the design of site investigations and sampling strategies, and the assessment of data, to ensure that the ground through which water supply pipes will be laid is adequately characterised.

Risks to water supply pipes have therefore been assessed against the threshold concentrations for PE and PVC pipe specified in Table 3.1 of Report 10/WM/03/21, which have been adopted as the GAC for this linkage and are reproduced in Table A3 below.

Since water supply pipes are typically laid at a minimum depth of 0.75m below finished ground levels, sample results from depths between 0.5m and 1.5m below finished level are generally considered suitable for assessing risks to water supply. Samples outside these depths can be used, providing the stratum is the same as that in which water supply pipes are likely to be located. The report specifies that sampling should characterise the ground conditions to a minimum of 0.5m below the proposed depth of the pipe.

It should be noted that the assessment provided in this report is a guide and the method of assessment and recommendations should be checked with the relevant water supply company.

Table Q1: Generic assessment criteria for water supply pipes

		Pipe material	
		GAC (mg/kg)	
	Parameter group	PE	PVC
1	Extended VOC suite by purge and trap or head space and GC-MS with TIC (Not including compounds within group 1a)	0.5	0.125
1a	BTEX + MTBE	0.1	0.03
2	SVOCs TIC by purge and trap or head space and GC-MS with TIC (aliphatic and aromatic C ₅ –C ₁₀) (Not including compounds within group 2e and 2f)	2	1.4
2e	Phenols	2	0.4
2f	Cresols and chlorinated phenols	2	0.04
3	Mineral oil C ₁₁ –C ₂₀	10	Suitable
4	Mineral oil C ₂₁ –C ₄₀	500	Suitable
5	Corrosive (conductivity, redox and pH)	Suitable	Suitable
Specific suite identified as relevant following site investigation			
2a	Ethers	0.5	1
2b	Nitrobenzene	0.5	0.4
2c	Ketones	0.5	0.02
2d	Aldehydes	0.5	0.02
6	Amines	Not suitable	Suitable
Notes: where indicated as 'suitable', the material is considered resistant to permeation or degradation and no threshold concentration has been specified by UKWIR.			

Appendix M

GENERIC ASSESSMENT TABLES

Job Number:
Client:
Site:

Revised Wilson and Card Classification Ground Gas Risk Assessment

Job No.:	52511
Client:	Furness Partnership Limited
Site:	Gravel/lean Leasure Centre

For low-rise residential developments without a clear ventilated sub-floor void, flats and commercial / Industrial sites

Characteristic Situation	Risk	GSV
1	Very Low	0.07
2	Low	0.7
3	Moderate	3.5
4	Moderate to High	15
5	High	70
6	Very High	>70

From Cllk Report 859 (2008) "Assessing Risks Posed By Hazardous Ground Gases To Buildings", Wilson et al.

KEY:	Gas Screening Value
GSV cannot be calculated on a site-specific basis	
GSV Indicates very low risk	
GSV Indicates low to moderate risk	
GSV Indicates moderate or greater risk; Concentrations of CH ₄ ≥20%v/v; CO ₂ ≥30%v/v	
Oxygen concentration ≤10%v/v	
Total ground gas concentrations >100%v/v	

BH NO.	DATE	CH ₄ I %v/v	CH ₄ SS %v/v	CO ₂ I %v/v	CO ₂ SS %v/v	O ₂ I %v/v	O ₂ SS %v/v	Flow l/hr	Baro mbar	BH Press mbar	I SUM %v/v	SS SUM %v/v	CH ₄	CO ₂	CS No.
BH1 (B)	31.03.2023	0.1	0.1	0.1	1.7	21.5	20.9	0	978	0.05	21.7	22.7	0.00	0.00	CS1
	06.04.2023	0.1	0.1	0.2	1.2	21.4	20.0	0.1	1005	0.07	21.7	21.3	0.00	0.00	CS1
	14.04.2023	0.1	<0.1	0.2	1.0	21.3	21.3	0.1	997	0.02	21.6	22.3	0.00	0.00	CS1
BH1 (D)	31.03.2023	0.2	0.1	0.1	2.1	21.3	18.8	0	979	0	21.6	21.0	0.00	0.00	CS1
	06.04.2023	0.1	0.1	0.2	1.0	21.2	20.3	0.2	1006	0.07	21.5	21.4	0.00	0.00	CS1
	14.04.2023	<0.1	<0.1	0.1	1.1	21.3	20.1	0.1	996	0.05	21.4	21.2	0.00	0.00	CS1
WS4	31.03.2023	<0.1	<0.1	0.4	1.2	21.1	19.1	0	979	0.11	21.5	20.3	0.00	0.00	CS1
	06.04.2023	0.1	<0.1	0.3	1.4	21.1	19.9	0	1000	0.02	21.5	21.3	0.00	0.00	CS1
	14.04.2023	<0.1	<0.1	0.2	1.1	21.2	19.6	0.1	996	0.02	21.4	20.7	0.00	0.00	CS1
BH3	31.03.2023	<0.1	<0.1	0.1	2.5	21.2	18.8	0	979	0.04	21.3	21.3	0.00	0.00	CS1
	06.04.2023	<0.1	<0.1	0.3	1.9	20.8	18.4	0.1	1000	0.02	21.2	21.3	0.00	0.00	CS1
	14.04.2023	<0.1	<0.1	0.2	0.9	21.2	20.4	0.1	990	0.07	21.4	21.3	0.00	0.00	CS1
WS3	31.03.2023	<0.1	<0.1	0.4	1.8	21.3	19.5	0.1	979	-0.02	21.7	21.6	0.00	0.00	CS1
	06.04.2023	<0.1	<0.1	0.1	1.7	21.1	20.0	0.1	1000	0.09	21.2	21.7	0.00	0.00	CS1
	14.04.2023	<0.1	<0.1	0.2	1.4	21.2	19.8	0	996	0.09	21.4	21.0	0.00	0.00	CS1
BH2	31.03.2023	<0.1	<0.1	0.2	0.6	21.2	19.9	0.1	979	0.05	21.5	20.5	0.00	0.00	CS1
	06.04.2023	0.1	<0.1	0.1	0.7	21.6	20.0	0.1	1000	0.02	21.6	20.7	0.00	0.00	CS1
	14.04.2023	<0.1	<0.1	0.1	0.6	21.8	20.6	0	997	0.11	21.9	21.2	0.00	0.00	CS1
WS2	31.03.2023	<0.1	<0.1	0.2	0.2	21.6	21.7	0	979	0.07	21.8	21.9	0.00	0.00	CS1
	06.04.2023	<0.1	<0.1	0.2	0.9	21.3	21.1	0	1000	-0.04	21.5	22.0	0.00	0.00	CS1
	14.04.2023										0.0	0.0	0.00	0.00	CS1
WS1	31.03.2023	<0.1	<0.1	0.1	1.2	21.8	21.1	0.1	979	-0.04	21.9	22.3	0.00	0.00	CS1
	06.04.2023	<0.1	<0.1	0.1	1.4	21.3	18.9	0.1	1000	-0.05	21.4	20.3	0.00	0.00	CS1
	14.04.2023	<0.1	<0.1	0.2	0.7	21.5	21.3	0.2	996	0	21.7	22.0	0.00	0.00	CS1
WS6	31.03.2023	<0.1	<0.1	0.2	2.1	21.7	20.1	0.1	979	0.11	21.9	22.2	0.00	0.00	CS1
	06.04.2023	<0.1	<0.1	0.2	2.3	21.2	20.6	0.1	1000	0.02	21.4	22.9	0.00	0.00	CS1
	14.04.2023	<0.1	<0.1	0.1	1.5	21.5	19.5	0.1	996	0.02	21.6	21.0	0.00	0.00	CS1
WS5	31.03.2023	<0.1	<0.1	0.3	1.7	21.8	19.9	0.1	979	0.09	21.9	21.6	0.00	0.00	CS1
	06.04.2023	<0.1	<0.1	0.2	1.6	21.4	19.5	0.1	1000	0.09	21.6	21.2	0.00	0.00	CS1
	14.04.2023	<0.1	<0.1	0.2	1.6	21.5	19.3	0.1	996	-0.02	21.7	20.9	0.00	0.00	CS1

WORST-CASE VALUES PER BOREHOLE

	Maximum CH ₄	Maximum CO ₂	Minimum O ₂	Max Flow	Not Applicable	Maximum Total	Maximum GSVs	CS No.
BH1 (B)	0.1	0.1	0.2	1.7	21.3	20.0	0.1	CS1
BH1 (D)	0.2	0.1	0.2	2.1	21.2	18.8	0.2	CS1
WS4	0.1	<0.1	0.4	1.4	21.1	19.1	0.1	CS1
BH3	<0.1	<0.1	0.3	2.5	20.9	18.8	0.1	CS1
WS3	<0.1	<0.1	0.4	1.8	21.1	19.6	0.1	CS1
BH2	0.1	<0.1	0.2	0.7	21.3	19.9	0.1	CS1
WS2	<0.1	<0.1	0.2	1.4	21.3	18.9	0.2	CS1
WS1	<0.1	<0.1	0.2	1.4	21.3	18.9	0.2	CS1
WS6	<0.1	<0.1	0.2	2.3	21.2	19.5	0.1	CS1
WS5	<0.1	<0.1	0.3	1.7	21.4	19.3	0.1	CS1

Project nameGravesham Leisure Centre

Project code52511

Client nameFurness Partnership

AddressCascades Leisure Centre, Thong Lane, Gravesend, Kent

NGR

Land usePhytotoxic (pH >7.0)

