



Client:

JC Brennan Developments Limited
74 Dickenson Road
Rusholme
Manchester
M14 5HF.

Architect/Consultant

Phase II Contaminated Land Risk Assessment

Church Avenue, Middleton

Sept 2025

Site Ref: 6192/VCA-CLRA v1.00

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Phase II Contaminated Land Risk Assessment

1. Introduction

This report is an account of a Phase I Desk Study and Preliminary Contaminated Land Risk Assessment carried out by GeoAssist Limited at the request of the Client, JC Brennan Developments Limited, for a proposed residential development with associated carparking and private gardens on Church Avenue, Middleton.

The work was commissioned following the receipt of instruction to proceed issued by the Client on the 30th June 2025.

The purpose of this Phase II investigation is to provide information following the conclusions of the Preliminary Contaminated Land Risk Assessment produced by others dated 30th June 2025, in order to ensure that the site:

- Is assessed in accordance with the UK government methodology outlined online in Land Contamination Risk Management (LCRM)
- Satisfies the relevant requirements of the Updated National Planning Policy Framework December 2024
- Is suitable for the intended proposed land use. In this case, as a residential development with private gardens.

The approximate grid reference for the centre of the site is 388570, 408810 and the total area of the site is approximately 1,600m². The area of the site scheduled for investigation is outlined with a solid red line on the site plan in Appendix A1. The positions of exploratory holes are also indicated on the plan. The proposed development plan is shown in appendix A2.

2. Description of the Site

2.1 Present

The site is located within a residential area on the southern side of Church Lane, Middleton approximately 2.5km to the northeast of Middleton town centre. The site forms a roughly rectangular parcel of land, and the levels gently falls away from Church Lane to the south. The site is comprised of a parcel of grass and scrubland with mature trees to the northeast corner, southeast and west, three small timber outbuildings (sheds) with felt roofs to the east and an area of paving at the northwest. It is understood that the site was formerly used as allotment gardens.

Residential property forms the site boundary to the west and south. Church Avenue forms the site boundary to the north over which is situated more residential property. Open land meets the eastern boundary of the site.

No particular visual or olfactory observations of contaminants were noted during the intrusive works.

2.2 Proposed

It is understood that the proposed development incorporates the erection of five detached residential dwelling houses with associated private gardens, off road parking and a shared access road.

3. Review Of Previous Reports

There is no indication that previous subsurface ground investigations have been undertaken on this site.

The issues to be covered in the present investigation are to provide information in respect of any potentially unacceptable geo-environmental risks arising from previous land uses both on site and in the immediate area, and the potential for any sources of contamination to impact both present and future receptors, including:

- Human
- Controlled waters via established pathways
- Property
- Adjoining land

4. Preliminary Conceptual Model

The original outline conceptual model can be found in the Phase I Preliminary Contaminated Land Risk Assessment produced by others.

5. Intrusive Investigation

5.1 Intrusive Investigation objectives

The objectives of the site investigation are to collect data to confirm whether or not the soils beneath the site in their current state pose a risk by reason of substances within or under the land that;

- Significant harm is being caused or there is significant possibility of such harm being caused; or
- Pollution of controlled waters is being, or is likely to be, caused.

Data to describe the following parameters has been collected at a suitable spatial resolution in accordance with BS10175, 2015:

- Soil Characteristics including type of material
- Chemical profile of the soil.
- Hydrological regime at the site
- Ground gas regime at the site

These data will be used to refine a conceptual site model and confirm the existence of any established contaminant linkage in accordance with the UK government methodology outlined online in Land Contamination Risk Management (LCRM) as well as The Environment Agency Requirements for Land Contamination Reports, 2005 where appropriate.

5.2 Intrusive Investigation Strategy

The ground investigation was carried out in accordance with British Standard 5930: 2015 Code of Practice for Site Investigations and BS BS10175: 2015 Investigation of potentially contaminated sites where relevant.

All fieldwork was supervised by suitably qualified GeoAssist Limited Environmental Engineers.

The geotechnical laboratory testing was carried out at GeoAssist's own laboratory testing facility in Stockport. The analytical testing was carried out in an independent UKAS accredited Laboratory.

5.3 Methods Used for Forming Exploratory Holes

The exploratory holes drilled across the Site as part of this investigation were established using:

- § Percussive drilling methods with casing advancement

Information provided by the Client regarding the position of proposed structures and garden areas was used to inform a decision on the actual exploratory hole locations whilst taking account of positions that could be reasonably accessed with the drilling plant selected for the task.

In general, Percussive sampling holes were used to determine the superficial soils profile for geotechnical purposes and obtain analytical samples for contamination testing. The location of services was also

considered during the positioning of the exploratory holes. A plan showing the locations of the exploratory holes established as part of the investigation forms Appendix A1 to this report.

5.4 Exploratory Hole Programme

In total 6 exploratory holes were established across the site by GeoAssist utilising the exploration techniques as outlined below:

- § Six exploratory holes WS1 to WS6 were undertaken across the Site using a dynamic percussive rig in the superficial deposits for geotechnical and analytical purposes.

The details of the strata in the exploratory holes were recorded by a suitably qualified Professional Engineer. Upon completion of boring exploratory holes WS1, WS2 and WS3 were converted into ground gas monitoring wells, incorporating a length of plain pipe with a cement/bentonite surround, connected to a length of slotted pipe with a filter sock and pea gravel surround. The headworks comprised of a lockable steel cover set in concrete flush with the surrounding ground. Exploratory Holes WS4, WS5 and WS6 were backfilled in accordance with the specification to prevent the creation of any preferential pathways.

All intrusive work was carried out in accordance with:

- § British Standard 5930: 2015 Code of Practice for Site Investigations
- § British Standard 10175: 2011 where applicable

The fieldwork for all exploratory holes was completed on 07th July 2025 in dry weather conditions. The location of the exploratory holes are shown on the site plan in Appendix A1.

