

Your Ref:

Our Ref: BC643 L.01 / JT Rev A

Formation Design and Build
Oakwood House
414-422 Hackney Road
London
E2 7SY

For the attention of Lee Jones

3rd May 2023

Dear Lee

**LAND AT WATTS CLOSE N15 5DW
SUPPLEMENTARY SOIL CONTAMINATION AND GROUND GAS ASSESSMENT.**

1 INTRODUCTION

The Brownfield Consultancy was instructed by Formation Design and Build Ltd to undertake a Phase 2 supplementary land contamination investigation and gas risk assessment at the above site.

The Site is located on Watts Close, South Tottenham, London, N15 5DW. The Site covers an area of approximately 0.28 hectares and is roughly rectangular in shape with a north-eastern extension. The site was formerly occupied by several residential properties with front gardens, landscaped and hardstanding areas. The north-eastern extension was occupied by Lomond Hall, a community centre. A red line curtilage plan is presented below:-



Haringey Council granted Planning Permission for the redevelopment of the site comprising demolition of 11 existing bungalows and community building to deliver 18 new homes for council rent. The proposed development will comprise of six, two-storey family houses (three and four bedrooms) and 12 apartments (one and two bedrooms) in two, three-storey blocks including two wheelchair user dwellings (Planning Ref:- HGY/2022/2363).

A redevelopment layout is presented below:-



This report has been undertaken by a suitably qualified and competent professional in accordance with the following methodologies:-

- Environment Agency : Land Contamination Risk Assessment (LCRM).
- CLR 11 (Model Procedures for the Management of Land Contamination),
- Environment Agency Guidance for the Safe Development of Housing on Land Affected by Contamination (R&D Publication 66-2008)
- BS 10175 (Code of Practice for the Investigation of Potentially Contaminated Sites).
- CIRIA. (2007). C665, Assessing Risks Posed by hazardous ground gases to buildings.
- BS 8485 : 2015+A1:2019: Code of practice for the characterization and remediation from ground gas in affected developments.

Our report is subject to limitations which are set out in Appendix E.

Previous investigations have been undertaken at the site by Ecologia on behalf of Haringey Council and Pellings Ltd. Their findings are presented in the following section.

2 PREVIOUS WORK

Phase 1 Land Contamination Assessment

(Ecologia) Ref: EES 21.080.1 dated 26.11.21

British Geological Survey mapping indicates that the bedrock geology consists of London Clay Formation, which comprises of clay, silt and sand and is classified as 'Unproductive Strata' by the Environment Agency in terms of risks to controlled waters. There are no controlled surface waters within 1000m of the site.

Historically, the Site remained undeveloped until 1950 when a school and residential properties were constructed on-site. From approximately 1884, a railway cutting was present in the northern section of the Site. This was subsequently denoted as 'Dismantled' by 1967.

Sources of land-borne gas such as landfill sites are not located within 250m of the site. However, Ecologia identified land-borne gas as a potential risk, citing 'off-site' sources such as '*Current and / or historical surrounding land use (adjacent electrical substations, residential/properties surrounding, nearby railway cuttings/stations, schools/colleges, brickworks tramway, sawmills, factories, engineering/metal/timber works, unspecified tanks & pits)*'.

Ecologia recommended '*a Phase II intrusive investigation to assess underlying shallow ground conditions, presence of Made Ground, and potential contamination levels across the Site. This will consist of shallow sampling of the Made Ground to characterise soil conditions and to refine and further quantify potential risks to identified receptors. It is recommended that this sampling be completed as part of the development works following demolition*'.

Phase 2 Geo-Environmental Assessment

(Ecologia) Ref: EES 21.080.2 dated 26.11.21

Ecologia completed intrusive site investigation works on 5th October 2021 comprising 5No. windowless sampler boreholes (WS1-WS4 and WS3A) to depths of 5.45m bgl. London Clay was proven in all boreholes with the exception of WS3 which terminated on concrete cobbles at 0.70m bgl. The locations of the exploratory holes are denoted on the drawing below:-



Made Ground deposits comprised hardstanding over granular sub-base to a depth of 0.8m in the Watts Close area (WS1- WS3A) with deeper Made Ground comprising soft clay including glass being encountered to a depth of 2.3m in WS4 (Lomond Hall).

Eight samples of near surface soil were submitted to chemical analysis for metals, hydrocarbons, semi-volatile hydrocarbons and asbestos. Contaminant concentrations were all within acceptable limits for the proposed end use with the exception of the semi-volatile compounds benzo(a)anthracene, benzo(b)fluoranthene, benzo(a)pyrene and dibenz(a,h)anthracene. These concentrations were recorded in WS3A (0.40-0.50m) and WS4 (0.30 - 0.40m).

Ecologia made the following conclusions:-

- Deep Made Ground (2.3m) was encountered in the north-eastern corner of the site (Lomond Hall) in WS4. Elsewhere in the Watts Close area a maximum Made Ground thickness of 0.8m was recorded.
- No other visual or olfactory evidence of gross contamination (free product) was observed during the ground investigation and the maximum recorded in-situ VOC reading was 0.6ppm.
- Exceedances were identified for Residential with Home Grown Produce GACs in shallow Made Ground in WS3A (0.4-0.5m) and WS4 (0.3-0.4m). These exceedances generally related to PAHs including Benzo(a)anthracene, Benzo(b)fluoranthene, Benzo(a)pyrene and Dibenz(a,h)anthracene.
- Minor exceedances were identified for heavy metals in soil leachate samples when compared against current WQS within WS1, WS3A and WS4. However, given the London Clay bedrock is an Unproductive Aquifer and groundwater is at significant depth the risk to Surface Water/Controlled Waters is considered low.
- Remediation Strategy will be required to detail requirements to mitigate risks to Human Health from identified Made Ground contamination in the vicinity of WS3A and WS4. This will include further sampling within previously inaccessible areas and within proposed landscaped areas. This will confirm the requirement for clean capping across the Site.

Conclusions and Recommendations on land-borne gases were omitted.

Remediation Strategy

(Ecologia) Ref: EES 21.080.3 dated 11.03.22

In their Remediation Strategy Report, Ecologia summarised the findings of their two assessments and stated the following:-

In summary, based on the findings onsite to date, the remediation strategy will incorporate the following measures:

- The placement of suitable clean cover layer within any private gardens and soft landscaping areas in order to cut potential contamination pathways with respect to the underlying materials. •
- Areas of buildings and hard landscaping (including roads, public paved areas etc.) are expected to act as a physical barrier and cover system in their own right, therefore, no requirement for cover layer.
- Consultation with the water supply authority regarding suitable potable water supply pipe materials.
- Procedures to be followed should unexpected contamination be identified (Discovery Strategy).

The Lead Officer (Pollution) for Haringey Council did not concur with the recommendations, stating the following:-

- a) *There is a need for further site investigation as submitted in section 8 of the above Phase 2 report in order to fully evaluate the land contamination risk on the site and to determine the level of mitigation that will be required.*
- b) *With the identification of Low/Moderate ground gas accumulation (CH₄ and CO₂) within the area of Lomond Hall and others, a gas quantitative risk assessment more than the currently conducted qualitative risk assessment is required for the site in order to determine if there is going to be any need for gas mitigation or not. The current position of the applicant in the remedial strategy that none is required is not based on real quantitative risk assessment.*
- c) *Whilst the submitted remedial strategy is noted, this may need to be reviewed following the applicant undertaking of the above two outstanding issues. At any rate those works will need to have been carried out and verified before the strategy or the updated one can be considered for any aspect of the outstanding conditions 8b – d discharge.*

Formation Design and Build (the Client) commissioned the Brownfield Consultancy to undertake gas monitoring and further soil contamination testing in order to refine the Remediation Strategy. The works are discussed in the following sections.

3 FIELDWORK

The intrusive fieldwork was carried out on 17th November 2022 and comprised 7No. window sampler boreholes denoted WS101 – WS107 (incl.). The drilling technique utilises a lightweight tracked rig to advance the borehole in 1m lengths using 1m long steel sampler tubes containing plastic liners, into which the substrata deposits are driven, at diameters of 100mm reducing to 70mm. The soils are then recovered from each sampler tube as continuous core samples, which are then logged and sub-sampled on site.

The boreholes were advanced to depths of 3.00m (WS101 and WS102) and 1.00m (WS103 – WS107) using the dynamic windowless sampling technique.

Standpipes were installed in WS101 and WS102 to facilitate land-borne gas monitoring. The response zones were from 1.00m down to the base of the hole. Gas monitoring has been undertaken on three occasions.

The site work was undertaken by The Brownfield Consultancy, with the ground investigation procedures and sample descriptions based on BS 5930 (2020) 'Code of Practice for Site Investigations' and BS 10175 (2011) "Investigation of potentially contaminated sites - code of practice".