SOM1%

GAC version2012_01

Notes



Lab sample ID 23/02978/1										23/02978/14	23/02978/15	23/02978/16	23/02978/17	23/02978/18	23/02978/8	23/02978/9	23/02978/10	23/02978/11
Client sample ID BHL										HP1	HP2	HP3	HP4	HP5	SA1	SA2	SA2	SA3
Depth to top										0.05	0	0	0.2	0	0	0	0.2	0
Depth to bottom										0.3	0.3	0.4	0.3	0.3	0.2	0.2	0.4	0.3
Date sampled										17/03/23	24/03/23	24/03/23	23/02/23	23/03/23	23/03/23	20/03/23	20/03/23	21/03/23
Analyte	Unit	GAC	T1	Max	Min	Count	# Detects	# Non-detects										
Metals and Inorganics																		
Arsenic	mg/kg			10	<1	18	16	2	<1	7	4	7	5	6	10	<1	3	8
Cadmium	mg/kg				0.6	18	18	0	0.7	2.7	2.6	2	1.4	1.9	2.4	0.6	1.5	0.7
Chromium	mg/kg			117	10	18	18	0	10	36	29	21	21	117	28	20	41	23
Chromium (hexavalent)	mg/kg				<1	5	0	5	<1						<1	<1	<1	
Copper	mg/kg	200		115	7	18	18	0	7	115	42	16	76	38	84	63	36	16
Lead	mg/kg	300		229	3	18	18	0	3	229	67	161	33	108	114	15	90	43
Mercury	mg/kg				<0.17	18	10	8		0.36								<0.17
Nickel	mg/kg	110		36	4	18	18	0	4	29	23	16	19	19	35	36	29	15
Selenium	mg/kg				<1	18	0	18	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Zinc	mg/kg					35	18	18	0	36			182	116		157	35	94
Asbestos																		
Asbestos in soil										18	0	18	NAD	NAD	NAD	NAD	NAD	NAD
Petroleum Hydrocarbons																		
Ali >C5-C6	mg/kg				<0.01	18	0	18	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Ali >C6-C8	mg/kg				<0.01	18	0	18	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Ali >C8-C10	mg/kg				<1	18	0	18	<10	<1	<1	<1	<1	<1	<10	<10	<10	<1
Ali >C10-C12	mg/kg				<1	18	0	18	<10	<1	<1	<1	<1	<1	<10	<10	<10	<1
Ali >C12-C16	mg/kg				1	<1	18	1	17	<10	<1	<1	<1		1	<10	<10	<1
Ali >C16-C21	mg/kg				11	<1	18	6	12	<10		2	<1	<1	4	<10	<10	11
Ali >C21-C35	mg/kg				253	6	18	18	0	84	200	54	10	11	164	103	253	78
Ali >C16-C35 calculated	mg/kg				253	6	18	18	0	84	202	56	10	11	168	103	253	89
Total Aliphatics	mg/kg				253	6	18	18	0	84	203	56	10	11	169	103	253	89
Aro >C5-C7	mg/kg				<0.01	18	0	18	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Aro >C7-C8	mg/kg				<0.01	18	0	18	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Aro >C8-C10	mg/kg				2	<1	18	1	17	<10	<1	<1	<1	<1	2	<10	<10	<1
Aro >C10-C12	mg/kg				4	<1	18	1	17	<10	<1	<1	<1	<1	4	<10	<10	<1
Aro >C12-C16	mg/kg				108	<1	18	12	6	<10		8	2	3	7	20	13	108
Aro >C16-C21	mg/kg				801	1	18	17	1	<10		110	5	5	18	56	77	801
Aro >C21-C35	mg/kg				1510	6	18	18	0	53	308	17	17	41	286	282	242	1510
Total Aromatics	mg/kg				2420	9	18	18	0	53	426	25	24	62	355	379	313	2420
TPH (Ali & Aro)	mg/kg				2510	16	18	18	0	137	629	81	34	73	524	482	566	2510
BTEX - Benzene	mg/kg				<0.01	18	0	18	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
BTEX - Toluene	mg/kg				<0.01	18	0	18	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
BTEX - Ethyl Benzene	mg/kg				<0.01	18	0	18	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
BTEX - o Xylene	mg/kg				<0.01	18	0	18	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
BTEX - m & p Xylene	mg/kg				<0.01	18	0	18	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
TPH total (>C6-C40)	mg/kg				1990	384	3	3	0							384	1560	1990
TPH ID (for FID characterisation)							3									C12-C44 with C10-C44 with some PAHs as		
TPH FID Chromatogram							3									Appended	Appended	Appended
Fuel oxygenates																		
MTBE	mg/kg				<0.01	18	0	18	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

Project name	Gravesham Leisure Centre													
Project code	52511													
Client name	Furness Partnership													
Address	Cascades Leisure Centre, Thong Lane, Gravesend, Kent													
NGR														
Land use	Phytotoxic (pH >7.0)													
SOM	1%													
GAC version	2012_01													
Lab sample ID 23/02978/12 23/02978/13 23/02978/2 23/02978/3 23/02978/4 23/02978/5 23/02978/6 23/02978/7														
Client sample ID TP1 TP2 WS1 WS2 WS3 WS4 WS5 WS6														
Depth to top 0 0 0 0 0 0 0 0.1														
Depth to bottom 0.3 0.1 0.3 0.3 0.3 0.3 0.4 0.3														
Date sampled 21/03/23 21/03/23 16/03/23 16/02/23 16/03/24 16/02/24 16/03/25 16/02/25														
Analyte	Unit	GAC	T1	Max	Min	Count	# Detects	# Non-detect						
Metals and inorganics														
Arsenic	mg/kg			10	<1	18	16	2	8	6	9	7	2	5
Cadmium	mg/kg			16	0.6	18	18	0	1.2	1	1.7	1	0.9	1.1
Chromium	mg/kg			117	10	18	18	0	36	23	26	32	34	35
Chromium (hexavalent)	mg/kg				<1	5	0	5					<1	
Copper	mg/kg	200		115	7	18	18	0	15	17	40	20	16	17
Lead	mg/kg	300		229	3	18	18	0	35	26	34	60	48	39
Mercury	mg/kg			1.1	<0.17	18	10	8	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17
Nickel	mg/kg	110		36	4	18	18	0	26	18	28	21	17	25
Selenium	mg/kg				<1	18	0	18	<1	<1	<1	<1	<1	<1
Zinc	mg/kg			100	35	18	18	0	100	69	76	88	97	93
Asbestos														
Asbestos in soil						18	0	18	NAD	NAD	NAD	NAD	NAD	NAD
Petroleum Hydrocarbons														
Ali <C5-C6	mg/kg				<0.01	18	0	18	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Ali <C6-C8	mg/kg				<0.01	18	0	18	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Ali <C8-C10	mg/kg				<1	18	0	18	<1	<1	<1	<1	<1	<1
Ali <C10-C12	mg/kg				<1	18	0	18	<1	<1	<1	<1	<1	<1
Ali <C12-C16	mg/kg				1	<1	18	1	17	<1	<1	<1	<1	<1
Ali <C16-C21	mg/kg				11	<1	18	6	12	<1	<1	<1	<1	<1
Ali <C21-C35	mg/kg				253	6	18	18	0	6	9	14	10	9
Ali <C16-C35 calculated	mg/kg				253	6	18	18	0	6	9	14	10	9
Total Aliphatics	mg/kg				253	6	18	18	0	6	9	14	10	9
Aro <C5-C7	mg/kg				<0.01	18	0	18	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Aro <C7-C8	mg/kg				<0.01	18	0	18	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Aro <C8-C10	mg/kg				2	<1	18	1	17	<1	<1	<1	<1	<1
Aro <C10-C12	mg/kg				4	<1	18	1	17	<1	<1	<1	<1	<1
Aro <C12-C16	mg/kg				108	<1	18	12	6	<1	<1	<1	<1	<1
Aro <C16-C21	mg/kg				801	1	18	17	1	2	3	2	4	4
Aro <C21-C35	mg/kg				1510	6	18	18	0	11	6	11	17	16
Total Aromatics	mg/kg				2420	9	18	18	0	13	9	13	22	20
TPH (Ali & Aro)	mg/kg				2510	16	18	18	0	19	18	27	32	28
BTEX - Benzene	mg/kg				<0.01	18	0	18	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
BTEX - Toluene	mg/kg				<0.01	18	0	18	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
BTEX - Ethyl Benzene	mg/kg				<0.01	18	0	18	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
BTEX - o Xylene	mg/kg				<0.01	18	0	18	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
BTEX - m & p Xylene	mg/kg				<0.01	18	0	18	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
TPH total (>C6-C40)	mg/kg				1990	384	3	3	0					
TPH ID (for FID characterisations)							3		id other unknown hydrocarbons					
TPH FID Chromatogram							3							
Fuel oxygenates														
MTBE	mg/kg				<0.01	18	0	18	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