5.5 Field Sampling and Testing

For the Boreholes, a non-targeted layout was selected as the most appropriate strategy for this site. Representative samples were taken of all the strata encountered in the exploratory holes. Once exposed samples to be subjected to chemical analysis were immediately placed into a suitable container and stored in a cool dark sample box prior to submission to the laboratory in order to prevent alteration of the composition of the samples. In all cases 500ml wide necked amber glass jars were used with a Teflon faced foamed polyethylene cap liner that offers excellent chemical resistance with the compressibility and sealing properties of polyethylene foam. These containers were filled with sample, sealed and delivered to the laboratory for testing. Samples for volatile compounds were placed into appropriate containers with a screw cap and pierceable septum as supplied by the testing laboratory specifically appropriate to the determinand. These containers were filled with sample sealed and delivered to the laboratory for testing.

All other samples were stored in airtight containers and returned to the laboratory for examination and geotechnical testing where necessary.

A photo ionisation detector (PID) with a 10.6eV lamp was used as a screening tool to indicate the likelihood of the presence of volatile organic compounds throughout the profile of the shallow soils in the laboratory. The PID results are all given as isobutylene equivalents and are included within the Exploratory Hole Logs only where elevated readings were noted (5ppm). None were recorded.

6. Laboratory Investigation

6.1 Contamination Testing

In total 6 soil samples were collected and subjected to elements of the suite of chemical testing as outlined below. All tests were conducted by i2 Analytical under UKAS Testing No 4041. The results of all the chemical analysis tests are given in appendix C1.

Soils	
Arsenic	Acenaphthene
Boron (water-soluble)	Acenaphthylene
Cadmium	Anthracene
Chromium	Benzo(a)Anthracene
Chromium VI	Benzo(a)Pyrene
Copper	Benzo(b/k)Fluoranthene
Cyanide(Total)	Benzo(ghi)Perylene
Cyanide(free)	Chrysene
Lead	Dibenzo(ah)Anthracene
Mercury	Fluoranthene
Nickel	Fluorene
pH	Indeno(123-cd)Pyrene
Phenols(Mono)	Naphthalene
Selenium	Phenanthrene
SO4(Total)	Pyrene
Sulphide	BTEX & MTBE (where PID Screening indicates a requirement)
Sulphur(Free)	Speciated TPH (where PID Screening indicates a requirement)
Thiocyanate	VOCs (where PID Screening indicates a requirement)
Zinc	Asbestos ID (screen)

7. Subsurface Stratigraphy

The subsoil profile obtained from the exploratory holes WS1 to WS6 indicates the presence of variable grass/inferior vegetation over topsoil overlying gravelly sandy silty clay with sand and silt inclusions and partings. The clay at depth generally varies from firm to stiff becoming very stiff with depth.

Exploratory hole WS1 penetrated very stiff desiccated clays with evidence of fine rootlets present to 2.80m indicating the impact of the trees present in this area.

WS2 penetrated very soft organic silty clay to 2.00m interbedded with sand and very soft to firm clay beneath and present to 4.00m.

WS3 penetrated soft to firm clay to 3.00m depth with sand inclusions.

All of the exploratory holes were terminated in stiff to very stiff gravelly sandy silty clay present typically from around 3.00m to 4.00m depth.

Further details of the subsurface stratigraphy can be found in the exploratory hole log sheets which form Appendix B1 to this report.

Table 7.0 Subsoil Profile Summary

Strata	Depth of Strata (m) below ground level	
	Top	Base
Variable inferior grass/TOPSOIL	Ground Level	0.20
Very soft silty Clay with silt inclusions and sand horizons (organics present in WS2)	0.20	3.20 to 4.00 In WS2 and WS3
Firm to stiff to very stiff gravelly sandy silty Clay	3.20 to 4.00	Not proven

8. Groundwater

Seepage groundwater was recorded in exploratory holes WS2 and WS3 at 2.00m depth during the course of the fieldwork. The groundwater conditions entered on the exploratory hole logs are those observed at the time of the investigation and the water level may not have reached equilibrium with the surrounding water level prior to the record being taken. The groundwater monitoring undertaken in the standpipes installed in WS1 to WS3 recorded highest groundwater depths varying from dry in WS1, to 0.60m and 1.45m in WS2 and WS3 respectively.

Groundwater levels will be subject to seasonal variation or changes in local drainage conditions and could be higher at certain times of the year particularly after periods of heavy rainfall.

9. Ground Gas

Made Ground has not been encountered at this site and the absence of any other anthropogenic gas sources identified from historical mapping indicates a low probability for the presence of ground gas at the site. A series of gas monitoring pipes were installed to confirm that the presence of organic clay noted in WS2 do not present a gas risk to the proposed development. Gas readings demonstrate that the naturally occurring

organic clay deposits as noted in WS2 are not producing methane and carbon dioxide levels are below 3% v/v. Consequently, it is not believed to present a significant gas risk to the site. The site has been categorised as Very Low Risk (NHBC Green and C665 CS1) for ground gas and no further action is required.

10. Part IIA Legislation

Part IIA of the Environmental Protection Act 1990 (inserted by Section 57 of the Environment Act 1995) provides a new regime for the control of specific threats to health or the environment from existing land contamination. In accordance with the Act and the statutory guidance document on The Contaminated Land (England) Regulations 2000, the definition of contaminated land is intended to embody the concept of risk assessment. Within the meaning of the Act, land is only “contaminated land” where it appears to the regulatory authority, by reason of substances within or under the land that

- § Significant harm is being caused or there is significant possibility of such harm being caused; or
- § Pollution of controlled waters is being, or is likely to be, caused.

The guidance defines “risk” as the combination of

- § The probability, or frequency, of occurrence of a defined hazard (for example, exposure of a property to a substance with the potential to cause harm); and
- § The magnitude (including the seriousness) of the consequences.

For a risk of pollution or environmental harm to occur as a result of ground contamination, all of the following elements must be present:

- § A source, i.e. a substance that is capable of causing pollution or harm;
- § A receptor (or target). i.e. something which could be adversely affected by the contaminant; and
- § A pathway, i.e. a route by which the contaminant can reach the receptor.