4 LABORATORY TESTING

Laboratory testing was scheduled to determine the chemistry of selected soil samples obtained from the investigation. All samples were transported to I2 in Watford which is accredited under UKAS and MCerts. The details of the testing are summarised in the following table:-

Summary of Chemical Laboratory Testing Suites

Determinant	No
CLEA Metals	8
16 USEPA PAHs	9
TPH Texas banded	4
Asbestos	5
TPH Total	5

5 GROUND CONDITIONS

The ground conditions encountered were consistent with the published geological map and the findings of the site investigation. A veneer of Made Ground overlies the London Clay.

A summary of the strata encountered during the investigation is described in the following sections, but for full details and descriptions, reference should be made to the exploratory hole records presented in Appendix B.

5.1 Made Ground

Made Ground was encountered in all borehole locations. The thickest sequence of 2.30m was encountered in WS101 (Lomond Hall), commensurate with Ecologia's WS4. Materials comprised 0.45m of sandy clayey GRAVEL & COBBLE of brick, concrete, breeze block paving slab and flint (imported Piling Mat). This was underlain by soft sandy gravelly, locally humic CLAY to 1.00m with gravel comprising red and yellow brick. A further unit of soft clay was encountered to 1.95m with rare

brick and ceramic tile. This in turn was underlain to 2.30m by a layer of chalk derived white SILT with thin bands of sand.

WS102 was located in the play area in the south of the site. We were informed by the site manager that this entire area is underlain by an attenuation tank. Thus, WS102 was located under the direction of the site manager. Granular materials associated with the imported piling mat were recorded to 0.60m which overlies 0.20m of soft brown and grey slightly gravelly CLAY, gravel comprising brick and flint. This thin (0.20m) unit of CLAY is considered to represent the original Made Ground profile, prior to the site being cleared.

Exploratory hole locations WS103 – WS107 were driven into the private and communal gardens along the northern boundary of the main site. At all of these locations, a unit of imported granular piling mat (0.30-0.40m) overlies a thin unit of grey and brown CLAY (0.05-0.20m) with variable proportions of sand and gravel. Again, this thin unit of CLAY is considered to represent the original Made Ground profile. Gravel comprised flint, brick, rare timber and rare chalk. This unit was targeted for chemical laboratory analysis.

5.2 London Clay

Underlying Made Ground, London Clay was encountered in all exploratory hole locations and comprised brown and grey silty CLAY.

5.3 Groundwater

Groundwater was not encountered in any of the exploratory holes.

5.4 Contamination

Visual and olfactory evidence of contamination was not recorded.

6 HUMAN HEALTH QUANTITATIVE RISK ASSESSMENT

Qualitative assessment of risks may be sufficient in many cases to eliminate the possibility of significant pollutant linkages. However, quantitative risk assessment is formally required to determine whether there is a 'significant possibility of significant harm being caused' (SPOSH). Part 2A of the Environmental Protection Act 1990 recommends that 'authoritative and scientifically based guideline values for concentrations of the potential pollutants in or under the land' be used to quantify the risk posed by contamination.

To determine whether land falls under the Part 2A definition of contaminated land the site should be evaluated in the context of a risk based framework. Land is only defined as 'Contaminated Land' if a "significant pollutant linkage" is present.

A pollutant linkage must comprise the following:-

Source - a contaminant at a concentration capable of causing adverse health or environmental effects.

Receptor - there must be a receptor (e.g. human, controlled waters, ecological or property) present, which may be at risk of harm or impact from the source.

Pathway - there must be an exposure pathway through which the receptor comes into contact with the contamination source.

Each of these elements can exist independently but they create risk only when they are linked together, so that a particular contaminant affects a particular receptor through a particular pathway.

6.1 Current UK Screening Values

The UK technical guidance for assessing risks to human health is issued from various UK bodies including the Environment Agency (EA), the DEFRA, Contaminated Land: Applications in Real Environment (CL:AIRE), Chartered Institute of Environmental Health (CIEH) and Land Quality Management (LQM) Ltd (part of the University of Nottingham).

New and updated screening values in the form of provisional Category four Screening Levels (C4SL) (published in 2014) and Suitable for Use Levels (S4UL) (published 2015) have been produced by DEFRA and CIEH / LQM respectively using modified versions of the EA's Contaminated Land Exposure Assessment (CLEA) software.

6.2 C4SL

Revision to the statutory guidance in 2012 presented a four category system for considering contaminated land under the Part 2A regime. The system comprises of four levels which range from category 4 where risk levels are considered acceptable (no risk of harm or possibility of significant harm) up to Category 1, where the risk of harm is unacceptably high. The decision to determine a site as contaminated land under Part 2A resides between Category 2 and Category 3.

The purpose of the C4SL is to provide a simple test for deciding that land is suitable for use and 'definitely not' contaminated land under Part IIA. They describe a level of risk that is above minimal but is still low.

Six contaminants have been assigned provisional C4SL: arsenic; benzene; benzo[a]pyrene; cadmium; chromium (VI) and lead for the standard land uses (residential with and without plant uptake, allotments, commercial and public open space (parks and residential)). It is noted that no values have been published for Category 3 to Category 1 and that if recorded, an exceedance of C4SL does not necessarily indicate SPOSH.

6.3 S4UL

The LQM / CIEH S4UL represent generic assessment criteria based on minimal or tolerable risk that are intended to be protective of human health. They represent values above which further assessment of the risks or remedial actions may be needed.

S4UL have been derived for a comprehensive list of organic and inorganic determinants.

7 SOIL CHEMISTRY

7.1 Results

The results of chemical testing of near surface soils are compared with the S4UL and C4SL for a 'residential with plant uptake' end use.

These comparisons are summarised in the following table. Exceedances are highlighted in bold:-

Comparison of Soil Chemical Test Results with Guideline Values

Determinant	Maximum Measured Concentration (mg/kg)	LQM/CIEH S4UL Residential with Plant Uptake (mg/kg)	No. of tests carried out	No. of exceedances
Arsenic	18	37	8	0
Cadmium	<dl	11	8	0
Chromium (total)	41	910	8	0
Mercury	1	1.2	8	0
Lead	350	200	8	3 exceedances
Nickel	38	180	8	0
Selenium	<dl	250	8	0
Copper	73	2400	8	0
Zinc	190	3700	8	0
Naphthalene	0.09	2.3	9	0
Acenaphthylene	0.37	170	9	0
Acenaphthene	0.26	210	9	0
Fluorene	0.29	170	9	0
Phenanthrene	0.39	95	9	0
Anthracene	1.2	2400	9	0
Fluoranthene	11	280	9	0
Pyrene	9.1	620	9	0
Benzo(a)anthracene	4.9	7.2	9	0
Chrysene	4.4	15	9	0
Benzo(b)fluoranthene	5.6	2.6	9	1 exceedance
Benzo(k)fluoranthene	2	77	9	0
Benzo(a)pyrene	5	2.2	9	1 exceedance
Indeno(1,2,3-c,d)pyrene	3.3	27	9	0
Dibenzo(a,h)anthracene	0.57	0.24	9	1 exceedance
Benzo(ghi)perylene	3.7	320	9	0

7.2 Interpretation – Metals

Exceedances of the acceptable guideline values for lead were recorded at the following locations. The soil description is included also:-

- 240mg/kg in WS105 (0.40m) - dark grey humic CLAY with black speckling. Possibly buried Tospoil. This is located below a Private Garden.
- 260mg/kg in WS106 (0.40m) - dark grey CLAY with yellow brick and small (<1cm) patches of weathered tarmac. This is located below a Private Garden.
- 350mg/kg in WS107 (0.35m) - red brown / brown CLAY. Gravel is angular red brick and rare subrounded chalk. This is located below Communal Landscaping.

It must be borne in mind that the C4SL are strongly precautionary, and the level of risk posed is considered to be extremely low. In addition, an exceedance of C4SL does not necessarily indicate a 'Significant Possibility of Significant Harm' (SPOSH). The decision to determine a site as 'contaminated land' (i.e. land that is causing harm) resides between Category 2 (C2SL) and Category 3 (C3SL) and to date DEFRA have not published values for C2SL and C3SL.

In addition, WS107 is a communal garden and thus the guideline values for lead of 330mg/kg for a 'residential without plant uptake' end use should be adopted. Again this has only been marginally exceeded.

7.3 Interpretation –Semi-Volatile Hydrocarbons

Exceedances of the guideline values for the PAH compounds benzo(b)fluoranthene, benzo(a)pyrene and dibenzo(a,h)anthracene were recorded in WS103 at 0.40m. The concentrations were not highly elevated and are listed in the table above. The Made Ground description is 'Stiff dark grey slightly sandy slightly gravelly CLAY with fine hair roots. Gravel is angular and subangular fine to coarse flint, rare yellow brick and fragments of coal. One piece of decomposed timber'. The marginal exceedances are attributed to coal fragments and are not considered a risk to human health.