Lab sample ID 23/02978/1																							23/02978/14	23/02978/15	23/02978/16	23/02978/17	23/02978/18	23/02978/8	23/02978/9	23/02978/10	23/02978/11
Client sample ID BH1										HP1	HP2	HP3	HP4	HP5	SA1	SA2	SA2	SA3													
Depth to top										0.05	0	0	0.2	0	0	0	0	0.2	0												
Depth to bottom										0.3	0.3	0.4	0.3	0.3	0.2	0.2	0.4	0.3													
Date sampled										17/03/23	24/03/23	24/03/23	23/02/23	23/03/23	23/03/23	20/03/23	20/03/23	20/03/23	21/03/23												
Analyte	Unit	GAC	T1	Max	Min	Count	# Detects	# Non-detects																							
Polycyclic aromatic hydrocarbons																															
Acenaphthene	mg/kg			1.08	<0.01	18	8	10	<0.01		0.07	<0.01	<0.01		0.03	0.04	0.32	0.42	1.08	<0.01											
Acenaphthylene	mg/kg			0.7	<0.01	18	7	11	<0.01		0.04	<0.01	<0.01	<0.01		0.03	0.14	0.7	0.27	<0.01											
Anthracene	mg/kg			3.71	<0.02	18	10	8	<0.02		0.3	<0.02		0.03	0.05	0.11	1.36	2.39	3.71	0.02											
Benzo(a)anthracene	mg/kg			11.1	<0.04	18	17	1	<0.04		1.31	0.07	0.09	0.18	0.87	2.94	6.29	11.1	0.18												
Benzo(a)pyrene	mg/kg			7.89	<0.04	18	17	1	<0.04		1.04	0.07	0.11	0.16	1.02	2.67	4.19	7.89	0.17												
Benzo(b)fluoranthene	mg/kg			9.12	<0.05	18	17	1	<0.05		1.32	0.11	0.14	0.22	1.42	3.37	5.43	9.12	0.23												
Benzo(g,h)perylene	mg/kg			3.85	<0.05	18	14	4	0.06		0.57	<0.05		0.1	0.11	0.89	1.54	2.55	3.85	0.11											
Benzo(k)fluoranthene	mg/kg			3.37	<0.07	18	9	9	<0.07		0.42	<0.07	<0.07		0.08	0.54	1.09	1.86	3.37	0.08											
Chrysene	mg/kg			10	<0.06	18	16	2	<0.06		1.28	0.11	0.1	0.21	1.19	2.95	5.87	10	0.21												
Dibenz(a,h)anthracene	mg/kg			0.88	<0.04	18	6	12	<0.04		0.12	<0.04	<0.04	<0.04		0.13	0.31	0.59	0.88	<0.04											
Fluoranthene	mg/kg			27	<0.08	18	17	1	<0.08		3.07	0.21	0.17	0.44	2.48	8.15	14.6	27	0.41												
Fluorene	mg/kg			0.89	<0.01	18	8	10	<0.01		0.08	<0.01	<0.01		0.02	0.02	0.47	0.51	0.89	<0.01											
Indeno(123-cd)pyrene	mg/kg			4.64	<0.03	18	16	2	<0.03		0.67	0.05	0.1	0.12	0.86	1.73	2.89	4.64	0.11												
Naphthalene	mg/kg			0.14	<0.03	18	4	14	<0.03		0.14	<0.03	<0.03	<0.03	<0.03	0.03	0.04	0.09	<0.03												
Phenanthrene	mg/kg			16.1	<0.03	18	17	1	<0.03		1.46	0.1	0.08	0.27	0.72	5.93	8.28	16.1	0.13												
Pyrene	mg/kg			23.3	<0.07	18	17	1	<0.07		2.56	0.19	0.15	0.39	2.23	6.77	13.5	23.3	0.36												
Total PAH-16MS	mg/kg			123	<0.08	18	17	1	<0.08		14.4	0.91	1.07	2.28	12.6	39.8	70.1	123	2.01												
Volatile Organic Compounds (VOC)																															
1,1,1,2-Tetrachloroethane	mg/kg				<0.001	1	0	1	<0.001																						
1,1,1-Trichloroethane	mg/kg				<0.001	1	0	1	<0.001																						
1,1,2,2-Tetrachloroethane	mg/kg				<0.001	1	0	1	<0.001																						
1,1,2-Trichloroethane	mg/kg				<0.001	1	0	1	<0.001																						
1,1-Dichloroethane	mg/kg				<0.001	1	0	1	<0.001																						
1,1-Dichloroethene	mg/kg				<0.001	1	0	1	<0.001																						
1,1-Dichloropropene	mg/kg				<0.001	1	0	1	<0.001																						
1,2,3-Trichlorobenzene	mg/kg				<0.003	1	0	1	<0.003																						
1,2,3-Trichloropropane	mg/kg				<0.001	1	0	1	<0.001																						
1,2,4-Trichlorobenzene	mg/kg				<0.003	1	0	1	<0.003																						
1,2,4-Trimethylbenzene	mg/kg				<0.001	1	0	1	<0.001																						
1,2-Dibromo-3-chloropropane	mg/kg				<0.003	1	0	1	<0.003																						
1,2-Dibromoethane	mg/kg				<0.001	1	0	1	<0.001																						
1,2-Dichlorobenzene	mg/kg				<0.001	1	0	1	<0.001																						
1,2-Dichloroethane	mg/kg				<0.003	1	0	1	<0.003																						
1,2-Dichloropropane	mg/kg				<0.001	1	0	1	<0.001																						
1,3,5-Trimethylbenzene	mg/kg				<0.001	1	0	1	<0.001																						
1,3-Dichlorobenzene	mg/kg				<0.001	1	0	1	<0.001																						
1,3-Dichloropropane	mg/kg				<0.001	1	0	1	<0.001																						
1,4-Dichlorobenzene	mg/kg				<0.001	1	0	1	<0.001																						
2,2-Dichloropropane	mg/kg				<0.001	1	0	1	<0.001																						
2-Chlorotoluene	mg/kg				<0.001	1	0	1	<0.001																						
4-Chlorotoluene	mg/kg				<0.001	1	0	1	<0.001																						
4-Isopropyltoluene	mg/kg				<0.001	1	0	1	<0.001																						
Benzene	mg/kg				<0.001	1	0	1	<0.001																						
Bromobenzene	mg/kg				<0.001	1	0	1	<0.001																						
Bromochloromethane	mg/kg				<0.005	1	0	1	<0.005																						
Bromodichloromethane	mg/kg				<0.01	1	0	1	<0.01																						
Bromoform	mg/kg				<0.001	1	0	1	<0.001																						
Bromomethane	mg/kg				<0.001	1	0	1	<0.001																						
Carbon Disulphide	mg/kg				<0.001	1	0	1	<0.001																						
Carbon Tetrachloride	mg/kg				<0.001	1	0	1	<0.001																						
Chlorobenzene	mg/kg				<0.001	1	0	1	<0.001																						
Chloroethane	mg/kg				<0.001	1	0	1	<0.001																						
Chloroform	mg/kg				<0.001	1	0	1	<0.001																						

Lab sample ID 23/02978/12 23/02978/13 23/02978/2 23/02978/3 23/02978/4 23/02978/5 23/02978/6 23/02978/7												
Client sample ID TP1 TP2 WS1 WS2 WS3 WS4 WS5 WS6												
Depth to top 0 0 0 0 0 0 0 0												
Depth to bottom 0.3 0.1 0.3 0.3 0.3 0.3 0.4 0.3												
Date sampled 21/03/23 21/03/23 16/03/23 16/02/23 16/03/24 16/02/24 16/03/25 16/02/25												
Analyte	Unit	GAC	T1	Max	Min	Count	# Detects	# Non-dete				
Polycyclic aromatic hydrocarbons												
Acenaphthene	mg/kg			1.08	<0.01	18	8	10	<0.01	<0.01	<0.01	0.01
Acenaphthylene	mg/kg			0.7	<0.01	18	7	11	<0.01	<0.01	0.01	<0.01
Anthracene	mg/kg			3.71	<0.02	18	10	8	<0.02	<0.02	<0.02	0.06
Benzo(a)anthracene	mg/kg			11.1	<0.04	18	17	1	0.05	0.06	0.14	0.12
Benzo(a)pyrene	mg/kg			7.89	<0.04	18	17	1	0.05	0.06	0.18	0.14
Benzo(b)fluoranthene	mg/kg			9.12	<0.05	18	17	1	0.07	0.09	0.23	0.19
Benzo(g,h)perylene	mg/kg			3.85	<0.05	18	14	4	<0.05	<0.05	0.16	0.1
Benzo(k)fluoranthene	mg/kg			3.37	<0.07	18	9	9	<0.07	<0.07	<0.07	0.09
Chrysene	mg/kg			10	<0.06	18	16	2	<0.06	0.08	0.17	0.16
Dibenz(a,h)anthracene	mg/kg			0.88	<0.04	18	6	12	<0.04	<0.04	<0.04	0.15
Fluoranthene	mg/kg			27	<0.08	18	17	1	0.12	0.13	0.26	0.3
Fluorene	mg/kg			0.89	<0.01	18	8	10	<0.01	<0.01	<0.01	0.26
Indeno(123-cd)pyrene	mg/kg			4.64	<0.03	18	16	2	<0.03	0.05	0.16	0.1
Naphthalene	mg/kg			0.14	<0.03	18	4	14	<0.03	<0.03	<0.03	0.1
Phenanthrene	mg/kg			16.1	<0.03	18	17	1	0.04	0.05	0.07	0.11
Pyrene	mg/kg			23.3	<0.07	18	17	1	0.11	0.11	0.25	0.26
Total PAH-16MS	mg/kg			123	<0.08	18	17	1	0.44	0.53	1.53	1.48
Volatile Organic Compounds (VOC)												
1,1,1,2-Tetrachloroethane	mg/kg				<0.001	1	0	1				
1,1,1-Trichloroethane	mg/kg				<0.001	1	0	1				
1,1,2,2-Tetrachloroethane	mg/kg				<0.001	1	0	1				
1,1,2-Trichloroethane	mg/kg				<0.001	1	0	1				
1,1-Dichloroethane	mg/kg				<0.001	1	0	1				
1,1-Dichloroethene	mg/kg				<0.001	1	0	1				
1,1-Dichloropropene	mg/kg				<0.001	1	0	1				
1,2,3-Trichlorobenzene	mg/kg				<0.003	1	0	1				
1,2,3-Trichloropropane	mg/kg				<0.001	1	0	1				
1,2,4-Trichlorobenzene	mg/kg				<0.003	1	0	1				
1,2,4-Trimethylbenzene	mg/kg				<0.001	1	0	1				
1,2-Dibromo-3-chloropropane	mg/kg				<0.003	1	0	1				
1,2-Dibromoethane	mg/kg				<0.001	1	0	1				
1,2-Dichlorobenzene	mg/kg				<0.001	1	0	1				
1,2-Dichloroethane	mg/kg				<0.003	1	0	1				
1,2-Dichloropropane	mg/kg				<0.001	1	0	1				
1,3,5-Trimethylbenzene	mg/kg				<0.001	1	0	1				
1,3-Dichlorobenzene	mg/kg				<0.001	1	0	1				
1,3-Dichloropropane	mg/kg				<0.001	1	0	1				
1,4-Dichlorobenzene	mg/kg				<0.001	1	0	1				
2,2-Dichloropropane	mg/kg				<0.001	1	0	1				
2-Chlorotoluene	mg/kg				<0.001	1	0	1				
4-Chlorotoluene	mg/kg				<0.001	1	0	1				
4-Isopropyltoluene	mg/kg				<0.001	1	0	1				
Benzene	mg/kg				<0.001	1	0	1				
Bromobenzene	mg/kg				<0.001	1	0	1				
Bromochloromethane	mg/kg				<0.005	1	0	1				
Bromodichloromethane	mg/kg				<0.01	1	0	1				
Bromoform	mg/kg				<0.001	1	0	1				
Bromomethane	mg/kg				<0.001	1	0	1				
Carbon Disulphide	mg/kg				<0.001	1	0	1				
Carbon Tetrachloride	mg/kg				<0.001	1	0	1				
Chlorobenzene	mg/kg				<0.001	1	0	1				
Chloroethane	mg/kg				<0.001	1	0	1				
Chloroform	mg/kg				<0.001	1	0	1				