If one of these elements is missing there can be no significant risk. If all are present then the magnitude of the risk is a function of the magnitude and mobility of the source, the sensitivity of the receptor and the nature of the migration pathway.

10.1 Assessment Methodology

In order to assess the environmental risk posed by potential contaminants within the near surface soils considering the final levels of the scheme, GeoAssist Limited undertook an initial screen of the laboratory results using GeoAssist Limited Generic Assessment Criteria (GACs) and where applicable Category 4 Screening Levels as given as part of Appendix C2.

The GeoAssist Limited GACs and Category 4 Screening levels (C4SLs herein) are generated in consideration of the proposed end use of the Site, in this case as residential land with gardens. Contaminant concentrations below the GACs and or C4SLs levels are considered not to warrant further risk assessment. Concentrations of potential contaminants above the GACs and C4SLs levels require further consideration of the potential pollutant linkages. It should be noted that exceedance of the GACs and or C4SLs levels does

not necessarily mean that the Site requires remediation, although this is dependent on the nature, type and depth of the contaminant and further justification may be required.

10.2 Soils

For assessment of the soil analysis results with regard to potential human health risks, GeoAssist Limited GACs are selected from the following sources which represent minimal risk to site users:

CLEA Soil Guideline Values (SGVs). These values have been developed by the Department of the Environment, Food and Rural Affairs (DEFRA) and the Environment Agency (EA) using the Contaminated Land Exposure Assessment (CLEA) Model, and are considered to be protective of human health (considered to be a potential receptor on site). To date, SGVs have been published for only a limited suite of contaminants, with SGVs derived for each contaminant for three different land use scenarios namely:

- § residential
- § allotments
- § commercial and industrial.

The proposed assessment of this site is as residential land with gardens as this is considered to be the most appropriate land use scenario for the proposed situation on site.

Chartered Institute of Environmental Health Generic Assessment Criteria (LQM CIEH GAC) have been used where available and where CLEA SGVs have not yet been published.

Where CLEA or LQIM CIEH GAC values are not available, Atkins at Risk GAC values have been selected as appropriate all of which represent a minimal risk to receptors.

C4SLs and where appropriate the surrogate marker approach for PAH compounds have been used in preference to LQM S4UL and these represent a Low Level of Toxicological Concern (LLTC herein). LLTC represent an intake of low concern that remains suitably protective of health, and definitely does not approach an intake level that could be defined as Significant Possibility of Significant Harm.

The CLEA guidelines state that for each contaminant, apart from lead, the upper 95th percentile of the mean measured concentration should be calculated where appropriate and this value should be compared to the applicable screening value (defined here as the GeoAssist Limited GACs).

For Lead impacts the geometric mean should be calculated and compared to the GAC or C4SL.

The CLEA model states that, 'the contamination is assumed to be at or within 1 m of the surface (CLR10 page 10 now withdrawn). It is considered that at depths greater than 1m, the probability of human exposure via the direct contact pathways are significantly reduced, leaving inhalation of volatile compounds as the dominant pathway. Typically, volatile compounds only significantly affect the indoor inhalation pathway.

10.3 Subsoil Deposits

The soils contaminants that were identified above the GeoAssist Limited GACs, SGVs and C4SLs for a residential with gardens end use from the GeoAssist Limited investigations are summarized below.

Table 10.3 Tier one summary of identified soils impacts.

Determinand	GAC (mg/kg) Residential	Total No. of tests / No. of tests in impacted strata	No. of samples exceeding SGV/GAC/ C4SL	Max Value (mg/kg)	Treat as Hotspot	US95 Value	Further action required
Heavy Metals and Metalloids							
Lead	200	6/1	1	430	Yes	Not Applicable	Remove impacted soils and retest adjacent areas
PAH Compounds							
None identified							

SM **Surrogate marker approach**

The analytical laboratory test results and analysis are presented in appendix C1 & C2 and have identified potential risks to end users of the Site from a single elevated level of anthropogenic contamination (lead) within the near surface soils at the location of WS4 on the Site. Results confirm that further action is likely to be required in the form of removal and replacement of the affected soils to a depth of 600mm or the natural clay strata across affected areas. This approach would normally suffice to mitigate risks to an acceptable level without generating excessive and unnecessary site wide remediation costs for the developer.

Asbestos fibres were not detected in any of the samples submitted for identification tests and the natural makeup of the ground at the site indicates it is unlikely that asbestos or asbestos containing materials will be encountered at this site.

The results of all the chemical laboratory analytical tests form appendix C1 to this report and the analysis of the results forms appendix C2 to this report.

11. Discussion

The assessment of the chemical laboratory analytical tests has identified that the soils on this site pose a moderate risk to end users from Contaminants of Concern when assessed in accordance with the current UK methodology. Consequently, the risk to end user receptors from ground contamination is classified as moderate given a residential end use scenario.

Construction Workers

The risk to construction workers and site users during the construction phase is assessed to be low provided that good working practice is maintained. Standard PPE & RPE precautions should be adopted at the site strip stage including the use of disposable coveralls, particulate masks and damping down to suppress airborne dust where conditions dictate.

Site Users

The risk to site users of the completed development is moderate in all reasonably foreseeable circumstances.

Building Service Pipes

The risk to building services from chemical attack is likely to be low given the status of the site. The route of service pipes should be assessed when information for proposed connections becomes available.

12. Remediation

Given the soils on site present a moderate risk to site end user receptors and a low risk to the wider environment, the production of a limited scope remediation scheme is likely to be a requirement on this site along with associated validation sampling of any imported soils (this may not be necessary). It is the duty of the developer to maintain adequate lines of evidence that any imported soils are suitable and failure to provide the necessary evidential information such as waste transfer notes, photographs, delivery notes for imported soils could lead to planning delays and cost increases in the final completion stages of the development for which the developer will be responsible.

13. Conceptual Model

The updated conceptual model based on the information and test results presented in this report including contamination sources, pathways and receptors is presented below.

Table 13 Amended Conceptual Site Model based on information as presented within this report.