7.4 Interpretation - Hydrocarbons

Visual and olfactory evidence of hydrocarbon contamination was not recorded during the intrusive investigation. 4No. samples of Made Ground were submitted to TPH Total and one sample of Made Ground was submitted to TPH Texas Banded. A maximum concentration of 210mg/kg was recorded in WS103 (0.40m). This sample also recorded the highest PAH results and again the TPH is attributed to coal. The remaining 4No. samples recorded concentrations <25mg/kg which is not considered a risk to human health.

Three samples of London Clay from WS102 (0.90m), WS103 (0.90m) and WS107 (0.85m) were submitted to TPH Texas Banded from depths of 0.85m-0.90m to determine the requirements for water supply pipe selection (WRAS). The concentrations were recorded at less than the laboratory detection limit. The sample from WS102 (0.90m) did record very minor concentrations of some individual PAH compounds. However, these are attributed to errant fragments of either coal or tarmac cross contaminating the sample. Thus, standard water supply pipework is deemed acceptable at this site. The site has not had a history of contaminative (hydrocarbon) use.

7.5 Interpretation - Asbestos

Five samples of Made Ground were submitted to an asbestos screen and asbestos was not recorded.

8 GAS PROTECTION REQUIREMENTS

8.1 Ground Gas

The current guidance on protecting buildings from ground gas hazards is contained in the document: CIRIA C665 with updated risk assessment guidance contained within BS8485 (2015). It is intended that the proposed new build will be residential houses.

The level of gas protection is determined by comparing the following parameters to cut-off values prescribed within BS8485 (2015):

- “Typical Maximum Concentrations” for initial screening purposes.
- Risk based “Gas Screening Values” (GSV) for consideration where the typical maximum concentrations are exceeded.

The GSV is calculated using the following equation and the resulting GSV are compared to the Site Characteristic GSV given in Table 2 of BS8485 (2015).

Maximum gas concentration (%) x worst case borehole flow rate (l/h)

The conceptual site model identified Made Ground associated with the former railway line as a potential source of land-borne gas. WS101 was installed into this ‘backfill’ and WS102 was installed in the communal play area in the south of the site. Three gas monitoring visits were undertaken. Methane was not recorded during any of the visits. Elevated concentrations of CO₂ were recorded.

The maximum CO₂ concentrations, the maximum flow rate and the screening values for the three boreholes during the fieldwork period are summarised in the following table:-

Calculated GSV

Location	Maximum CO ₂ Concentration (% v/v)	Maximum Flow Rate (l/hr)	Gas Screening Value (l/hr)
WS101	0.9	0.1	0.0009
WS102	0.1	0.1	0.0001

The ground investigation has identified a maximum carbon dioxide concentration of 0.9% vol. and a worst case flow rate of <0.1 l/hr, giving a maximum GSV of 0.0009 l/h. These values are then compared to Table 2 within BS8485.

8.2 Interpretation

Referring to Table 2 of BS8485 (2015), the site can be categorised as a Characteristic Situation 1 (CS1). Gas protection measures are not required.

9 CONCLUSIONS AND RECOMMENDATIONS

9.1 Contaminated Land

The contamination investigation has revealed the following:-

1. Low levels of soil contamination have been recorded during the supplementary investigation. Elevated concentrations of semi-volatile aromatic hydrocarbons were recorded by Ecologia in

two locations, WS3A (0.4-0.5m) and WS4 (0.3-0.4m). However, these areas will be capped by hard surfacings in the proposed development.

2. We would recommend that the existing soil / materials in gardens and public amenity areas are removed and replaced with clean imported soil. Soils below future hardstanding areas do not require removal.

Private gardens will require 600mm of removal and in public amenity landscaped areas, 450mm of removal. Imported soil should be placed on top of a geotextile 'marker' membrane.

Soils that are imported to site should be chemically validated as clean and conform to the acceptable guideline values in the table on Page 9. The soil should also be screened for asbestos. Source sampling prior to delivery should be undertaken at a ratio of one sample for every 100 m³ (approximately 150 tons) of material imported from a "greenfield" source or one sample for every 50 m³ for material from an unknown or potentially contaminated source.

In-situ validation of the placed topsoil is to be undertaken by the Brownfield Consultancy, comprising a series of hand dug pits to confirm the thickness of soils, with a photographic record with a measuring staff. Validation sampling of the placed soils, minimum three samples per soil source, shall be undertaken by the Brownfield Consultancy.

3. Standard water supply pipework can be adopted for this development. The reader is referred to Section 7.4.
4. Gas protection measures are not required. Radon protection measures are not required.
5. It is possible that hotspots of contamination may be encountered during groundworks. It is the responsibility of the Site Manager to ensure a strict watching brief is maintained. It is also the responsibility of the Site Manager to inform the Brownfield Consultancy should unexpected contamination be observed.

We would recommend that this report is submitted to the Local Planning Authority for their approval.

Prepared and approved by



JIM TWADDLE BSc (Hons) CGeol FGS
Director

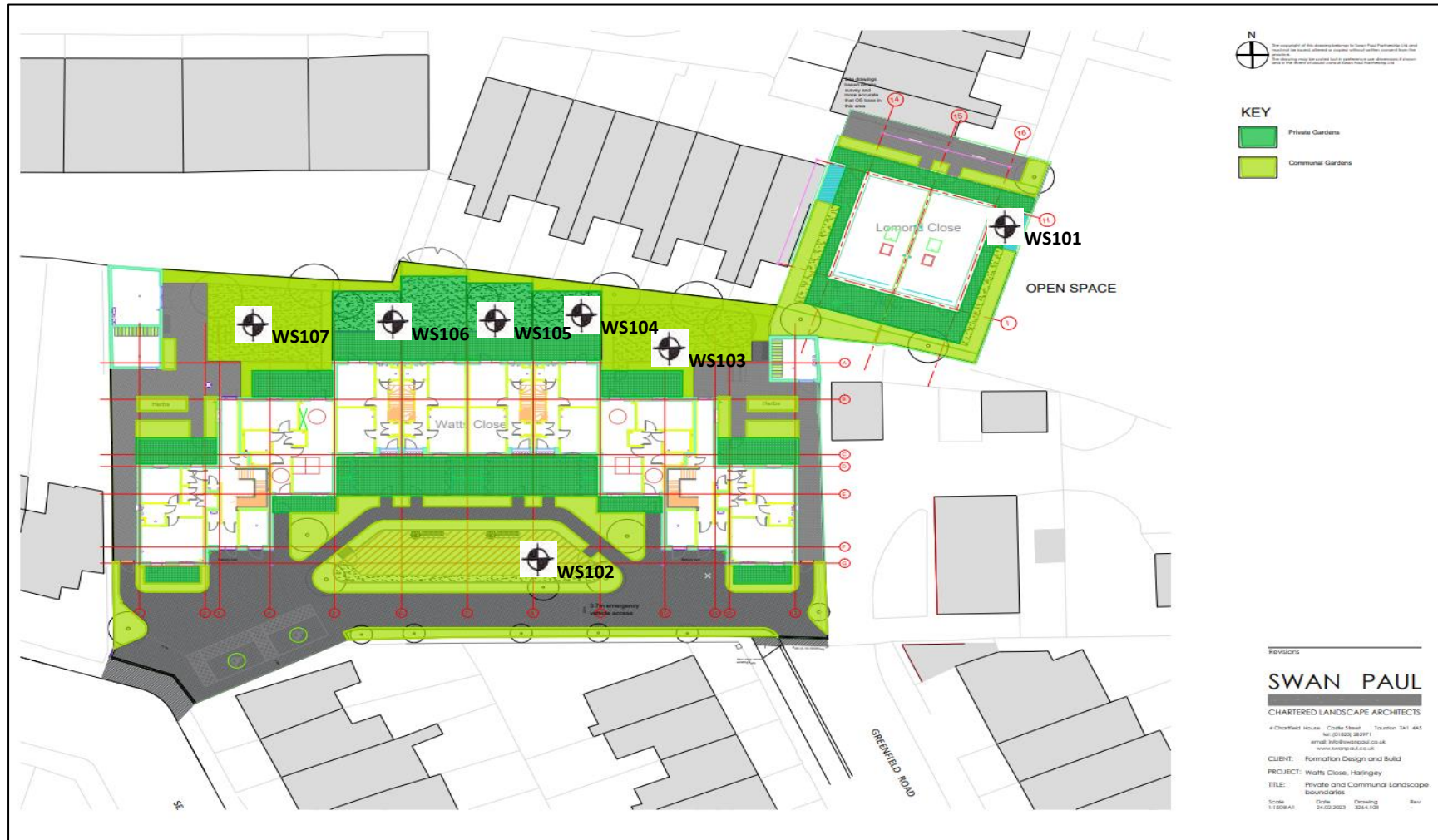
Enc:	Appendix A	Exploratory Hole Location Plan
	Appendix B	Exploratory Hole Logs
	Appendix C	Chemical Laboratory Results
	Appendix D	Gas Monitoring Results
	Appendix E	Limitations