Lab sample ID 23/02978/1											23/02978/14	23/02978/15	23/02978/16	23/02978/17	23/02978/18	23/02978/8	23/02978/9	23/02978/10	23/02978/11
Client sample ID BH1											HP1	HP2	HP3	HP4	HP5	SA1	SA2	SA2	SA3
Depth to top											0.05	0	0	0.2	0	0	0	0.2	0
Depth to bottom											0.3	0.3	0.4	0.3	0.3	0.2	0.2	0.4	0.3
Date sampled											17/01/23	24/03/23	24/03/23	23/02/23	23/03/23	23/03/23	20/03/23	20/03/23	21/03/23
Analyte	Unit	GAC	T1	Max	Min	Count	# Detects	# Non-detects											
Chloromethane	mg/kg				<0.01	1	0	1	<0.01										
cis 1,2-Dichloroethene	mg/kg				<0.001	1	0	1	<0.001										
cis 1,3-Dichloropropene	mg/kg				<0.001	1	0	1	<0.001										
Dibromochloromethane	mg/kg				<0.003	1	0	1	<0.003										
Dibromomethane	mg/kg				<0.001	1	0	1	<0.001										
Dichlorodifluoromethane	mg/kg				<0.001	1	0	1	<0.001										
Dichloromethane	mg/kg				<0.005	1	0	1	<0.005										
Ethylbenzene	mg/kg				<0.001	1	0	1	<0.001										
Hexachlorobutadiene	mg/kg				<0.001	1	0	1	<0.001										
Isopropylbenzene	mg/kg				<0.001	1	0	1	<0.001										
m & p Xylene	mg/kg				<0.001	1	0	1	<0.001										
n-Butylbenzene	mg/kg				<0.001	1	0	1	<0.001										
n-Propylbenzene	mg/kg				<0.001	1	0	1	<0.001										
o-Xylene	mg/kg				<0.001	1	0	1	<0.001										
sec-Butylbenzene	mg/kg				<0.001	1	0	1	<0.001										
Styrene	mg/kg				<0.001	1	0	1	<0.001										
tert-Butylbenzene	mg/kg				<0.002	1	0	1	<0.002										
Tetrachloroethene	mg/kg				<0.001	1	0	1	<0.001										
Toluene	mg/kg				<0.001	1	0	1	<0.001										
trans 1,2-Dichloroethene	mg/kg				<0.001	1	0	1	<0.001										
trans 1,3-Dichloropropene	mg/kg				<0.001	1	0	1	<0.001										
Trichloroethene	mg/kg				<0.001	1	0	1	<0.001										
Trichlorofluoromethane	mg/kg				<0.001	1	0	1	<0.001										
Vinyl Chloride	mg/kg				<0.001	1	0	1	<0.001										
PCBs																			
PCB BZ 101	mg/kg				<0.004	1	0	1											
PCB BZ 105	mg/kg				<0.005	1	0	1											
PCB BZ 114	mg/kg				<0.005	1	0	1											
PCB BZ 118	mg/kg				<0.007	1	0	1											
PCB BZ 123	mg/kg				<0.005	1	0	1											
PCB BZ 126	mg/kg				<0.005	1	0	1											
PCB BZ 138	mg/kg				<0.006	1	0	1											
PCB BZ 153	mg/kg				<0.004	1	0	1											
PCB BZ 156	mg/kg				<0.005	1	0	1											
PCB BZ 157	mg/kg				<0.005	1	0	1											
PCB BZ 167	mg/kg				<0.005	1	0	1											
PCB BZ 169	mg/kg				<0.005	1	0	1											
PCB BZ 180	mg/kg				<0.004	1	0	1											
PCB BZ 189	mg/kg				<0.005	1	0	1											
PCB BZ 28	mg/kg				<0.003	1	0	1											
PCB BZ 52	mg/kg				<0.002	1	0	1											
PCB BZ 77	mg/kg				<0.005	1	0	1											
PCB BZ 81	mg/kg				<0.005	1	0	1											
Other analytes																			
% Moisture	% w/w				13.1	7.4	3	3	0								13.1	7.4	11
% Stones >10mm	% w/w				15.5	<0.1	18	8	10		6.4	<0.1	<0.1		15.1	9.6	10.9	3.1	<0.1
pH					9.69	6.07	18	18	0		9.49	8.14	7.7	9.69	8.54	8.39	8.64	8.91	8.59
Sulphate (acid soluble)	mg/kg				1300	310	18	17	1	<0.000		570	730	1100	700	540	580	360	1300
Sulphate (water sol 2:1)	g/l				0.06	<0.01	18	4	14		0.06	<0.01	<0.01		0.04	0.04	<0.01	<0.01	<0.01
Total Organic Carbon	% w/w				11.4	1.69	7	7	0								11.4		3.68
Converted to SOM (x / 0.58)	% w/w				19.65517	2.913793	7	7	0								19.6551724		6.34482759
Total Speciated PCB-EC7 & WHO12	mg/kg				<0.007		1	0	1										3.10344828

Lab sample ID 23/02978/12 23/02978/13 23/02978/2 23/02978/3 23/02978/4 23/02978/5 23/02978/6 23/02978/7									
Client sample ID TP1 TP2 WS1 WS2 WS3 WS4 WS5 WS6									
Depth to top 0 0 0 0 0 0 0 0.1 0									
Depth to bottom 0.3 0.1 0.3 0.3 0.3 0.3 0.4 0.4 0.3									
Date sampled 21/03/23 21/03/23 16/03/23 16/02/23 16/03/24 16/02/24 16/03/25 16/02/25									
Analyte	Unit	GAC	T1	Max	Min	Count	# Detects	# Non-dete	
Chloromethane	mg/kg				<0.01	1	0	1	
cis 1,2-Dichloroethene	mg/kg				<0.001	1	0	1	
cis 1,3-Dichloropropene	mg/kg				<0.001	1	0	1	
Dibromochloromethane	mg/kg				<0.003	1	0	1	
Dibromomethane	mg/kg				<0.001	1	0	1	
Dichlorodifluoromethane	mg/kg				<0.001	1	0	1	
Dichloromethane	mg/kg				<0.005	1	0	1	
Ethylbenzene	mg/kg				<0.001	1	0	1	
Hexachlorobutadiene	mg/kg				<0.001	1	0	1	
Isopropylbenzene	mg/kg				<0.001	1	0	1	
m & p Xylene	mg/kg				<0.001	1	0	1	
n-Butylbenzene	mg/kg				<0.001	1	0	1	
n-Propylbenzene	mg/kg				<0.001	1	0	1	
o-Xylene	mg/kg				<0.001	1	0	1	
sec-Butylbenzene	mg/kg				<0.001	1	0	1	
Styrene	mg/kg				<0.001	1	0	1	
tert-Butylbenzene	mg/kg				<0.002	1	0	1	
Tetrachloroethene	mg/kg				<0.001	1	0	1	
Toluene	mg/kg				<0.001	1	0	1	
trans 1,2-Dichloroethene	mg/kg				<0.001	1	0	1	
trans 1,3-Dichloropropene	mg/kg				<0.001	1	0	1	
Trichloroethene	mg/kg				<0.001	1	0	1	
Trichlorofluoromethane	mg/kg				<0.001	1	0	1	
Vinyl Chloride	mg/kg				<0.001	1	0	1	
PCBs									
PCB BZ 101	mg/kg				<0.004	1	0	1	
PCB BZ 105	mg/kg				<0.005	1	0	1	
PCB BZ 114	mg/kg				<0.005	1	0	1	
PCB BZ 118	mg/kg				<0.007	1	0	1	
PCB BZ 123	mg/kg				<0.005	1	0	1	
PCB BZ 126	mg/kg				<0.005	1	0	1	
PCB BZ 138	mg/kg				<0.006	1	0	1	
PCB BZ 153	mg/kg				<0.004	1	0	1	
PCB BZ 156	mg/kg				<0.005	1	0	1	
PCB BZ 157	mg/kg				<0.005	1	0	1	
PCB BZ 167	mg/kg				<0.005	1	0	1	
PCB BZ 169	mg/kg				<0.005	1	0	1	
PCB BZ 180	mg/kg				<0.004	1	0	1	
PCB BZ 189	mg/kg				<0.005	1	0	1	
PCB BZ 28	mg/kg				<0.003	1	0	1	
PCB BZ 52	mg/kg				<0.002	1	0	1	
PCB BZ 77	mg/kg				<0.005	1	0	1	
PCB BZ 81	mg/kg				<0.005	1	0	1	
Other analytes									
% Moisture	% w/w			13.1	7.4	3	3	0	
% Stones >10mm	% w/w			15.5	<0.1	18	8	10	2.3
pH	pH			9.69	6.07	18	18	0	6.9
Sulphate (acid soluble)	mg/kg			1300	310	18	17	1	520
Sulphate (water sol 2:1)	g/l			0.06	<0.01	18	4	14	<0.01
Total Organic Carbon	% w/w			11.4	1.69	7	7	0	2.9
Converted to SOM (x / 0.58)	% w/w			19.65517	2.913793	7	7	0	5
Total Speciated PCB-EC7 & WHO12	mg/kg				<0.007	1	0	1	3.05172414

Appendix N

WM3 ASSESSMENT



Date: _____

PAH (Input Total F

[available]

11. 441-442

REVISED

Table 3 of the CLP, CL Inventory, ATPs, IARC, Concasse, MSDSs, REACH + Pesticide Properties databases. Worst case REACH + MSDSs used for *** STOT + Acute Toxicity.