Potential Source /Hazard	Nature of Hazard (Risk Level to site given a Residential end use	Contaminants Associated with Source	Potential Pathway	Potential Receptor
Previous & Present ON SITE Land uses:				
1. Allotment Gardens	Ground contamination Low to Moderate Risk	Lead in WS4 only	Dermal Contact Ingestion Inhalation	Site End Users Construction workers Controlled Waters
	Gas from in-filled ground / natural organic deposits Low Risk NHBC Green & Ciria C665 CS1	Carbon Dioxide <3% Methane = Nil	Vertical and Lateral Migration	Site Users Future Buildings & Services
Previous OFF SITE land uses within 250m as indicated by Historical Plans Including:				
3. Coal Workings & Brine Extraction	Geotechnical Hazard	None	Ground Collapse Subsidence	Humans (site users) Future Buildings & Services
	Ground contamination Low Risk	None	None	Site Users Services
	Mine Gas Low Risk	None	None	Humans (site users) Future Buildings

Only sources that have not been present on site in the past or currently are considered within the off site category. Unless the information is deemed to be pertinent to the analysis.

14. Conclusions

Evidence presented elsewhere within this report indicates that there is:

- A **Low to Moderate Risk** to end user receptors from soil contamination at the site in its present condition
- The site presents a **Low Risk** to controlled waters and the wider environment in its present condition
- The proposed development presents a **Moderate Risk** to end user receptors from soil contamination.
- The proposed development presents a **Low Risk** to controlled waters and the wider environment.

The site presents an overall **Moderate Risk** to end user receptors in its present state and will only be regarded as fit for purpose from a ground contamination perspective following the implementation of a limited scope remedial action plan.

A Limited Scope Remediation Plan will need to be prepared, submitted to, and approved by the LPA prior to onsite development works being undertaken.

14.1 Supplementary Recommendations

Careful observations should be made during site preparation and foundation works to confirm the current assessment of site conditions. Any evidence of contamination not previously identified should be brought to the attention of the LPA as soon as is practicably possible.



Matthew Benson MSc. GMICE
Geotechnical/Environmental Engineer



Mark Richardson MSc CEng MICE
Technical Director

Field investigations have been restricted to a level of detail required to achieve the stated objectives of the work. Ground conditions are, and can be, variable and have only been tested at isolated locations across the site. Therefore, the potential exists for ground conditions to be encountered which are different to those considered in this report. Chemical analysis was conducted for a number of parameters based on an expert understanding of the historical and operational data available at the time and it should not be inferred or otherwise, that other chemical species are not present.

This report has been prepared by GeoAssist Limited with all reasonable professional skill and care within the terms of the contract with JC Brennan Developments Limited. The report is confidential to JC Brennan Developments Limited, their/the named persons, advisors and bankers, and GeoAssist Limited accepts no responsibility of whatever nature to third parties to whom this report may be divulged. GeoAssist Limited owns the copyright in this report. All rights are reserved and unauthorised use is prohibited. JC Brennan Developments Limited may use the report for their/her/his own purposes.

Appendix A

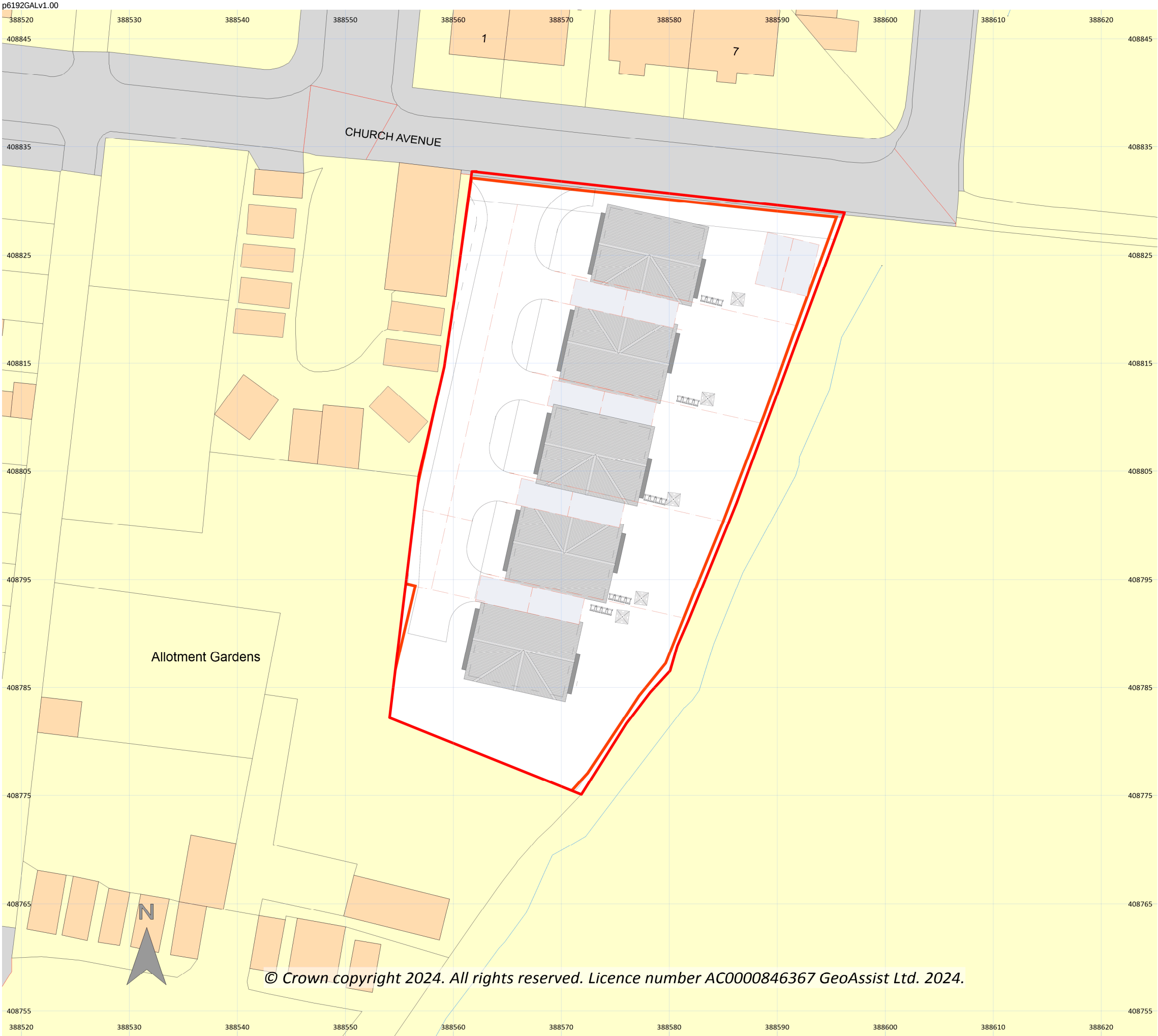
- A1 Site Plan & Exploratory Hole Locations**
- A2 Proposed Site Plan**