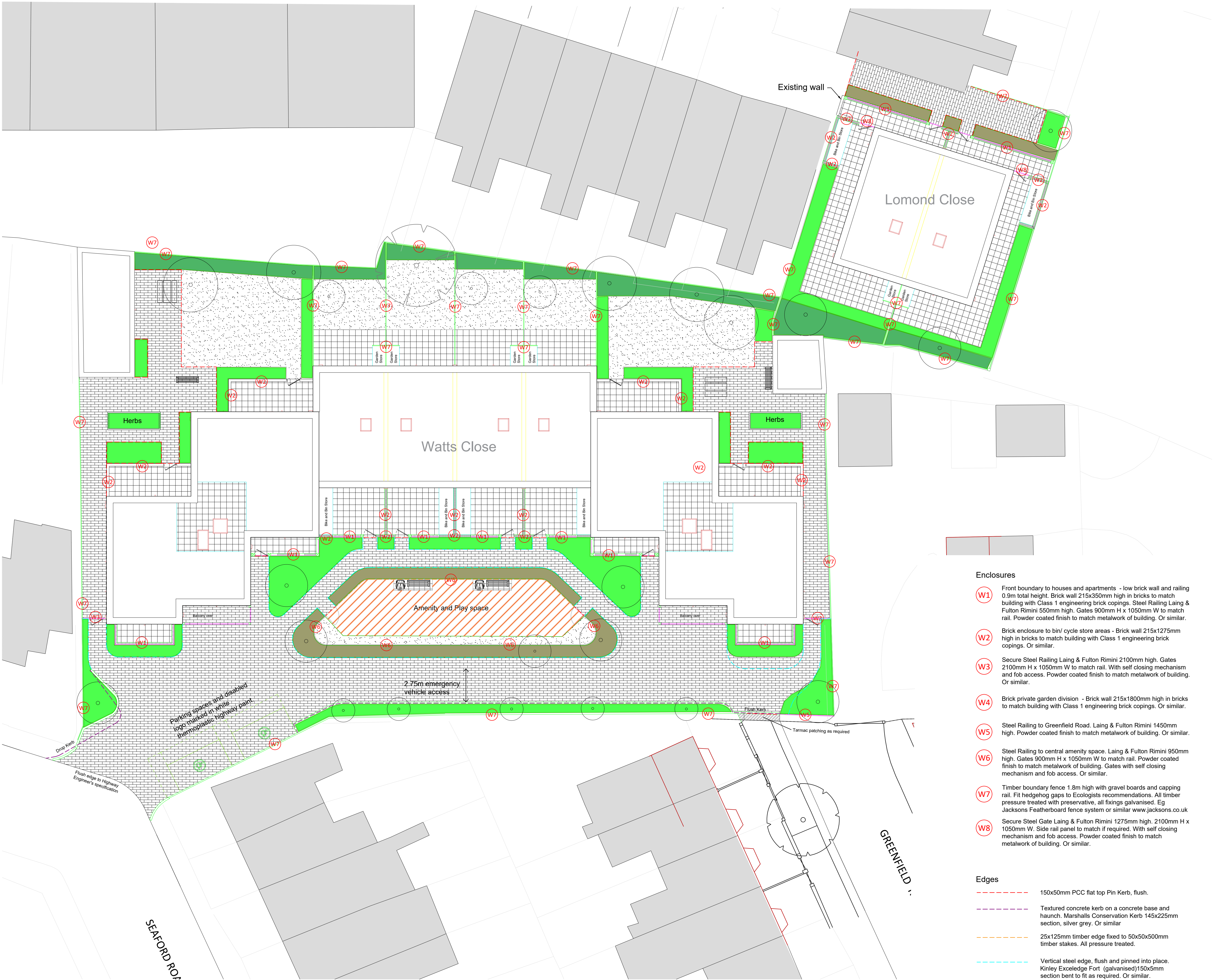
APPENDIX A

Exploratory Hole Location Plan

WATTS CLOSE, LONDON.

EXPLORATORY HOLE LOCATION PLAN



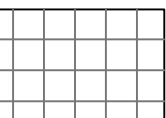


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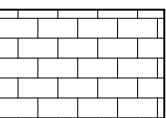
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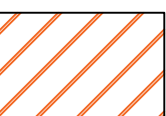
Proposed development site



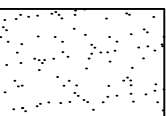
Marshall's Perfecta textured slabs, colour natural. 450 x 450 x 50mm slab paving in stack bond. Or similar



Permeable block paving in stretcher bond pattern. Marshall's Coppice Priora blocks 240x160x60mm- Cedar Blend. Or similar



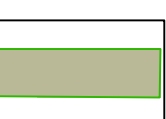
Rubber grass mat safety play surface on seeded soil or turf - Seed with EQ22 seed mix (Emorsgate Seeds). Critical fall height 1.5m min-eg 23mm mats by www.gclproducts.co.uk or similar. Fit flush to surrounding surfaces and edges. Or similar.



Mown grass from EL1 Flowering Lawn Mix (Emorsgate Seeds) or similar



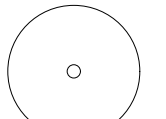
Mixed species native hedge



Low hedge (less than 2m)



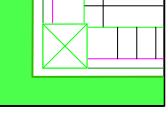
Proposed amenity planting



Proposed trees



Existing tree retained



Proposed brick pier to low wall

Notes:

- External store buildings to have concrete ground finishes as per architects drawings.
- Amenity playspace to be detailed as a separate drawing.

Enclosures

- (W1) Front boundary to houses and apartments - low brick wall and railing 0.9m total height. Brick wall 215x350mm high in bricks to match building with Class 1 engineering brick copings. Steel Railing Laing & Fulton Rimini 550mm high. Gates 900mm H x 1050mm W to match rail. Powder coated finish to match metalwork of building. Or similar.
- (W2) Brick enclosure to bin/ cycle store areas - Brick wall 215x1275mm high in bricks to match building with Class 1 engineering brick copings. Or similar.
- (W3) Secure Steel Railing Laing & Fulton Rimini 2100mm high. Gates 2100mm H x 1050mm W to match rail. With self closing mechanism and fob access. Powder coated finish to match metalwork of building. Or similar.
- (W4) Brick private garden division - Brick wall 215x1800mm high in bricks to match building with Class 1 engineering brick copings. Or similar.
- (W5) Steel Railing to Greenfield Road. Laing & Fulton Rimini 1450mm high. Powder coated finish to match metalwork of building. Or similar.
- (W6) Steel Railing to central amenity space. Laing & Fulton Rimini 950mm high. Gates 900mm H x 1050mm W to match rail. Powder coated finish to match metalwork of building. Gates with self closing mechanism and fob access. Or similar.
- (W7) Timber boundary fence 1.8m high with gravel boards and capping rail. Fit hedgehog gaps to Ecologists recommendations. All timber pressure treated with preservative, all fixings galvanised. Eg Jacksons Featherboard fence system or similar www.jacksons.co.uk
- (W8) Secure Steel Gate Laing & Fulton Rimini 1275mm high. 2100mm H x 1050mm W. Side rail panel to match if required. With self closing mechanism and fob access. Powder coated finish to match metalwork of building. Or similar.

Edges

- 150x50mm PCC flat top Pin Kerb, flush.
- Textured concrete kerb on a concrete base and haunch. Marshall's Conservation Kerb 145x225mm section, silver grey. Or similar
- 25x125mm timber edge fixed to 50x50x500mm timber stakes. All pressure treated.
- Vertical steel edge, flush and pinned into place. Kinley Exceledege Fort (galvanised)150x5mm section bent to fit as required. Or similar.

C 26.10.2022 Fire access widened
B 21.09.2022 Client comments
A 16.09.2022 Architects comments

Revisions

SWAN PAUL
PARTNERSHIP LTD
CHARTERED LANDSCAPE ARCHITECTS

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CLIENT: Formation Design and Build

PROJECT: Watts Close, Haringey

TITLE: Hard Landscape

Scale 1:150@A1 Date 15.09.2022 Drawing 3264.102 Rev C

APPENDIX B

Exploratory Hole Logs

BOREHOLE LOG

Project Watts Close, London. N15 5DW				BOREHOLE No WS101	
Job No BC643	Date 17-11-22	Ground Level (m)	Co-Ordinates ()		
Contractor The Brownfield Consultancy Ltd				Sheet 1 of 1	

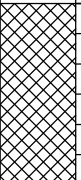
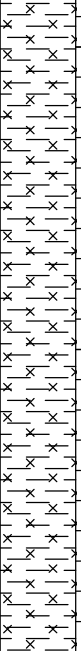
SAMPLES & TESTS			STRATA					Geology	Instrument/ Backfill
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	DESCRIPTION		
0.45	ES					(0.45)	Grey and reddish brown sandy clayey GRAVEL & COBBLE of angular to subrounded fine to coarse red brick, concrete, breeze block, paving slab and flint. Piece of string. Becoming slightly clayey towards the base of the deposit. (MADE GROUND)		
						0.45			
						(0.55)	Soft brown and grey slightly sandy gravelly, locally humic CLAY. Gravel is subangular and angular fine to coarse red and yellow brick and fragments of coal. (MADE GROUND)		
						1.00			
						(0.95)	Soft brown and grey slightly sandy slightly gravelly CLAY. Gravel is angular and subangular flint. One piece of red brick, one small piece of ceramic tile. (MADE GROUND)		
						1.95			
						(0.35)	White sandy SILT with <10mm bands of brown fine and medium SAND. (MADE GROUND)		
						2.30			
						(0.70)	Firm brown locally grey silty CLAY. (LONDON CLAY)		
						3.00			
							Borehole terminated at target depth. Groundwater not encountered.		