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Please enter available data in the rows associated with the test (grey) cells. Calculation cells initially display either "0.0000" or "#DIV/0!".
If any calculation cells below state "0.00000", testing has NOT been undertaken that contributes to that Hazardous Property.

BH1	WS1	WS2	WS3	WS4	WS5	WS6	SA1	SA2
0.05	0.00	0.00	0.00	0.00	0.10	0.00	0.00	0.00
	0.30	0.30	0.30	0.30	0.40	0.30	0.20	0.20
17-Mar-23	16-Mar-23	16-Feb-23	16-Mar-24	16-Feb-24	16-Mar-25	16-Feb-25	20-Mar-23	20-Mar-23

POPs Dioxins and Furans Input Total Dioxins and Furans OR individual Dioxin and Furan results.

2,3,7,8-TeCDD	mg/kg							
1,2,3,7,8-PeCDD	mg/kg							
1,2,3,4,7,8-HxCDD	mg/kg							
1,2,3,6,7,8-HxCDD	mg/kg							
1,2,3,7,8,9-HxCDD	mg/kg							
1,2,3,4,6,7,8-HpCDD	mg/kg							
OCDD	mg/kg							
2,3,7,8-TeCDF	mg/kg							
1,2,3,7,8-PeCDF	mg/kg							
2,3,4,7,8-PeCDF	mg/kg							
1,2,3,4,7,8-HxCDF	mg/kg							
1,2,3,6,7,8-HxCDF	mg/kg							
2,3,4,6,7,8-HxCDF	mg/kg							
1,2,3,7,8,9-HxCDF	mg/kg							
1,2,3,4,6,7,8-HpCDF	mg/kg							
OCDF	mg/kg							
Total Dioxins and Furans	mg/kg							

Some Pesticides (POPs unless otherwise stated)

Aldrin	mg/kg							
α Hexachlorocyclohexane (alpha-HCH) (leave empty if total HCH results used)	mg/kg							
β Hexachlorocyclohexane (beta-HCH) (leave empty if total HCH results used)	mg/kg							
α Cis-Chlordane (alpha) OR Total Chlordane	mg/kg							
δ Hexachlorocyclohexane (delta-HCH) (leave empty if total HCH results used)	mg/kg							
Dieldrin	mg/kg							
Endrin	mg/kg							
γ Hexachlorocyclohexane (gamma-HCH) (lindane) OR Total HCH	mg/kg							
Heptachlor	mg/kg							
Hexachlorobenzene	mg/kg							
o,p'-DDT (leave empty if total DDT results used)	mg/kg							
p,p'-DDT OR Total DDT	mg/kg							
γ Trans-Chlordane (gamma) (leave empty if total Chlordane results used)	mg/kg							
Chlordecone (kepone)	mg/kg							
Pentachlorobenzene	mg/kg							
Mirex	mg/kg							
Toxaphene (camphechlor)	mg/kg							
Tin								
Tin (leave empty if Organotin and Tin excl Organotin results used)	mg/kg							
Organotin								
Dibutyltin; DiBT	mg/kg							
Tributyltin; TriBT	mg/kg							
Triphenyltin; TriPT	mg/kg							
Tetrabutyltin; TeBT	mg/kg							
Tin excluding Organotin								
Tin excl Organotin	mg/kg							



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Please enter available data in the rows associated with the test (grey) cells. Calculation cells initially display either "0.0000" or "#DIV/0!".
If any calculation cells below state "0.00000", testing has NOT been undertaken that contributes to that Hazardous Property.

BH1	WS1	WS2	WS3	WS4	WS5	WS6	SA1	SA2
0.05	0.00	0.00	0.00	0.00	0.10	0.00	0.00	0.00
	0.30	0.30	0.30	0.30	0.40	0.30	0.20	0.20
17-Mar-23	16-Mar-23	16-Feb-23	16-Mar-24	16-Feb-24	16-Mar-25	16-Feb-25	20-Mar-23	20-Mar-23

Asbestos in Soil	Thresholds
Asbestos detected in Soil (enter Y or N)	Y
Asbestos % Composition in Soil (Matrix Loose Fibres or Microscopic Identifiable Pieces only)	see "Calc HP7 % Asbestos in Soil (Fibres)" below
Carcinogenic HP7 % Asbestos in Soil (fibres or micro pieces)	≥0.1%
Please be advised, if the calculation cell is "0.00000" DOES NOT MEAN asbestos testing has been undertaken and the result is zero.	

Asbestos identifiable Pieces visible with the naked eye detected in the Soil (enter Y or N)	Y
---	---

N	N	N	N	N	N	N	N	N
If Asbestos in Soil above is "Y", the soil is Hazardous Waste HP5 and HP7								
0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
If Asbestos in Soil above is "Y", but Asbestos % above is "<0.1%", the soil is Non Hazardous Waste. You can only use Asbestos % results where loose fibres or micro pieces are only present. You cannot use Asbestos % results when visual identifiable pieces are present.								

If visual identifiable pieces of asbestos are present, you cannot use Asbestos % results and the whole soil sample is Hazardous Waste HP5 and HP7. Construction material containing Asbestos 17 06 05. Therefore, if Asbestos in Soil above is "Y", the Asbestos % above is "<0.1%", but the Asbestos identifiable Pieces visible with the naked eye is "Y", the soil is Hazardous Waste.

Identifiable Pieces are Cement, Fragments, Board, Rope etc. ie anything ACM that is not Loose Fibres.

All visual asbestos pieces need to be removed leaving only fibres (or micro pieces) with an Asbestos % Composition in Soil result of <0.1% for the soil to become non-hazardous waste.

Hazardous Property	Thresholds	Cut Off Value
Corrosive HP8	≥5%	<1%
Irritant HP4	≥10%	<1%
Irritant HP4	≥20%	<1%
Specific Target Organ Toxicity HP5	≥1%	
Specific Target Organ Toxicity HP5	≥20%	
Specific Target Organ Toxicity HP5	≥1%	
Specific Target Organ Toxicity HP5	≥10%	
Aspiration Toxicity HP5	≥10%	
Acute Toxicity HP6	≥0.1%	<0.1%
Acute Toxicity HP6	≥0.25%	<0.1%
Acute Toxicity HP6	≥5%	<0.1%
Acute Toxicity HP6	≥25%	<1%
Acute Toxicity HP6	≥0.25%	<0.1%
Acute Toxicity HP6	≥2.5%	<0.1%
Acute Toxicity HP6	≥15%	<0.1%
Acute Toxicity HP6	≥50%	<1%
Acute Toxicity HP6	≥0.1%	<0.1%
Acute Toxicity HP6	≥0.5%	<0.1%
Acute Toxicity HP6	≥22.5%	<1%
Carcinogenic HP7	≥0.1%	
Carcinogenic HP7	≥1%	
Carcinogenic HP7 Unknown TPH with ID	≥1,000mg/kg	
Carcinogenic HP7 (bio) marker test (Unknown TPH with ID only) Cell only applicable if TPH > 1,000mg/kg	≥0.01%	
pH Corrosive HP8 pH (soil or leachate)	HB ≥11.5	
pH Corrosive HP8 pH (soil or leachate)	HB <2	
Toxic for Reproduction HP10	≥0.2%	
Toxic for Reproduction HP10	≥3%	
Mutagenic HP11	≥0.1%	
Mutagenic HP11 Unknown TPH with ID	≥1,000mg/kg	
Mutagenic HP11 (bio) marker test (Unknown TPH with ID only) Cell only applicable if TPH > 1,000mg/kg	≥0.01%	
Mutagenic HP11	≥1%	
Produces Toxic Gases HP12 Sulphide	≥1,400mg/kg	
Produces Toxic Gases HP12 Cyanide	≥1,200mg/kg	
Produces Toxic Gases HP12 Thiocyanate	≥2,500mg/kg	
HP13 Sensitising	≥10%	

If cells below turn yellow and the text turns red, the samples should be classified as Hazardous Waste.								
#VALUE!	0.00018	0.00707	0.00679	0.00738	0.00497	0.00866	0.00562	#VALUE!
#VALUE!	0.00571	0.00318	0.00207	0.00258	0.00324	0.00556	0.00940	#VALUE!
#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
0.00000	0.00001	0.00001	0.00001	0.00001	0.00003	0.00004	0.00052	0.00077
0.00192	0.00566	0.00614	0.00653	0.00672	0.00365	0.00787	0.00614	0.00673
#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.03337	0.14446
0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
0.00018	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	0.00007	0.00019
0.00192	0.00499	0.00614	0.00653	0.00672	0.00365	0.00787	0.00467	0.00356
0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
0.00007	0.00017	0.00010	0.00009	0.00011	0.00007	0.00134	0.00021	0.00006
0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
0.00217	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	0.00026	0.00507	0.00375
#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
0.00190	0.01358	0.01250	0.01004	0.01087	0.00864	0.01723	0.02430	0.01472
#VALUE!	0.00566	0.00614	0.00653	0.00672	0.00470	0.00787	0.03337	#VALUE!
0.000000000	0.000000000	0.000000000	0.000000000	0.000000000	0.000000000	0.000000000	0.000000000	0.000000000
0.00000	0.00002	0.00001	0.00001	0.00000	0.00003	0.00001	0.00015	0.00027
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9.49	8.19	7.86	8.09	6.07	8.02	8.10	8.64	8.91
9.49	8.19	7.86	8.09	6.07	8.02	8.10	8.64	8.91
0.00081	0.00566	0.00600	0.00480	0.00505	0.00470	0.00667	0.00991	0.00673
0.00192	0.00499	0.00614	0.00653	0.00672	0.00365	0.00787	0.03337	0.14446
0.00192	0.00499	0.00614	0.00653	0.00672	0.00365	0.00787	0.03337	0.14446
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
0.00081	0.00566	0.00424	0.00343	0.00505	0.00222	0.00667	0.00614	0.00673
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.00192	0.00566	0.00614	0.00653	0.00672	0.00365	0.00787	0.00614	0.00673



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Please enter available data in the rows associated with the test (grey) cells. Calculation cells initially display either "0.0000" or "#DIV/0!".
If any calculation cells below state "0.00000", testing has NOT been undertaken that contributes to that Hazardous Property.