A1 Site Plan

Site Name	Church Avenue
Location	Middleton
GeoAssist Ref	6192VCA
Client	JC Brennan Developments Limited
	74 Dickenson Road Rusholme Manchester M14 5HF.
Planning Consultant	
NGR (centre of site)	388570,408810
Production Date	September 2025
Survey Method	
Surveyor	Others
Status	Final v1.00
Base Survey	OSGB36

Do Not Scale



A2 Proposed Plan

Site Name	Church Avenue
Location	Middleton
GeoAssist Ref	6192VCA
Client	JC Brennan Developments Limited
	74 Dickenson Road Rusholme Manchester M14 5HF.
Planning Consultant	
NGR (centre of site)	388570,408810
Production Date	September 2025
Survey Method	
Surveyor	Others
Status	Final v1.00
Base Survey	OSGB36

Do Not Scale

Appendix B

- B1 Exploratory Hole Logs**
- B2 Ground Gas Readings & Risk Assessment**
- B3 Gas Monitoring Calibration Certification**

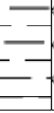
GeoAssist Limited		Exploratory Hole Record Sheet				Ref: WS1	
Consultant: 0		Project: Church Avenue Location: Middleton				Sheet: 1	
Client: JC Brennan Developments Limited		Equipment: Archway Dart Rig with DCP Probe				Ground Level: 134.71 m.AOD Co-ordinates: Easting: 388590(m) Northing: 408825.2(m) Dates: 07/07/2025 to 07/07/2025	
Drilling Foreman: M Walton STRATUM DESCRIPTION Engineer/Geologist: M Benson		Depth (Thick) (m)	Reduced Level (mAOD)	Strata Legend/ Standpipe Backfill	Samples/Tests		Field Records
					Depth (m) from to	Sample Type/No	Blow Count N/(U)
0 Grass over brown sandy TOPSOIL with roots		0.20	134.51				
Stiff to very stiff orange/brown with light grey gravelly sandy silty CLAY with silt inclusions - desiccated		(0.90)			0.30 0.40 0.40 0.50 0.70 0.80	C1 D1 D2	
1 Very stiff brown gravelly sandy silty CLAY with occasional sand inclusions and fine rootlets to 2.80m depth		1.10	133.61		1.00	CP1	16
2		(1.80)			2.00	CP2	11
3 Stiff brown slightly gravelly sandy silty CLAY		2.90	131.81		2.50 2.60	D3	
Firm to stiff brown slightly gravelly sandy silty CLAY		(0.70)			3.00	CP3	10
4		3.60	131.11		3.50 3.60	D4	
5 Dynamic Probe only from 5.00m depth		(1.90)			4.00	CP4	5
Stiff to vey stiff slightly gravelly sandy silty CLAY - Interpreted Stratum		5.50	129.21		4.50 4.60	D5	
6		(2.50)			5.00	CP5	6
7		8.00	126.71		6.00	CP6	18
8 Exploratory Hole complete at 8.00m					7.00	CP7	40
9					7.90	CP8	42
10							
Remarks:						Logged: M Benson Date: 08/07/2025 Checked: M Richardson Date: 10/09/2025 Site Ref: 6192/VCA Scale 1:50 approx	
The groundwater conditions entered on the exploratory hole logs are those observed at the time of the drilling operations and the water level may not have reached equilibrium with the surrounding water level prior to the record being taken. Standing groundwater levels will be subject to seasonal variation or changes in local drainage conditions and could be higher at certain times of the year particularly after periods of heavy rainfall.							