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
											50mm diameter standpipe installed.
All dimensions in metres Scale 1:25			Client Formation D & B			Method/ Plant Used Dynamic Sampling Rig.			Logged By JT		

BROWNFIELD DS LOG WATTS CLOSE.GPJ GINT STD AGS 3.1.GDT 12/1/23

BOREHOLE LOG

Project Watts Close, London. N15 5DW				BOREHOLE No WS102	
Job No BC643	Date 17-11-22	Ground Level (m)	Co-Ordinates ()		
Contractor The Brownfield Consultancy Ltd				Sheet 1 of 1	

SAMPLES & TESTS			STRATA					Geology	Instrument/ Backfill
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	DESCRIPTION		
0.40	ES					(0.60) 0.60	Grey and dark grey slightly sandy clayey GRAVEL & COBBLE of angular to subrounded fine to coarse concrete, flint and red brick. (MADE GROUND)		
0.60	ES					(0.20) 0.80	Soft brown and grey slightly gravelly CLAY. Gravel is angular and subangular brick and flint. (MADE GROUND)		
0.90	ES					(2.20) 3.00	Firm brown locally grey silty CLAY. (Becoming grey locally brown beyond 2.00m. (LONDON CLAY)		
							Borehole terminated at target depth. Groundwater not encountered.		

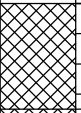
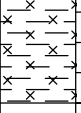
Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
											50mm diameter standpipe installed.

All dimensions in metres Scale 1:25	Client Formation D & B	Method/ Plant Used Dynamic Sampling Rig.	Logged By JT
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BROWNFIELD DS LOG WATTS CLOSE.GPJ GINT STD AGS 3.1.GDT 12/1/23

BOREHOLE LOG

Project Watts Close, London. N15 5DW				BOREHOLE No WS103	
Job No BC643	Date 17-11-22	Ground Level (m)	Co-Ordinates ()		
Contractor The Brownfield Consultancy Ltd				Sheet 1 of 1	

SAMPLES & TESTS			STRATA					Geology	Instrument/ Backfill
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	DESCRIPTION		
0.40	ES					(0.35) 0.35	Light brown sandy angular to subrounded fine to coarse GRAVEL of brick and concrete with high cobble content. Occasional fragments of metal, wood and rebar. Cobble is red brick. (MADE GROUND)		
						(0.25) 0.60	Stiff dark grey slightly sandy slightly gravelly CLAY with fine hair roots. Gravel is angular and subangular fine to coarse flint, rare yellow brick and fragments of coal. One piece of decomposed timber. (MADE GROUND)		
						(0.40) 1.00	Firm brown locally grey silty CLAY. Fine hair roots. (LONDON CLAY)		
							Borehole terminated at target depth. Groundwater not encountered.		

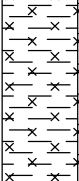
Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
											Backfilled with arisings.

All dimensions in metres Scale 1:25	Client Formation D & B	Method/ Plant Used Dynamic Sampling Rig.	Logged By JT
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BROWNFIELD DS LOG WATTS CLOSE.GPJ GINT STD AGS 3.1.GDT 12/1/23

BOREHOLE LOG

Project Watts Close, London. N15 5DW				BOREHOLE No WS104	
Job No BC643	Date 17-11-22	Ground Level (m)	Co-Ordinates ()		
Contractor The Brownfield Consultancy Ltd				Sheet 1 of 1	

SAMPLES & TESTS			STRATA					Geology	Instrument/ Backfill
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thick- ness)	DESCRIPTION		
0.35	ES					(0.30)	Light brown sandy angular to subrounded fine to coarse GRAVEL of brick and concrete with high cobble content. Occasional fragments of wood and rebar. Cobble is red brick. (MADE GROUND)		
						0.30			
						0.35	Red Bricks. (MADE GROUND)		
						(0.65)	Firm brown locally grey silty CLAY. (LONDON CLAY)		
						1.00			
							Borehole terminated at target depth. Groundwater not encountered.		

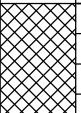
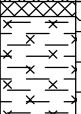
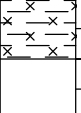
Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
											Backfilled with arisings.

All dimensions in metres Scale 1:25	Client Formation D & B	Method/ Plant Used Dynamic Sampling Rig.	Logged By JT
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BROWNFIELD DS LOG WATTS CLOSE.GPJ GINT STD AGS 3.1.GDT 12/1/23

BOREHOLE LOG

Project Watts Close, London. N15 5DW				BOREHOLE No WS105	
Job No BC643	Date 17-11-22	Ground Level (m)	Co-Ordinates ()		
Contractor The Brownfield Consultancy Ltd				Sheet 1 of 1	

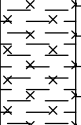
SAMPLES & TESTS			STRATA					Geology	Instrument/ Backfill
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	DESCRIPTION		
0.40	ES					(0.40)	Cobbles of subangular concrete, chalk, slate and tarmac with low coarse gravel content of breeze block. One piece of aluminium strapping. (MADE GROUND)		
						0.40 0.45 (0.55)	Stiff dark grey slightly sandy silty, locally humic CLAY with black speckling. Possibly buried Topsoil. (MADE GROUND) Firm brown locally grey silty CLAY. (LONDON CLAY)		
						1.00	Borehole terminated at target depth. Groundwater not encountered.		

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
											Backfilled with arisings.
All dimensions in metres Scale 1:25			Client Formation D & B			Method/ Plant Used Dynamic Sampling Rig.			Logged By JT		

BROWNFIELD DS LOG WATTS CLOSE.GPJ GINT STD AGS 3.1.GDT 12/1/23

BOREHOLE LOG

Project Watts Close, London. N15 5DW				BOREHOLE No WS106	
Job No BC643	Date 17-11-22	Ground Level (m)	Co-Ordinates ()		
Contractor The Brownfield Consultancy Ltd				Sheet 1 of 1	

SAMPLES & TESTS			STRATA					Geology	Instrument/ Backfill
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
0.40	ES					(0.32) 0.32	COBBLES and BOULDERS of paving slab, masonry and concrete. Old tree root. (MADE GROUND)		
						(0.20) 0.52	Stiff dark grey slightly sandy silty CLAY with black speckling. Rare fine and medium gravel of yellow brick. Small patches (<1cm) of weathered tarmac. (MADE GROUND)		
						(0.48) 1.00	Firm brown locally grey silty CLAY. (LONDON CLAY)		
							Borehole terminated at target depth. Groundwater not encountered.		

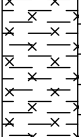
Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
											Backfilled with arisings.

All dimensions in metres Scale 1:25	Client Formation D & B	Method/ Plant Used Dynamic Sampling Rig.	Logged By JT
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BROWNFIELD DS LOG WATTS CLOSE.GPJ GINT STD AGS 3.1.GDT 12/1/23

BOREHOLE LOG

Project Watts Close, London. N15 5DW				BOREHOLE No WS107	
Job No BC643	Date 17-11-22	Ground Level (m)	Co-Ordinates ()		
Contractor The Brownfield Consultancy Ltd				Sheet 1 of 1	

SAMPLES & TESTS			STRATA					Geology	Instrument/ Backfill
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thick- ness)	DESCRIPTION		
0.35	ES					(0.35) 0.35	Light brown sandy angular to subrounded fine to coarse GRAVEL of brick and concrete with a high cobble content. Occasional fragments of wood and rebar. Cobble is red brick. (MADE GROUND)		
						0.50	Soft red brown and brown sandy gravelly CLAY. Gravel is angular red brick and rare subrounded chalk. (MADE GROUND)		
0.85	ES					(0.50) 1.00	Firm brown locally grey silty CLAY. (LONDON CLAY)		
							Borehole terminated at target depth. Groundwater not encountered.		

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
											Backfilled with arisings.
All dimensions in metres Scale 1:25			Client Formation D & B			Method/ Plant Used Dynamic Sampling Rig.			Logged By JT		

BROWNFIELD DS LOG WATTS CLOSE.GPJ GINT STD AGS 3.1.GDT 12/1/23

APPENDIX C

Chemical Laboratory Results



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Warwickshire
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e: reception@i2analytical.com

e: jim.twaddle@brownfieldconsultancy.co.uk

Analytical Report Number : 22-97761

Project / Site name:	Watts Close London	Samples received on:	18/11/2022
Your job number:	BC643	Samples instructed on/ Analysis started on:	18/11/2022
Your order number:		Analysis completed by:	08/12/2022
Report Issue Number:	1	Report issued on:	08/12/2022
Samples Analysed:	10 soil samples		

Signed:

Joanna Wawrzeczko
Reporting Specialist
For & on behalf of i2 Analytical Ltd.