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Ref. 1

Ref. 2

Date

BH1	WS1	WS2	WS3	WS4	WS5	WS6	SA1	SA2
0.05	0.00	0.00	0.00	0.00	0.10	0.00	0.00	0.00
	0.30	0.30	0.30	0.30	0.40	0.30	0.20	0.20
17-Mar-23	16-Mar-23	16-Feb-23	16-Mar-24	16-Feb-24	16-Mar-25	16-Feb-25	20-Mar-23	20-Mar-23

Ecotoxic HP14 amended v6	<20%	<0.1%	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
Ecotoxic HP14 amended v6	<20%	<0.1% (except Be, V, Ta, Ti, Petrol, Diesel, Crude Oil, Kerosene, White Spirit, Cresols, TPH, TPHCWG, Phenol, Cresols, Xylenols, T- Phenols, CompCN, Thiocyanate, Toluene, Ethylbenzene, Xylene + BTEX 1%).	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
Ecotoxic HP14 amended v6	<20%	<0.1% (except Be, V, Ta, Ti, Petrol, Diesel, Crude Oil, Kerosene, White Spirit, Cresols, TPH, TPHCWG, Phenol, Cresols, Xylenols, T- Phenols, CompCN, Thiocyanate, Toluene, Ethylbenzene, Xylene + BTEX 1%).	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
Persistent Organic Pollutant (PCB, PBB or POP Pesticides)	<0.005%		0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
Persistent Organic Pollutant (Total Dioxins+Furans)	<0.0000015%		0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000
Persistent Organic Pollutant (Individual Dioxins+Furans)	<0.0000015%		0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000	0.0000000000

- dermal contact with soil both indoors and outdoors
- indoor air inhalation from soil and vapour and outdoor inhalation of soil and vapour.

With respect to volatilisation, the CLEA model assumes a simple linear partitioning of a chemical in the soil between the sorbed, dissolved and vapour phase⁽⁹⁾. The upper boundaries of this partitioning are represented by the maximum aqueous solubility and pure saturated vapour concentration of the chemical. The CLEA model estimates saturated soil concentrations where these limits are reached⁽⁹⁾. The CLEA software uses a traffic light system to identify when individual and/or combined assessment criteria exceed the lower of either the aqueous- or vapour-based soil saturation limits. Model output cells are flagged red where the saturated soil concentration has been exceeded and the contribution of the indoor and outdoor vapour pathway to total exposure is greater than 10%. In this case, further consideration of the following is required⁽⁹⁾:

- Free phase contamination may be present.
- Exposure from the vapour pathways will be over-predicted by the model, as in reality the vapour phase concentration will not increase at concentrations above saturation limits
- Where the vapour pathway contribution is greater than 90%, it is unlikely the relevant health criteria value (HCV) will be exceeded at soil concentrations at least a factor of ten higher than the relevant HCV.

Where the vapour pathway is the predominant pathway (contributes greater than 90% of exposure) or the only exposure route considered and the cell is highlighted red (SAC exceeds saturation limit), the risk based on the assumed conceptual model is likely to be negligible as the vapour risk is assumed to be tolerable at maximum possible soil concentrations. In such circumstances, the vapour pathway exposure should be considered based on the presence of free phase or non-aqueous phase liquid sources and the measured concentrations of volatile organic compounds (VOC) in the vapour phase. Screening could be considered based on setting the SAC as the modelled soil saturation limits. However, as stated within the CLEA handbook⁽⁹⁾, this is likely to not be practical in many cases because of the very low saturation limits and, in any case, is highly conservative.

It should also be noted that for mixtures of compounds, free phase may be present where soil (or groundwater) concentrations are well below saturation limits for individual compounds.

Where the vapour pathway is only one of the exposure pathways considered, an additional approach can then be utilised as detailed within Section 4.12 of the CLEA model handbook⁽⁹⁾, which explains how to calculate an effective assessment criterion manually.

SR3⁽⁵⁾ states that, as a general rule of thumb, it is recognised that estimating vapour phase concentrations from dissolved and sorbed phase contamination by petroleum hydrocarbons are at least a factor of ten higher than those likely to be measured on-site. RSK has therefore applied an empirical subsurface to indoor air correction factor of 10 into the CLEA model chemical database for all petroleum hydrocarbon fractions (including BTEX, trimethylbenzenes and the polycyclic aromatic hydrocarbons (PAH) naphthalene, acenaphthene and acenaphthylene) to reduce this conservatism.

Input selection

The most up-to-date published chemical and toxicological data was obtained from EA Report SC050021/SR7⁽¹⁰⁾, the EA TOX⁽¹¹⁾ reports, the C4SL SP1010 project report and associated chemical specific reports^(3,6), the 2015 LQM/CIEH report⁽⁷⁾ or the USEPA IRIS database⁽¹⁴⁾. Where a LLTC^(3,6) has been published for a substance, RSK has used these input parameters to derive the RSK GAC. Toxicological and specific chemical parameters for 1,2,4-trimethylbenzene, barium, methyl tertiary-butyl ether (MTBE), 1,1,2-trichloroethane, 1,1-dichloroethene, 1,2-dichloropropane, 2-chloronaphthalene, chloroethane, chloromethane, cis 1,2-dichloroethene, dichloromethane, hexachloroethane and trans 1,2-dichloroethene were obtained from the CL:AIRE Soil Generic Assessment Criteria report⁽¹¹⁾.

For TPH, aromatic hydrocarbons C₅–C₈ were not modelled, as this range comprises benzene (>EC5-EC7) and toluene (>EC7-EC8), which are modelled separately.

Physical parameters

For the commercial end use, the CLEA default pre-1970s three-storey office building was used. SR3⁽⁵⁾ notes this commercial building type to be the most conservative in terms of protection from vapour intrusion. The default input building parameters presented in Table 3.10 of SR3⁽⁵⁾ have been used.

The parameters for a sandy loam soil type were used in line with Table 4.4 of SR3⁽⁵⁾. This includes a value of 6% for the percentage of soil organic matter (SOM) within the soil. In RSK's experience, this is rather high for many sites. To avoid undertaking site-specific risk assessments for this SOM, RSK has produced an additional set of GAC for SOM of 1% and 2.5% for all substances using the CLEA tool.

Summary of modifications to the default CLEA SR3⁽⁵⁾ input parameters for a commercial land use

In summary, the RSK commercial GAC were produced using the default input parameters for soil properties, the air dispersion model, building properties and the vapour model detailed in SR3⁽⁵⁾. Modifications to the default SR3⁽⁵⁾ exposure scenarios based on the C4SL exposure scenarios⁽³⁾ are presented in Table 2 below. The sole modification to the default commercial input parameters is the updated inhalation rate.

The final selected GAC are presented by pathway in Table 3 with the combined GAC in Table 4.

Figure 1: Conceptual model for CLEA commercial scenario

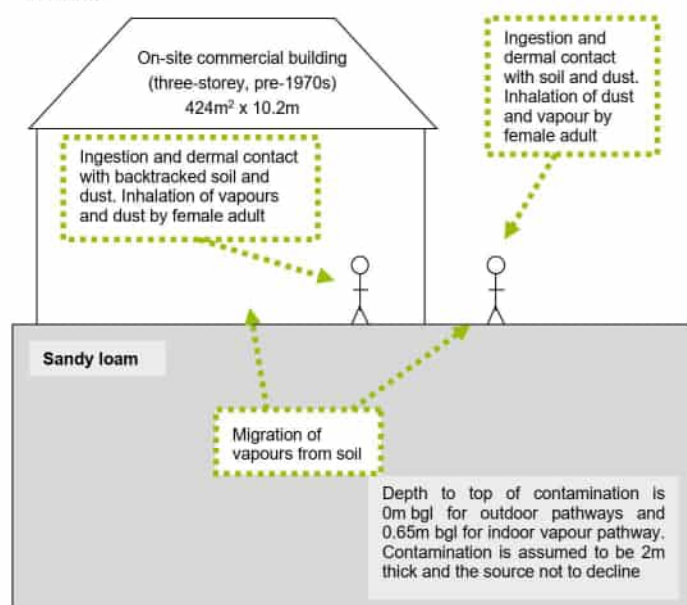


Table 1: Exposure assessment parameters for commercial scenario – inputs for CLEA model

Parameter	Value	Justification
Land use	Commercial	Chosen land use
Receptor	Female worker	Taken as female adult exposed over 49 years from age 16 to 65 years, Box 3.5, SR3 ⁽⁵⁾
Building	Office (pre-1970)	Key generic assumption given in Box 3.5, SR3 ⁽⁵⁾ . Pre-1970s three-storey office building chosen as it is the most conservative in terms of protection from vapour intrusion (Section 3.4.6, SR3 ⁽⁵⁾)
Soil type	Sandy loam	Most common UK soil type (Section 4.3.1, Table 4.4, SR3 ⁽⁵⁾)
Start age class (AC)	17	AC corresponding to key generic assumption that the critical receptor is a working female adult exposed over a 49-year period from age 16 to 65 years. Assumption given in Box 3.5, SR3 ⁽⁵⁾
End AC	17	
SOM (%)	6	Representative of sandy loam according to EA guidance note dated January 2009 entitled 'Changes We Have Made to the CLEA Framework Documents' ⁽¹³⁾
	1	To provide SAC for sites where SOM < 6% as often observed by RSK
	2.5	
pH	7	Model default

Table 2: Commercial – modified receptor inputs

Parameter	Unit	Value	Justification
Inhalation rate (AC17)	m ³ day ⁻¹	15.7	Mean value USEPA, 2011 ⁽¹²⁾ ; Table 3.2, SP1010 ⁽³⁾