GeoAssist Limited		Exploratory Hole Record Sheet				Ref: WS2	
Consultant: 0		Project: Church Avenue Location: Middleton				Sheet: 1	
Client: JC Brennan Developments Limited		Equipment: Archway Dart Rig with DCP Probe				Ground Level: 131.91 m.AOD Co-ordinates: Easting: 388572.5(m) Northing: 408786.9(m) Dates: 07/07/2025 to 07/07/2025	
Drilling Foreman: M Walton STRATUM DESCRIPTION Engineer/Geologist: M Benson		Depth (Thick) (m)	Reduced Level (mAOD)	Strata Legend/ Standpipe Backfill	Samples/Tests Depth (m) from to		Field Records
					Sample Type/No	Blow Count N/(U)	
0 Vegetation over soft brown very silty CLAY with roots		0.20	131.71		0.30 0.40 0.40 0.50	C1 D1	
1 Very soft to soft brown/grey organic silty CLAY with sand inclusions		(1.80)			1.00 1.50 1.50 1.60	CP1 D2	0 Hand vane at 1.50m - 19kPa
2 Grey/brown SILT/CLAY		2.00	129.91		2.00 2.50 2.50 2.60	CP2 D3	0 Wet at 2.00m depth
3 Brown silty fine to medium SAND with silty clay inclusions		2.30	129.61		3.00 3.70 3.70 3.80	CP3 D4	0 Hand vane at 3.30m - 17kPa Hand vane at 3.70m - 34kPa
4 Very soft to firm brown slightly gravelly very silty CLAY		(1.00)	127.91		4.00 4.50 4.50 4.80 4.80 4.90 4.90 5.00	CP4 CP5 D5 CP6	9 15 14 Hand vane at 4.80m - 71kPa
5 Firm to stiff brown slightly gravelly very silty CLAY with silty sand inclusions		(1.50)			5.40 5.50 5.90 6.00 6.00 6.00	D6 D7 CP7	Hand penetrometer at 5.50m - 134kPa
6 Stiff to very stiff brown gravelly sandy to very sandy silty CLAY		(0.50)	125.91				
7 Dynamic Probe only from 6.00m depth		6.00					
8 Stiff to very stiff gravelly sandy silty CLAY - Interpreted Stratum		(2.00)			7.00 7.90	CP8 CP9	39 60
9 Exploratory Hole complete at 8.00m		8.00	123.91				07/07/2025: On completion of exploratory hole at 8.00m. Casing at 4.00m. Standing water level Nil with casing. On withdrawal of casing groundwater monitoring standpipe installed to 5.00m with response zone from 1.00m to 5.00m
10							
Remarks:						Logged: M Benson Date: 08/07/2025 Checked: M Richardson Date: 10/09/2025 Site Ref: 6192/VCA Scale 1:50 approx	
The groundwater conditions entered on the exploratory hole logs are those observed at the time of the drilling operations and the water level may not have reached equilibrium with the surrounding water level prior to the record being taken. Standing groundwater levels will be subject to seasonal variation or changes in local drainage conditions and could be higher at certain times of the year particularly after periods of heavy rainfall.							

GeoAssist Limited		Exploratory Hole Record Sheet				Ref: WS3	
Consultant: 0		Project: Church Avenue Location: Middleton				Sheet: 1	
Client: JC Brennan Developments Limited		Equipment: Archway Dart Rig with DCP Probe				Ground Level: 132.74 m.AOD Co-ordinates: Easting: 388558.5(m) Northing: 408806.2(m) Dates: 07/07/2025 to 07/07/2025	
Drilling Foreman: M Walton STRATUM DESCRIPTION Engineer/Geologist: M Benson		Depth (Thick) (m)	Reduced Level (mAOD)	Strata Legend/ Standpipe Backfill	Samples/Tests Depth (m) from to		Field Records
					Sample Type/No	Blow Count N/(U)	
0 Vegetation over dark grey clayey TOPSOIL		0.20	132.54				
Orange/brown with light brown and grey very sandy silty CLAY with sand inclusions		(0.80)			0.30 0.40 0.40 0.50	C1 D1	
1 Firm brown/grey silty CLAY with brown sand inclusions		1.00	131.74		1.00 1.20 1.20 1.30	CP1 D2	5 Hand vane at 1.20m - 42kPa
2 Soft to firm brown slightly gravelly very silty CLAY		2.00	130.74		2.00 2.50 2.50 2.60	CP2 D3	5 Wet at 2.00m depth Hand vane at 2.50m - 47kPa
3 Loose brown silty fine to medium SAND		3.00	129.74		3.00 3.10 3.00 3.00	D4 CP3	8
Stiff brown gravelly sandy silty CLAY		3.20	129.54		3.50 3.60 4.00 4.50 4.50 4.60	D5 CP4 D6	11 Hand penetrometer at 3.50m - 130kPa Hand penetrometer at 4.50m - 107kPa
4 Dynamic Probe only from 5.00m depth		5.00	127.74		5.00 5.00	CP5	16
Stiff gravelly sandy silty CLAY - Interpreted Stratum					6.00 7.00 7.00 7.90	CP6 CP7 CP8	17 23 39
5 Exploratory Hole complete at 8.00m		8.00	124.74				
6							
7							
8							
9							
10							

Remarks:		Logged: M Benson Date: 08/07/2025 Checked: M Richardson Date: 10/09/2025 Site Ref: 6192/VCA Scale 1:50 approx
The groundwater conditions entered on the exploratory hole logs are those observed at the time of the drilling operations and the water level may not have reached equilibrium with the surrounding water level prior to the record being taken. Standing groundwater levels will be subject to seasonal variation or changes in local drainage conditions and could be higher at certain times of the year particularly after periods of heavy rainfall.		

GeoAssist Limited		Exploratory Hole Record Sheet					Ref: WS4	
Consultant: 0		Project: Church Avenue Location: Middleton					Sheet: 1	
Client: JC Brennan Developments Limited		Equipment: Archway Dart Rig with DCP Probe					Ground Level: 132.94 m.AOD Co-ordinates: Easting: 388581.6(m) Northing: 408804.2(m) Dates: 07/07/2025 to 07/07/2025	
Drilling Foreman: M Walton STRATUM DESCRIPTION Engineer/Geologist: M Benson		Depth (Thick) (m)	Reduced Level (mAOD)	Strata Legend/ Standpipe Backfill	Samples/Tests			Field Records
					Depth (m) from to	Sample Type/No	Blow Count N/(U)	
0 Grass over brown clayey TOPSOIL with roots		0.20	132.74					Hand penetrometer at 0.50m - 85kPa 07/07/2025: On completion of exploratory hole at 1.00m. Standing water level Nil. Exploratory hole backfilled and reinstated.
Dark brown sandy silty CLAY with fine rootlets		0.40	132.54		0.30 0.40	C1		
Stiff orange/brown and grey slightly gravelly sandy silty CLAY		(0.60)			0.50 0.60	D1		
1 Exploratory Hole complete at 1.00m		1.00	131.94					
2								
3								
4								
5								
6								
7								
8								
9								
10								
Remarks: The groundwater conditions entered on the exploratory hole logs are those observed at the time of the drilling operations and the water level may not have reached equilibrium with the surrounding water level prior to the record being taken. Standing groundwater levels will be subject to seasonal variation or changes in local drainage conditions and could be higher at certain times of the year particularly after periods of heavy rainfall.							Logged: M Benson Date: 08/07/2025 Checked: M Richardson Date: 10/09/2025 Site Ref: 6192/VCA Scale 1:50 approx	