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

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

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

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

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

Analytical Report Number: 22-97761
Project / Site name: Watts Close London

Lab Sample Number				2505589	2505590	2505591	2505592	2505593
Sample Reference				WS101	WS102	WS102	WS102	WS103
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.45	0.40	0.60	0.90	0.40
Date Sampled				17/11/2022	17/11/2022	17/11/2022	17/11/2022	17/11/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	67	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	19	8.3	16	18	13
Total mass of sample received	kg	0.001	NONE	0.9	0.5	0.3	0.4	0.9

Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	-	-
Asbestos Analyst ID	N/A	N/A	N/A	MJN	MJN	MJN	N/A	N/A

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	9	-	10.6	-	8.8
Water Soluble Sulphate as SO ₄ 16hr extraction (2:1)	mg/kg	2.5	MCERTS	3500	-	3500	-	1100
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	1.7	-	1.7	-	0.54
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	1730	-	1730	-	539

Speciated PAHs

Naphthalene	mg/kg	0.05	NONE	< 0.05	-	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	NONE	< 0.05	-	< 0.05	< 0.05	0.37
Acenaphthene	mg/kg	0.05	NONE	< 0.05	-	< 0.05	< 0.05	0.26
Fluorene	mg/kg	0.05	NONE	< 0.05	-	< 0.05	< 0.05	0.29
Phenanthrene	mg/kg	0.05	NONE	0.34	-	0.44	0.12	3.9
Anthracene	mg/kg	0.05	NONE	0.07	-	0.13	< 0.05	1.2
Fluoranthene	mg/kg	0.05	NONE	0.61	-	0.77	0.19	11
Pyrene	mg/kg	0.05	NONE	0.56	-	0.7	0.17	9.1
Benzo(a)anthracene	mg/kg	0.05	NONE	0.41	-	0.39	0.12	4.9
Chrysene	mg/kg	0.05	NONE	0.36	-	0.41	0.07	4.4
Benzo(b)fluoranthene	mg/kg	0.05	NONE	0.59	-	0.55	0.11	5.6
Benzo(k)fluoranthene	mg/kg	0.05	NONE	0.15	-	0.13	< 0.05	2
Benzo(a)pyrene	mg/kg	0.05	NONE	0.4	-	0.37	0.07	5
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	NONE	0.23	-	0.2	< 0.05	3.3
Dibenz(a,h)anthracene	mg/kg	0.05	NONE	< 0.05	-	< 0.05	< 0.05	0.57
Benzo(ghi)perylene	mg/kg	0.05	NONE	0.29	-	0.24	< 0.05	3.7

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	NONE	4.01	-	4.33	0.85	55.3
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Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	17	14	12	-	14
Boron (water soluble)	mg/kg	0.2	MCERTS	-	2.2	-	-	-
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	-	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	-	< 1.8	-	< 1.8
Chromium (III)	mg/kg	1	NONE	41	-	35	-	29
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	41	21	35	-	29
Copper (aqua regia extractable)	mg/kg	1	MCERTS	28	23	23	-	47
Lead (aqua regia extractable)	mg/kg	1	MCERTS	28	51	38	-	150
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	-	0.6
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	38	17	25	-	20
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	-	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	75	68	71	-	160

Analytical Report Number: 22-97761
Project / Site name: Watts Close London

Lab Sample Number				2505589	2505590	2505591	2505592	2505593
Sample Reference				WS101	WS102	WS102	WS102	WS103
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.45	0.40	0.60	0.90	0.40
Date Sampled				17/11/2022	17/11/2022	17/11/2022	17/11/2022	17/11/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					

Petroleum Hydrocarbons

TPH C10 - C40 _{EH,CU,1D,TOTAL}	mg/kg	10	NONE	< 10	-	24	-	210
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TPH5 (C6 - C10) _{HS,1D,TOTAL}	mg/kg	0.1	NONE	-	-	-	< 0.1	-
TPH5 (C10 - C20) _{EH,CU,1D,TOTAL}	mg/kg	10	NONE	-	-	-	< 10	-
TPH5 (C20 - C30) _{EH,CU,1D,TOTAL}	mg/kg	10	NONE	-	-	-	< 10	-
TPH5 (C30 - C40) _{EH,CU,1D,TOTAL}	mg/kg	10	NONE	-	-	-	< 10	-
TPH5 (C6 - C40) _{EH,CU+HS,1D,TOTAL}	mg/kg	10	NONE	-	-	-	< 10	-

U/S = Unsuitable Sample I/S = Insufficient Sample

Analytical Report Number: 22-97761
Project / Site name: Watts Close London

Lab Sample Number				2505594	2505595	2505596	2505597	2505598
Sample Reference				WS104	WS105	WS106	WS107	WS107
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.35	0.40	0.40	0.35	0.85
Date Sampled				17/11/2022	17/11/2022	17/11/2022	17/11/2022	17/11/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	16	17	13	13	17
Total mass of sample received	kg	0.001	NONE	0.4	0.3	0.9	0.4	0.3

Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	-	Not-detected	-	-
Asbestos Analyst ID	N/A	N/A	N/A	MJN	N/A	MJN	N/A	N/A

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	-	-	7.5	7.8	-
Water Soluble Sulphate as SO ₄ 16hr extraction (2:1)	mg/kg	2.5	MCERTS	-	-	2800	2600	-
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	-	-	1.4	1.3	-
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	-	-	1380	1320	-

Speciated PAHs

Naphthalene	mg/kg	0.05	NONE	< 0.05	< 0.05	0.09	0.09	0.09
Acenaphthylene	mg/kg	0.05	NONE	< 0.05	< 0.05	0.07	0.06	< 0.05
Acenaphthene	mg/kg	0.05	NONE	< 0.05	0.12	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	NONE	< 0.05	0.12	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	NONE	< 0.05	2.9	1.1	0.71	0.06
Anthracene	mg/kg	0.05	NONE	< 0.05	< 0.05	0.2	0.12	< 0.05
Fluoranthene	mg/kg	0.05	NONE	< 0.05	2.8	3	1.8	< 0.05
Pyrene	mg/kg	0.05	NONE	< 0.05	2.2	2.9	1.7	< 0.05
Benzo(a)anthracene	mg/kg	0.05	NONE	< 0.05	0.75	1.7	1.1	< 0.05
Chrysene	mg/kg	0.05	NONE	< 0.05	1.1	1.5	0.83	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	NONE	< 0.05	1.1	2	1.2	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	NONE	< 0.05	0.52	0.93	0.64	< 0.05
Benzo(a)pyrene	mg/kg	0.05	NONE	< 0.05	0.84	1.6	1.1	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	NONE	< 0.05	0.44	0.9	0.6	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	NONE	< 0.05	0.09	0.17	0.11	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	NONE	< 0.05	0.47	1	0.73	< 0.05

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	NONE	< 0.80	13.5	17.1	10.8	< 0.80
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Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	11	15	18	18	-
Boron (water soluble)	mg/kg	0.2	MCERTS	2.2	3.5	-	-	-
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	-
Chromium (hexavalent)	mg/kg	1.8	MCERTS	-	-	< 1.8	< 1.8	-
Chromium (III)	mg/kg	1	NONE	-	-	29	30	-
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	30	27	29	30	-
Copper (aqua regia extractable)	mg/kg	1	MCERTS	17	50	73	56	-
Lead (aqua regia extractable)	mg/kg	1	MCERTS	22	240	260	350	-
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	1	0.8	0.6	-
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	16	17	20	21	-
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	-
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	56	94	130	190	-

Analytical Report Number: 22-97761
Project / Site name: Watts Close London

Lab Sample Number				2505594	2505595	2505596	2505597	2505598
Sample Reference				WS104	WS105	WS106	WS107	WS107
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.35	0.40	0.40	0.35	0.85
Date Sampled				17/11/2022	17/11/2022	17/11/2022	17/11/2022	17/11/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)				Units	Limit of detection	Accreditation Status		
Petroleum Hydrocarbons								
TPH C10 - C40 _{EH,CU,1D,TOTAL}				mg/kg	10	NONE	-	-
TPH5 (C6 - C10) _{HS,1D,TOTAL}				mg/kg	0.1	NONE	-	< 0.1
TPH5 (C10 - C20) _{EH,CU,1D,TOTAL}				mg/kg	10	NONE	-	< 10
TPH5 (C20 - C30) _{EH,CU,1D,TOTAL}				mg/kg	10	NONE	-	< 10
TPH5 (C30 - C40) _{EH,CU,1D,TOTAL}				mg/kg	10	NONE	-	< 10
TPH5 (C6 - C40) _{EH,CU+HS,1D,TOTAL}				mg/kg	10	NONE	-	< 10

U/S = Unsuitable Sample I/S = Insufficient Sample

Analytical Report Number : 22-97761

Project / Site name: Watts Close London

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

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

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
2505589	WS101	None Supplied	0.45	Brown clay.
2505590	WS102	None Supplied	0.4	Brown clay and sand with gravel and stones.
2505591	WS102	None Supplied	0.6	Brown clay and sand with gravel and brick.
2505592	WS102	None Supplied	0.9	Brown clay.
2505593	WS103	None Supplied	0.4	Brown clay and loam with gravel and vegetation.
2505594	WS104	None Supplied	0.35	Brown clay and sand.
2505595	WS105	None Supplied	0.4	Brown clay and loam with vegetation.
2505596	WS106	None Supplied	0.4	Brown clay and loam with gravel and vegetation.
2505597	WS107	None Supplied	0.35	Brown clay and loam with gravel and brick.
2505598	WS107	None Supplied	0.85	Brown clay.