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3. Contaminated Land: Applications in Real Environment (CL:AIRE) (2014). 'Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination', Revision 2, DEFRA research project SP1010.
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8. Environment Agency (2009), *Human health toxicological assessment of contaminants in soil. Science Report – Final SC050021/SR2* (Bristol: Environment Agency).
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GENERIC ASSESSMENT CRITERIA FOR HUMAN HEALTH - COMMERCIAL



Table 3
Human health generic assessment criteria by pathway for commercial scenario

Compound	Route	SAC appropriate to pathway SOM 1% (mg/kg)			Self saturation limit (mg/kg)	SAC appropriate to pathway SOM 2.5% (mg/kg)			Self saturation limit (mg/kg)	SAC appropriate to pathway SOM 5% (mg/kg)			Self saturation limit (mg/kg)
		Oral	Inhalation	Combined		Oral	Inhalation	Combined		Oral	Inhalation	Combined	
Metals													
Arsenic	(a,b)	6.35E+03	1.35E+03	NR	NR	6.35E+03	1.35E+03	NR	NR	6.35E+03	1.35E+03	NR	NR
Barium	(b)	2.21E+04	NR	NR	NR	2.21E+04	NR	NR	NR	2.21E+04	NR	NR	NR
Beryllium		3.97E+03	1.17E+01	NR	NR	3.97E+03	1.17E+01	NR	NR	3.97E+03	1.17E+01	NR	NR
Boron		2.38E+05	2.92E+07	NR	NR	2.38E+05	2.92E+07	NR	NR	2.38E+05	2.92E+07	NR	NR
Cadmium	(a)	7.73E+02	6.57E+02	6.58E+02	NR	7.73E+02	6.57E+02	6.58E+02	NR	7.73E+02	6.57E+02	6.58E+02	NR
Chromium (III) - trivalent	(c)	3.31E+05	6.57E+03	NR	NR	3.31E+05	6.57E+03	NR	NR	3.31E+05	6.57E+03	NR	NR
Chromium (VI) - hexavalent	(a,b)	6.62E+02	4.91E+01	NR	NR	6.62E+02	4.91E+01	NR	NR	6.62E+02	4.91E+01	NR	NR
Copper		1.89E+05	6.96E+04	6.63E+04	NR	1.89E+05	6.96E+04	6.63E+04	NR	1.89E+05	6.96E+04	6.63E+04	NR
Lead	(a)	2.53E+05	NR	NR	NR	2.53E+05	NR	NR	NR	2.53E+05	NR	NR	NR
Elemental Mercury (Hg ⁰)	(d)	NR	1.94E+01	NR	4.21E+00	NR	3.98E+01	NR	1.07E+01	NR	6.80E+01	NR	2.58E+01
Inorganic Mercury (Hg ²⁺)		1.18E+03	1.97E+04	1.13E+03	NR	1.18E+03	1.97E+04	1.13E+03	NR	1.18E+03	1.97E+04	1.13E+03	NR
Methyl Mercury (Hg ⁺)		3.38E+02	2.13E+03	2.93E+02	7.33E+01	3.38E+02	3.87E+03	3.11E+02	1.42E+02	3.38E+02	7.33E+03	3.23E+02	3.04E+02
Nickel	(a)	3.92E+03	6.83E+02	NR	NR	3.92E+03	6.83E+02	NR	NR	3.92E+03	6.83E+02	NR	NR
Selenium	(b)	1.23E+04	NR	NR	NR	1.23E+04	NR	NR	NR	1.23E+04	NR	NR	NR
Vanadium		2.12E+04	3.18E+03	NR	NR	2.12E+04	3.18E+03	NR	NR	2.12E+04	3.18E+03	NR	NR
Zinc	(b)	7.28E+05	1.37E+06	NR	NR	7.28E+05	1.37E+06	NR	NR	7.28E+05	1.37E+06	NR	NR
Cyanide (free)		6.56E+02	7.43E+04	6.56E+02	NR	6.56E+02	7.43E+04	6.56E+02	NR	6.56E+02	7.43E+04	6.56E+02	NR
Volatile Organic Compounds													
Benzene	(a)	1.09E+03	2.79E+01	2.72E+01	1.22E+02	1.09E+03	6.19E+01	4.36E+01	2.26E+02	1.09E+03	1.09E+02	3.86E+01	4.71E+03
Toluene		4.24E+05	6.69E+04	6.69E+04	8.89E+02	4.24E+05	1.43E+05	1.07E+05	1.92E+03	4.24E+05	3.24E+05	1.84E+05	4.36E+05
Ethylbenzene		1.91E+05	5.99E+03	5.71E+03	5.19E+02	1.91E+05	1.38E+04	1.28E+04	1.22E+03	1.91E+05	3.21E+04	2.75E+04	2.84E+05
Xylene - m		3.43E+05	6.26E+03	6.19E+03	6.29E+02	3.43E+05	1.47E+04	1.41E+04	1.47E+03	3.43E+05	3.44E+04	3.12E+04	3.46E+05
Xylene - o		3.43E+05	6.79E+03	6.69E+03	4.79E+02	3.43E+05	1.57E+04	1.50E+04	1.12E+03	3.43E+05	3.69E+04	3.30E+04	2.62E+05
Xylene - p		3.43E+05	6.03E+03	5.92E+03	5.76E+02	3.43E+05	1.41E+04	1.36E+04	1.36E+03	3.43E+05	3.28E+04	3.00E+04	3.17E+05
Total xylene		3.43E+05	6.03E+03	5.92E+03	6.25E+02	3.43E+05	1.41E+04	1.36E+04	1.47E+03	3.43E+05	3.28E+04	3.00E+04	3.46E+05
Methyl tertiary-butyl ether (MTBE)		5.72E+05	7.54E+02	7.46E+01	2.64E+04	5.72E+05	1.23E+04	1.21E+04	3.31E+04	5.72E+05	2.34E+04	2.24E+04	6.77E+04
1,1,1,2-Tetrachloroethane		1.10E+04	1.09E+02	1.08E+03	2.60E+03	1.10E+04	2.53E+02	2.47E+03	6.03E+03	1.10E+04	6.99E+03	6.99E+03	1.69E+04
1,1,2,2-Tetrachloroethane		1.10E+04	2.81E+02	2.74E+02	2.67E+03	1.10E+04	5.73E+02	5.46E+02	8.46E+03	1.10E+04	1.36E+03	1.13E+03	1.20E+04
1,1,1-Trichloroethane		1.14E+06	6.60E+02	6.60E+03	1.43E+03	1.14E+06	1.25E+03	1.33E+03	2.10E+03	1.14E+06	2.94E+03	2.55E+03	6.09E+03
1,1,2-Trichloroethane		7.62E+03	9.02E+01	6.91E+01	4.03E+03	7.62E+03	1.84E+02	1.80E+02	8.21E+03	7.62E+03	4.02E+02	3.82E+02	1.80E+04
1,1-Dichloroethane		8.76E+04	2.43E+01	2.43E+01	2.23E+03	8.76E+04	4.36E+01	4.36E+01	3.94E+03	8.76E+04	6.69E+01	6.67E+01	7.94E+03
1,2-Dichloroethane		2.29E+02	6.73E+01	6.71E+01	3.41E+03	2.29E+02	3.71E+01	6.67E+01	4.91E+03	2.29E+02	1.67E+01	1.63E+01	8.43E+03
1,2,4-Trimethylbenzene		NR	3.98E+02	NR	4.74E+02	NR	6.44E+02	NR	1.16E+03	NR	1.64E+03	NR	2.18E+03
1,3,5-Trimethylbenzene	(a)	NR	NR	NR	2.30E+02	NR	NR	NR	6.02E+02	NR	NR	NR	1.30E+03
1,2-Dichloropropane		2.57E+04	3.14E+00	3.13E+00	1.19E+03	2.57E+04	5.54E+00	5.54E+00	2.11E+03	2.57E+04	1.71E+01	1.71E+01	4.24E+03
Carbon Tetrachloride (tetrachloroethane)		7.62E+03	2.97E+01	2.87E+00	1.62E+03	7.62E+03	6.29E+01	6.29E+01	3.22E+03	7.62E+03	1.49E+01	1.42E+01	7.54E+03
Chloroethane		NR	6.03E+02	NR	2.61E+03	NR	1.23E+03	NR	3.54E+03	NR	1.97E+03	NR	3.71E+03
Chloroethane		NR	3.94E+01	NR	1.91E+03	NR	3.13E+00	NR	2.54E+03	NR	1.49E+00	NR	2.39E+03
Gas 1,2-Dichloroethane		1.98E+01	NR	NR	3.94E+03	2.29E+01	NR	NR	6.13E+03	4.44E+01	NR	NR	1.29E+04
Dichloromethane		8.94E+03	2.63E+02	2.57E+02	2.72E+03	8.94E+03	1.02E+02	3.39E+02	8.88E+03	8.94E+03	5.53E+02	5.53E+02	1.53E+04
Tetrachloroethane (PCE)		2.67E+04	2.45E+01	2.44E+01	4.24E+02	2.67E+04	5.49E+01	5.48E+01	9.13E+02	2.67E+04	1.38E+02	1.38E+02	2.38E+03
Trans 1,2-Dichloroethane		1.23E+04	2.57E+01	NR	3.43E+03	5.23E+04	3.74E+01	NR	6.17E+02	3.23E+04	7.63E+01	NR	1.25E+04
Trichloroethane (TCE)		7.36E+01	2.59E+00	NR	3.54E+03	1.33E+00	5.43E+00	NR	3.22E+03	3.38E+03	1.25E+01	NR	7.14E+03
Vinyl Chloride (acetylene)		1.19E+02	1.19E+00	1.12E+00	1.36E+03	1.19E+02	1.44E+00	1.45E+00	1.78E+03	1.19E+02	2.24E+00	2.29E+00	2.83E+03
Semi-Volatile Organic Compounds													
2-Chloronaphthalene		1.93E+05	3.71E+02	3.70E+02	1.14E+02	1.93E+05	9.07E+02	9.03E+02	2.80E+02	1.93E+05	2.13E+03	2.10E+03	6.69E+02
Acenaphthene		1.59E+05	2.75E+06	1.66E+05	5.79E+01	1.59E+05	5.36E+06	1.38E+05	1.61E+02	1.59E+05	6.93E+06	1.66E+05	3.96E+02