GeoAssist Limited		Exploratory Hole Record Sheet					Ref: WS5	
Consultant: 0		Project: Church Avenue Location: Middleton					Sheet: 1	
Client: JC Brennan Developments Limited		Equipment: Archway Dart Rig with DCP Probe					Ground Level: 132.03 m.AOD Co-ordinates: Easting: 388558.73(m) Northing: 408791.9(m) Dates: 07/07/2025 to 07/07/2025	
Drilling Foreman: M Walton STRATUM DESCRIPTION Engineer/Geologist: M Benson		Depth (Thick) (m)	Reduced Level (mAOD)	Strata Legend/ Standpipe Backfill	Samples/Tests			Field Records
					Depth (m) from to	Sample Type/No	Blow Count N/(U)	
0 Vegetation over dark grey clayey sand and gravel - MADE GROUND Grey/brown organic silty CLAY		0.10 (0.80)	131.93		0.30 0.40 0.50 0.60	C1 D1		07/07/2025: On completion of exploratory hole at 1.00m. Standing water level Nil. Exploratory hole backfilled and reinstated.
1 Grey/brown gravelly sandy silty CLAY		0.90 1.00	131.13 131.03					
Exploratory Hole complete at 1.00m								
2								
3								
4								
5								
6								
7								
8								
9								
10								
Remarks: The groundwater conditions entered on the exploratory hole logs are those observed at the time of the drilling operations and the water level may not have reached equilibrium with the surrounding water level prior to the record being taken. Standing groundwater levels will be subject to seasonal variation or changes in local drainage conditions and could be higher at certain times of the year particularly after periods of heavy rainfall.							Logged: M Benson Date: 08/07/2025 Checked: M Richardson Date: 10/09/2025 Site Ref: 6192/VCA Scale 1:50 approx	

GeoAssist Limited		Exploratory Hole Record Sheet					Ref: WS6	
Consultant: 0		Project: Church Avenue Location: Middleton					Sheet: 1	
Client: JC Brennan Developments Limited		Equipment: Archway Dart Rig with DCP Probe					Ground Level: 133.7 m.AOD Co-ordinates: Easting: 388563.5(m) Northing: 408829.5(m) Dates: 07/07/2025 to 07/07/2025	
Drilling Foreman: M Walton STRATUM DESCRIPTION Engineer/Geologist: M Benson		Depth (Thick) (m)	Reduced Level (mAOD)	Strata Legend/ Standpipe Backfill	Samples/Tests			Field Records
					Depth (m) from to	Sample Type/No	Blow Count N/(U)	
0 Grass over orange/brown and grey brick rubble - MADE GROUND		0.20	133.50					Hand penetrometer at 0.80m - >250kPa 07/07/2025: On completion of exploratory hole at 1.00m. Standing water level Nil. Exploratory hole backfilled and reinstated.
Grey silty sand with gravel - MADE GROUND		0.40	133.30			0.30 0.40	C1	
Very stiff orange/brown with light grey gravelly very sandy silty CLAY		(0.60)				0.80 0.90	D1	
1 Exploratory Hole complete at 1.00m		1.00	132.70					
2								
3								
4								
5								
6								
7								
8								
9								
10								
Remarks: The groundwater conditions entered on the exploratory hole logs are those observed at the time of the drilling operations and the water level may not have reached equilibrium with the surrounding water level prior to the record being taken. Standing groundwater levels will be subject to seasonal variation or changes in local drainage conditions and could be higher at certain times of the year particularly after periods of heavy rainfall.							Logged: M Benson Date: 08/07/2025 Checked: M Richardson Date: 10/09/2025 Site Ref: 6192/VCA Scale 1:50 approx	

Site Reference:	6192 VCA
Project Site:	Church Avenue
Project Location:	Middleton
Client:	C Brennan Developments Limited

Ground Gas Readings

Date - Time	BH	CH4 (%)	CO2 (%)	O2 (%)	H2S (ppm)	CO (ppm)	LEL (%)	aP (mb)	Flw (l/h)	H2O (m)
10/07/2025	WS1	0.0	2.0	19.0	0	0	0.0	1007	0.0	Dry
10/07/2025	WS2	0.0	0.1	20.7	0	0	0.0	1007	0.0	0.70
10/07/2025	WS3	0.0	0.8	20.1	0	0	0.0	1007	0.0	1.50
17/07/2025	WS1	0.0	1.4	19.8	0	0	0.0	999	0.0	Dry
17/07/2025	WS2	0.0	0.0	20.9	0	0	0.0	999	0.0	0.60
17/07/2025	WS3	0.0	1.5	19.8	0	0	0.0	999	0.0	1.45
14/08/2025	WS1	0.0	0.7	20.4	0	0	0.0	996	0.0	Dry
14/08/2025	WS2	0.0	0.0	20.9	0	0	0.0	997	0.0	0.75
14/08/2025	WS3	0.0	1.9	19.6	0	0	0.0	996	0.0	1.60
22/08/2025	WS1	0.0	0.5	20.3	0	0	0.0	1005	0.0	Dry
22/08/2025	WS2	0.0	0.0	20.6	0	0	0.0	1006	0.0	0.75
22/08/2025	WS3	0.0	0.9	20.2	0	0	0.0	1005	0.0	1.70
01/09/2025	WS1	0.0	0.1	20.7	0	0	0.0	979	0.0	Dry
01/09/2025	WS2	0.0	0.2	20.7	0	0	0.0	979	0.0	0.80
01/09/2025	WS3	0.0	1.2	20.1	0	0	0.0	978	0.0	1.75
09/09/2025	WS1	0.0	0.4	20.2	0	0	0.0	998	0.0	Dry
09/09/2025	WS2	0.0	0.2	20.5	0	0	0.0	998	0.0	0.70
09/09/2025	WS3	0.0	1.1	19.9	0	0	0.0	998	0.0	1.80

GeoAssist Limited

Appendix B2

6192 VCA Ground Gas Readings Assessment

Site Reference:	6192 VCA
Project Site:	Church Avenue
Project Location:	Middleton
Client:	C Brennan Developments Limited