Analytical Report Number : 22-97761
Project / Site name: Watts Close London

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with dispersion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	NONE
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
TPHS (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method with silica gel split/clean up.	L076-PL	D	NONE
Cr (III) in soil	In-house method by calculation from total Cr and Cr VI.	In-house method by calculation	L080-PL	W	NONE
TPH Banding in Soil by FID	Determination of hexane extractable hydrocarbons in soil by GC-FID.	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	NONE
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in NaOH and addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Sulphate, water soluble, in soil	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS

For method numbers ending in 'UK or A' analysis have been carried out in our laboratory in the United Kingdom (WATFORD).

For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).

For method numbers ending in 'PL or B' analysis have been carried out in our laboratory in Poland.

Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Analytical Report Number : 22-97761
Project / Site name: Watts Close London

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
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Information in Support of Analytical Results

List of HWOL Acronyms and Operators

Acronym	Descriptions
HS	Headspace Analysis
MS	Mass spectrometry
FID	Flame Ionisation Detector
GC	Gas Chromatography
EH	Extractable Hydrocarbons (i.e. everything extracted by the solvent(s))
CU	Clean-up - e.g. by Florisil®, silica gel
1D	GC - Single coil/column gas chromatography
2D	GC-GC - Double coil/column gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics
AR	Aromatics
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - understore to separate acronyms (exception for +)
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total



4041



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Analytical Report Number : 22-98034

Project / Site name:	Watts Close, London	Samples received on:	21/11/2022
Your job number:	BC643	Samples instructed on/ Analysis started on:	22/11/2022
Your order number:		Analysis completed by:	06/12/2022
Report Issue Number:	1	Report issued on:	07/12/2022
Samples Analysed:	1 soil sample		

Signed:

Adam Fenwick
Technical Reviewer
For & on behalf of i2 Analytical Ltd.

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

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

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

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

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

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



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Analytical Report Number: 22-98034
Project / Site name: Watts Close, London

Lab Sample Number				2507263
Sample Reference				WS103
Sample Number				None Supplied
Depth (m)				0.90
Date Sampled				17/11/2022
Time Taken				None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status	
Stone Content	%	0.1	NONE	< 0.1
Moisture Content	%	0.01	NONE	18
Total mass of sample received	kg	0.001	NONE	1.5

Petroleum Hydrocarbons

TPH5 (C6 - C10) HS_1D_TOTAL	mg/kg	0.1	NONE	< 0.1
TPH5 (C10 - C20) EH_CU_1D_TOTAL	mg/kg	10	NONE	< 10
TPH5 (C20 - C30) EH_CU_1D_TOTAL	mg/kg	10	NONE	< 10
TPH5 (C30 - C40) EH_CU_1D_TOTAL	mg/kg	10	NONE	< 10
TPH5 (C6 - C40) EH_CU+HS_1D_TOTAL	mg/kg	10	NONE	< 10

U/S = Unsuitable Sample I/S = Insufficient Sample



4041



Analytical Report Number : 22-98034

Project / Site name: Watts Close, London

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

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
2507263	WS103	None Supplied	0.9	Brown clay and sand with gravel.

Analytical Report Number : 22-98034
Project / Site name: Watts Close, London

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
TPH5 (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method with silica gel split/clean up.	L076-PL	D	NONE

For method numbers ending in 'UK or A' analysis have been carried out in our laboratory in the United Kingdom (WATFORD).

For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).

For method numbers ending in 'PL or B' analysis have been carried out in our laboratory in Poland.

Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Information in Support of Analytical Results

List of HWOL Acronyms and Operators

Acronym	Descriptions
HS	Headspace Analysis
MS	Mass spectrometry
FID	Flame Ionisation Detector
GC	Gas Chromatography
EH	Extractable Hydrocarbons (i.e. everything extracted by the solvent(s))
CU	Clean-up - e.g. by Florisil®, silica gel
1D	GC - Single coil/column gas chromatography
2D	GC-GC - Double coil/column gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics
AR	Aromatics
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - understore to separate acronyms (exception for +)
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total

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Analytical Report Number : 22-98032

Project / Site name:	Watts Close, London	Samples received on:	21/11/2022
Your job number:	BC643	Samples instructed on/ Analysis started on:	22/11/2022
Your order number:		Analysis completed by:	06/12/2022
Report Issue Number:	1	Report issued on:	06/12/2022
Samples Analysed:	1 leachate sample - 1 soil sample		


Signed:

Adam Fenwick
Technical Reviewer
For & on behalf of i2 Analytical Ltd.

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

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

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

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

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

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Waste Acceptance Criteria Analytical Results								
Report No:	22-98032							
					Client: BROWNFIELD			
Location	Watts Close, London							
Lab Reference (Sample Number)	2507260 / 2507261				Landfill Waste Acceptance Criteria			
Sampling Date	17/11/2022				Inert Waste Landfill	Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill	Hazardous Waste Landfill	
Sample ID	WS103							
Depth (m)	0.90							
Solid Waste Analysis								
TOC (%)**	0.2				3%	5%	6%	
Loss on Ignition (%) **	3.0				--	--	10%	
BTEX (µg/kg)	< 10				6000	--	--	
Sum of PCBs (mg/kg)	< 0.007				1	--	--	
Mineral Oil (mg/kg) EH, ID, CU, AL	< 10				500	--	--	
Total PAH (WAC-17) (mg/kg)	1.77				100	--	--	
pH (units)**	7.4				--	>6	--	
Acid Neutralisation Capacity (mmol / kg)	1.2				--	To be evaluated	To be evaluated	
Eluate Analysis	10:1			10:1	Limit values for compliance leaching test			
	mg/l			mg/kg	using BS EN 12457-2 at L/S 10 l/kg (mg/kg)			
(BS EN 12457 - 2 preparation utilising end over end leaching procedure)								
Arsenic *	< 0.0010			< 0.0100	0.5	2	25	
Barium *	0.0024			0.0195	20	100	300	
Cadmium *	< 0.0001			< 0.0008	0.04	1	5	
Chromium *	< 0.0004			< 0.0040	0.5	10	70	
Copper *	0.0091			0.074	2	50	100	
Mercury *	< 0.0005			< 0.0050	0.01	0.2	2	
Molybdenum *	< 0.0004			< 0.0040	0.5	10	30	
Nickel *	0.0008			0.0063	0.4	10	40	
Lead *	< 0.0010			< 0.010	0.5	10	50	
Antimony *	< 0.0017			< 0.017	0.06	0.7	5	
Selenium *	< 0.0040			< 0.040	0.1	0.5	7	
Zinc *	0.013			0.11	4	50	200	
Chloride *	1.6			13	800	15000	25000	
Fluoride*	0.64			5.2	10	150	500	
Sulphate *	4.8			39	1000	20000	50000	
TDS*	25			200	4000	60000	100000	
Phenol Index (Monohydric Phenols) *	< 0.010			< 0.10	1	-	-	
DOC	14.1			115	500	800	1000	
Leach Test Information								
Stone Content (%)	< 0.1							
Sample Mass (kg)	1.5							
Dry Matter (%)	82							
Moisture (%)	18							
Results are expressed on a dry weight basis, after correction for moisture content where applicable.					* = UKAS accredited (liquid eluate analysis only)			
Stated limits are for guidance only and i2 cannot be held responsible for any discrepancies with current legislation					** – MCERTS accredited			

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes as defined by the Waste (England and Wales) Regulations 2011 (as amended) and EA Guidance WM3.
This analysis is only applicable for landfill acceptance criteria (The Environmental Permitting (England and Wales) Regulations) and does not give any indication as to whether a waste may be hazardous or non-hazardous.



Analytical Report Number : 22-98032
Project / Site name: Watts Close, London

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

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
2507260	WS103	None Supplied	0.9	Brown clay and sand with gravel.