Table 3
Human health generic assessment criteria by pathway for commercial scenario

Compound	Route	SAC appropriate to pathway SOM 1% (mg/kg)			Soil saturation limit (mg/kg)	SAC appropriate to pathway SOM 2.5% (mg/kg)			Soil saturation limit (mg/kg)	SAC appropriate to pathway SOM 6% (mg/kg)			Soil saturation limit (mg/kg)
		Oral	Inhalation	Combined		Oral	Inhalation	Combined		Oral	Inhalation	Combined	
Acenaphthylene		1.10E+00	2.68E+06	1.05E+05	8.81E+01	1.10E+00	5.23E+06	1.07E+05	2.12E+02	1.10E+00	8.50E+06	1.08E+05	3.03E+02
Acridene		5.40E+00	1.13E+07	5.23E+05	1.17E+00	5.40E+00	2.38E+07	5.38E+05	2.91E+00	5.40E+00	4.13E+07	5.42E+05	6.96E+00
Benz[a]anthracene		2.84E+02	4.08E+02	1.67E+02	1.71E+00	2.84E+02	4.47E+02	1.74E+02	4.28E+00	2.84E+02	4.67E+02	1.76E+02	1.03E+01
Benz[a]pyrene	(a)	7.68E+01	2.04E+02	5.58E+01	9.11E+01	7.68E+01	2.09E+02	5.61E+01	2.28E+00	7.68E+01	2.11E+02	5.63E+01	5.46E+00
Benz[b]fluoranthene		7.13E+01	1.17E+02	4.43E+01	1.22E+00	7.13E+01	1.20E+02	4.47E+01	3.04E+00	7.13E+01	1.21E+02	4.49E+01	7.29E+00
Benz[k]fluoranthene		6.29E+03	1.05E+04	3.55E+03	1.54E+02	6.29E+03	1.06E+04	3.59E+03	3.85E+02	6.29E+03	1.07E+04	3.59E+03	9.23E+02
Benz[ghi]perylene		1.88E+03	3.11E+02	1.17E+03	6.87E+01	1.88E+03	3.17E+02	1.18E+03	1.72E+00	1.88E+03	3.21E+02	1.19E+03	4.12E+00
Chrysene		5.67E+02	8.88E+02	3.48E+02	4.40E+01	5.67E+02	9.29E+02	3.52E+02	1.19E+00	5.67E+02	9.47E+02	3.55E+02	3.64E+00
Dibenz[a,h]anthracene		5.67E+00	9.32E+00	3.33E+00	3.93E+03	5.67E+00	9.52E+00	3.55E+00	9.82E+03	5.67E+00	9.64E+00	3.57E+00	2.38E+02
Fluoranthene		2.29E+04	1.89E+06	2.26E+04	1.89E+01	2.29E+04	2.72E+06	2.27E+04	4.73E+01	2.29E+04	3.32E+06	2.27E+04	1.13E+02
Fluorene		7.31E+04	4.50E+05	6.30E+04	3.09E+01	7.31E+04	1.06E+06	6.84E+04	7.62E+01	7.31E+04	3.24E+06	7.09E+04	1.83E+02
Hexachlorobenzene		2.09E+01	NR	NR	8.17E+00	4.98E+01	NR	NR	2.01E+01	1.11E+02	NR	NR	4.81E+01
Indeno[1,2,3-cd]pyrene		8.10E+02	1.31E+02	5.01E+02	6.13E+02	8.10E+02	1.30E+03	5.06E+02	1.53E+01	8.10E+02	1.31E+03	5.09E+02	3.08E+01
Naphthalene		3.64E+04	1.87E+03	1.78E+03	7.64E+01	3.64E+04	4.39E+03	3.92E+03	1.83E+02	3.64E+04	9.94E+03	7.91E+03	4.32E+02
Phenanthrene		2.28E+04	5.32E+05	2.13E+04	3.60E+01	2.28E+04	1.00E+06	2.24E+04	8.96E+01	2.28E+04	1.06E+06	2.25E+04	2.04E+02
Pyrene		5.49E+04	4.47E+06	5.42E+04	2.20E+00	5.49E+04	6.40E+06	5.44E+04	5.49E+00	5.49E+04	7.91E+06	5.49E+04	1.33E+01
Retene		1.10E+06	2.63E+04	2.58E+04	2.42E+04	1.10E+06	3.04E+04	2.94E+04	3.81E+04	1.10E+06	3.40E+04	3.26E+04	7.03E+04
Total petroleum hydrocarbons													
Arenatics hydrocarbons >C9-EC8		4.77E+08	3.19E+03	3.19E+03	3.04E+02	4.77E+08	5.86E+03	5.86E+03	5.58E+02	4.77E+08	1.21E+04	1.21E+04	1.19E+03
Aliphatics hydrocarbons >C9-EC8		4.77E+08	7.19E+03	7.19E+03	1.44E+02	4.77E+08	1.74E+04	1.74E+04	3.22E+02	4.77E+08	3.97E+04	3.96E+04	7.86E+02
Arenatics hydrocarbons >C9-EC10		9.53E+04	2.02E+03	2.02E+03	7.77E+01	9.53E+04	9.91E+03	9.91E+03	1.82E+02	9.53E+04	1.17E+04	1.17E+04	4.51E+02
Aliphatics hydrocarbons >C9-EC12		9.53E+04	3.97E+03	3.97E+03	4.75E+01	9.53E+04	2.47E+04	2.29E+04	1.19E+02	9.53E+04	8.89E+04	4.72E+04	3.83E+02
Arenatics hydrocarbons >EC12-EC16		9.53E+04	8.36E+04	5.88E+04	2.37E+01	9.53E+04	2.04E+05	8.17E+04	5.91E+01	9.53E+04	4.81E+05	9.09E+04	1.42E+02
Aliphatics hydrocarbons >EC16-EC20	(b)	1.58E+06	NR	NR	8.48E+00	1.79E+06	NR	NR	2.12E+01	1.63E+06	NR	NR	5.09E+01
Aliphatics hydrocarbons >EC20-EC44	(b)	1.58E+06	NR	NR	8.48E+00	1.79E+06	NR	NR	2.12E+01	1.63E+06	NR	NR	5.09E+01
Aromatic hydrocarbons >EC8-EC16		3.81E+04	3.50E+02	3.44E+03	6.13E+02	3.81E+04	8.66E+03	8.11E+03	1.50E+03	3.81E+04	2.65E+04	1.79E+04	3.58E+03
Aromatic hydrocarbons >EC16-EC12		3.81E+04	1.90E+04	1.62E+04	3.64E+02	3.81E+04	4.69E+04	2.79E+04	8.99E+02	3.81E+04	1.10E+05	3.42E+04	2.19E+03
Aromatic hydrocarbons >EC12-EC16		3.81E+04	2.02E+05	3.62E+04	1.69E+02	3.81E+04	4.76E+05	3.73E+04	4.19E+02	3.81E+04	1.05E+06	3.78E+04	1.60E+03
Aromatic hydrocarbons >EC16-EC21	(c)	3.82E+04	NR	NR	5.27E+01	3.82E+04	NR	NR	6.34E+02	3.84E+04	NR	NR	3.21E+02
Aromatic hydrocarbons >EC21-EC35	(b)	2.84E+04	NR	NR	4.83E+00	2.84E+04	NR	NR	1.21E+01	2.84E+04	NR	NR	3.38E+01
Aromatic hydrocarbons >EC35-EC44	(b)	2.84E+04	NR	NR	4.83E+00	2.84E+04	NR	NR	1.21E+01	2.84E+04	NR	NR	3.38E+01

Notes:

EC - equivalent carbon; QAC - groundwater screening value; SAC - soil screening value

The CLEA model output is colour coded depending upon whether the soil saturation limit has been exceeded

	Calculated SAC exceeds soil saturation limit and may significantly affect the interpretation of any exceedances as the contribution of the indoor and outdoor vapour pathway to total exposure is >10%.
	Calculated SAC exceeds soil saturation limit but the exceedance will not affect the SAC significantly as the contribution of the indoor and outdoor vapour pathway to total exposure is <10%.
	Calculated SAC does not exceed the soil saturation limit.

The SAC for organic compounds are dependent upon soil organic matter (SOM) (%) content. To obtain SOM from total organic carbon (TOC) (%) divide by 0.58. 1% SOM is 0.58% TOC. DL Rowell Soil Science: Methods and Applications, Longmans, 1994.

SAC for TPH fractions, PAHs naphthalene, acenaphthene and acenaphthylene, BTEX and trimethylbenzene compounds were produced using an attenuation factor for the indoor air inhalation pathway of 10 to reduce conservatism associated with the vapour inhalation pathway (Section 10.1.1, SR3)

(a) SAC for arsenic, benzene, benzo[a]pyrene, cadmium, chromium VI and lead are derived using the CLEA toxicology data

(b) SAC for barium and selenium should not include the inhalation pathway as no expert group HCV has been derived; aliphatic and aromatic hydrocarbons >EC16 should not include inhalation pathway due to their non-volatile nature and inhalation exposure being minimal (oral, dermal and inhalation exposures is compared to the oral HCV); arsenic should only be based on oral contribution (rather than combined) owing to the relative small contribution from inhalation in accordance with the SOV report. The Oral SAC should be adopted for zinc and benzo[a]pyrene.

(c) SAC for OIB should be based on the lower of the oral and inhalation SAC (see LQMCEH 2015 Section 6.8)

(d) SAC for elemental mercury, chromium VI and nickel should be based on the inhalation pathway only.

(e) SAC for 1,3,5-trimethylbenzene is not recorded owing to the lack of toxicological data. SAC for 1,2,4-trimethylbenzene may be used.