Analytical Report Number : 22-98032
Project / Site name: Watts Close, London

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis
BS EN 12457-2 (10:1) Leachate Prep	10:1 (as recieved, moisture adjusted) end over end extraction with water for 24 hours. Eluate filtered prior to analysis.	In-house method based on BSEN12457-2.	L043-PL	W
Acid neutralisation capacity of soil	Determination of acid neutralisation capacity by addition of acid or alkali followed by electronic probe.	In-house method based on Guidance an Sampling and Testing of Wastes to Meet Landfill Waste Acceptance""	L046-PL	W
Loss on ignition of soil @ 450oC	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace.	In house method.	L047-PL	D
Mineral Oil (Soil) C10 - C40	Determination of mineral oil fraction extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L076-PL	D
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W
Speciated WAC-17 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270.	L064-PL	D
PCB's By GC-MS in soil	Determination of PCB by extraction with acetone and hexane followed by GC-MS.	In-house method based on USEPA 8082	L027-PL	D
pH at 20oC in soil	Determination of pH in soil by addition of water followed by electrometric measurement.	In house method.	L005-PL	W
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L009-PL	D
BTEX in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS. Individual components MCERTS accredited	In-house method based on USEPA8260	L073B-PL	W
Total BTEX in soil (Poland)	Determination of BTEX in soil by headspace GC-MS. Individual components MCERTS accredited	In-house method based on USEPA8260	L073-PL	W
Metals in leachate by ICP-OES	Determination of metals in leachate by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil""	L039-PL	W
Chloride 10:1 WAC	Determination of Chloride colorimetrically by discrete analyser.	In house based on MEWAM Method ISBN 0117516260.	L082-PL	W
Fluoride 10:1 WAC	Determination of fluoride in leachate by 1:1ratio with a buffer solution followed by Ion Selective Electrode.	In-house method based on Use of Total Ionic Strength Adjustment Buffer for Electrode Determination"	L033B-PL	W
Sulphate 10:1 WAC	Determination of sulphate in leachate by ICP-OES	In-house method based on MEWAM 1986 Methods for the Determination of Metals in Soil""	L039-PL	W
Total dissolved solids 10:1 WAC	Determination of total dissolved solids in water by EC probe using a factor of 0.6.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L031	W

Analytical Report Number : 22-98032
Project / Site name: Watts Close, London

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis
Monohydric phenols 10:1 WAC	Determination of phenols in leachate by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080-PL	W
Dissolved organic carbon 10:1 WAC	Determination of dissolved inorganic carbon in leachate by TOC/DOC NDIR Analyser.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037-PL	W

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Total	Aliphatics & Aromatics
AL	Aliphatics
AR	Aromatics
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
-	Operator - understore to separate acronyms (exception for +)
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total



4041



Accreditation Status
NONE
NONE
MCERTS
NONE
NONE
NONE
NONE
NONE
MCERTS
NONE
MCERTS
NONE
NONE
ISO 17025
ISO 17025
ISO 17025
ISO 17025
ISO 17025



Accreditation Status
ISO 17025
NONE

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APPENDIX D

Gas Monitoring Results

GAS MONITORING DATA

The Brownfield Consultancy

[illegible]

GAS MONITORING DATA

The Brownfield Consultancy

[illegible]

GAS MONITORING DATA

The Brownfield Consultancy

Site: Watts Close, London								Operator: J Twaddle			
Project: BC643					Date: 6.12.22			Weather: Cloudy, mild.			
Monitoring Location	Standpipe diameter (mm)	Standpipe Depth (m bgl)	Water Level (m bgl)	Atmos. Pressure (mb)	Initial Flow Rate (litres/hr)	Temp (°C)	Reading Duration (s)	CH ₄ (% v/v)	CO ₂ (% v/v)	O ₂ (% v/v)	Notes
WS101	50	3.11	Dry	1020	<0.1		30	<0.1	0.9	19.5	
							60	<0.1	0.9	19.3	
							120	<0.1	0.9	19.3	
							180	<0.1	0.9	19.3	
							240	<0.1	0.8	19.3	
							300	<0.1	0.8	19.3	
WS102	50	3.09	Dry	1020	<0.1		30	<0.1	<0.1	16.9	
							60	<0.1	<0.1	16.4	
							120	<0.1	<0.1	16.4	
							180	<0.1	<0.1	16.4	
							240	<0.1	<0.1	16.4	
							300	<0.1	<0.1	16.4	

APPENDIX D

Limitations

NOTES ON LIMITATIONS

This report has been prepared by the Brownfield Consultancy with all reasonable skill, care and diligence. This report is confidential and has been prepared solely for the benefit of the client as stated at the front of the report in relation to a specific development or scheme; and those parties with whom a warranty agreement has been executed, or with whom an assignment has been agreed.

Should any third party wish to use or rely upon the contents of the report, written approval must be sought from The Brownfield Consultancy; a charge may be levied against such approval. We accept no responsibility or liability for the consequences of this document being used for any purpose or project other than for which it was commissioned, and: this document to any third party with whom an agreement has not been executed.

Any comments given are based on the understanding that the proposed development will be as detailed. The Brownfield Consultancy warrants the accuracy of this report up to and including the published date. Additional information, improved practice or changes in legislation may necessitate this report having to be reviewed in whole or in part after that date.

This report is only valid when used in its entirety. Any information or advice included in the report should not be relied upon until considered in the context of the whole report. Whilst this report and the opinion made herein are correct to the best of our belief we cannot guarantee the accuracy or completeness of any information provided by third parties.

The opinions and recommendations expressed in this report are based on statute, guidance, and appropriate practice current at the date of its preparation. The Brownfield Consultancy does not accept any liability whatsoever for the consequences of any future legislative changes or the release of subsequent guidance documentation, etc. Such changes may render some of the opinions and advice in this report inappropriate or incorrect and we will be pleased to advise if any report requires revision due to changing circumstances. Following delivery of a report we have no obligation to advise the Client or any other party of such changes or their repercussions.

Phase 1 Reports

The work undertaken to provide the basis of a Phase I report comprised a study of available documented information from a variety of sources, together with (where appropriate) a brief walk over inspection of the site. The opinions given in this report have been dictated by the finite data on which they are based and are relevant only to the purpose for which the report was commissioned. The information reviewed should not be considered exhaustive and has been accepted in good faith as providing true and representative data pertaining to site conditions. It should be noted that any risks identified in this report are perceived risks based on the information reviewed; actual risks can only be assessed following a physical investigation of the site.

Historical maps and aerial photographs provide a “snap shot” in time about conditions or activities at the site and cannot be relied upon as indicators of any events or activities that may have taken place at other times. Any borehole data from the British Geological Survey sources are included on the following basis: “The British Geological Survey accept no responsibility for omissions or misinterpretation of the data from their Data Bank as this may be old or obtained from non-BGS sources and may not represent current interpretation”.

Phase II Intrusive Investigations

The investigation of the site has been carried out to provide sufficient information concerning the type and degree of contamination, and ground and groundwater conditions to allow a reasonable risk assessment to be made. The conclusions and recommendations made in this site appraisal report and the opinions expressed are based on the information reviewed and/or the ground conditions encountered in exploratory holes and the results of any field or laboratory testing undertaken. There may be ground conditions at the site that have not been disclosed by the information reviewed or by the investigative work undertaken. Such undisclosed conditions cannot be taken into account in any analysis and reporting.

Some of the conclusions in this site appraisal report may be based on third party data. No guarantee can be given for the accuracy or completeness of any of the third party data used.

The evaluation and conclusions do not preclude the existence of contamination, which could not reasonably have been revealed by the current work. Given the discrete nature of sampling, no investigation technique is capable of identifying all conditions present in all areas. The number of sampling points and the methods of sampling and testing do not preclude the existence of localised “hotspots” of contamination or different ground conditions where concentrations may be significantly higher than those actually encountered. Hence this report should be used for information purposes only and should not be construed as a comprehensive characterisation of all site conditions.

It should be noted that groundwater levels, groundwater chemistry, surface water levels, surface water chemistry, soil gas concentrations and soil gas flow rates can vary due to seasonal, climatic, tidal and man-made effects.

Exploratory hole locations provided in the report are generally established by tape measurement from existing features or boundaries. Hole locations are not accurately surveyed and ground levels at these locations are not obtained unless specifically requested.

The interpretation carried out in this report is based on scientific and engineering appraisal carried out by suitably experienced and qualified technical consultants based on the scope of our engagement. We have not taken into account the perceptions of, for example, banks, insurers, other funders, lay people, etc., unless the report has been prepared specifically for that purpose. Advice from other specialists may be required such as the legal, planning and architecture professions, whether specifically recommended in our report or not.

The objectives of the investigation have been linked to establishing the risks associated with potential human targets, building materials, the environment (including adjacent land), and to surface and ground water. The amount of exploratory work and chemical testing undertaken has necessarily been restricted by the short timescale available, and the locations of exploratory holes have been restricted to areas unoccupied by the building(s) on the site and by buried services.

New information, improved practices and legislation may necessitate an alteration to the report in whole, or in part, after its submission. Therefore with any change in circumstances or after the expiry of one year from the date of the report, the report should be referred to the Brownfield Consultancy Limited for re-assessment and, if necessary, re-appraisal.

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