Factual Data Summary										Interpretation & Risk Assessment					
BH Ref.	Response zone/strata	Evidence of Gas contamination	No of Monitoring occasions	Max. Recorded Methane	Max. Recorded Carbon Dioxide (%)	Min. Oxygen (%)	Max. Recorded Flow (L/hr)	Water Level (mbgl)	Atmospheric Pressure Range (mb)	Is Water Level within top 10% of the response zone?	Are readings considered representative	Explanation / Justification	Gas Screening Value (GSV) Methane*	Gas Screening Value (GSV) Carbon Dioxide*	Risk Classification & Characteristic Situation **
WS1	1.00 - 3.50 Made Ground over Clay	No	6	0.0	2.0	19.0	0.0	0.0	979-1007	No	Yes		0.000	0.002	Very Low Risk Characteristic Situation 2**
WS2	1.00 - 4.50 Made Ground over Sand and Clay	No	6	0.0	0.2	20.5	0.0	0.6	979-1007	Yes	Yes		0.000	0.000	Very Low Risk Characteristic Situation 1
WS3	1.00 - 4.00 Made Ground over Clay	No	6	0.0	1.9	19.6	0.0	1.5	978-1007	No	Yes		0.000	0.002	Very Low Risk Characteristic Situation 1
Worst Case	1.00 - 5.00 Made Ground over Sand and Gravel and Clay	No	18	0.0	2.0	19.0	0.0	Na	978-1007	Na	Na		0.000	0.002	Very Low Risk Characteristic Situation 2**

* Where no flow measured, GSV value is determined with an instrument minimum value of 0.1 L/hr

** Risk classification/Characteristic situation based on GSV and Methane >1% /CO2 >5% and other influencing factors

GeoAssist Limited

Appendix B2

6192 VCA Ground Gas Readings Assessment Risk Assessment

TEST DATE AND CONDITIONS			
Date		18/11/2024	
Atmospheric Pressure		994	mB
Ambient Temperature		20.8	°C
EnviroNics Serial No.		5089	

**GFM436 Final Inspection & Calibration
Check Certificate**

GAS DATA LTD

Unit D

Earlplace Business Park

Fletchamstead Highway

Coventry

CV4 9XL

Tel 02476303311



Fax 02476307711

Customer	GeoAssist Ltd
Certificate Number	125689
Order Number	340279

Serial Number	13237
Software Version	G436-00.0027/0010

Recalibration DUE Date
18/11/25

Instrument Checks					
Keyboard	✓		Display Contrast	✓	
Pump Flow In	500	Accept > 200 cc/min	Pump Flow @ -200mB	300	Accept > 200 cc/min
Clock Set / Running	✓		Labels Fitted	✓	

Gas Checks						
Sensor	CH ₄		CO ₂		O ₂	
	Instrument Gas	True Gas Value %	Instrument Gas	True Gas Value %	Instrument Gas	True Gas Value %
	Readings %		Readings %		Readings %	
	59.6	60	39.7	40	20.9	20.9
	Accept ±3.0		Accept ±3.0		Accept ±0.5	
	5.0	5	5.0	5	6.0	6
Zero Reading 100% N2	0.0	0	0.0	0	0.0	0
	Accept ±0.0		Accept ±0.0		Accept ±0.1	

Optional Gas Checks						
Applied Gas & Range		Concentration Tested @ (ppm)	Instrument Readings (ppm)			
Gas Type	Range (ppm)		Zero Reading		Instrument Gas Reading	
H2S	5000	1500	0	Accept ±0.0	1500	Accept ±5.0%
CO	2000	1000	0	Accept ±0.0	1001	Accept ±5.0%
Hexane	2.0%	2.0%	0	Accept ±0.0	1.99	Accept ±10.0%

Cross Gas Effects									
Applied Gas (ppm)		Instrument Readings (ppm)							
Gas Type	Concentration	Toxic 1:	H2S	Toxic 2:	CO	Toxic 3:	HEX		
H2S	1500	1500		0		0			
CO	1000	80		1001		0			
Hexane	2.0%	0		0		1.99			

Pressure Checks			
Atmospheric Pressure [AP] (mB)			
Current Atmospheric Pressure (mB)		Instrument Atmospheric Pressure Reading (mB)	
AP Open Ports		994	Accept ± 2.0
AP Port (Internal)	+800 mB	800	Accept ± 5.0
	+1200mh	1200	Accept ± 5.0

Flow Checks					
Borehole Flow			Differential Pressure		
Applied Reading (l/h)	Instrument Reading (l/h)		Applied Pressure (Pa)	Instrument Reading (Pa)	
-30	-30.1	Accept ± 3.0	-355	-360	Accept ± 50
-3	-3.0	Accept ± 1.0	-16	-16	Accept ± 6.0
0	0.0	Accept ± 0.0	0	0	Accept ± 0.5
3	3.0	Accept ± 0.5	16	16	Accept ± 3.0
30	30.3	Accept ± 3.0	377	386	Accept ± 50
60	60.0	Accept ± 6.0	1158	1158	Accept ± 130
90	91.4	Accept ± 9.0	2284	2360	Accept ± 250

Temperature Checks		
Calibration Temperature	Instrument Temperature Reading $^{\circ}\text{C}$	
Applied Temperature $^{\circ}\text{C}$		
-10	-10.0	Accept ± 2.0
0	0.0	Accept ± 1.0
30	30.0	Accept ± 1.0
60	60.0	Accept ± 1.0
100	100.0	Accept ± 1.0

Technician:
Jack Rutland

Date Tested:
18/11/2024

The instrument identified by the serial number stated above has been tested by Gas Data personnel for calibration accuracy on the date and under the ambient conditions stated. Gas Data Ltd internal BS EN ISO9001:2015, BS EN ISO14001:2015, BS EN ISO45001:2018 compliant workshop procedures were followed to apply known calibration test gases, gas flow rates, pressures and temperatures of the values stated. The results displayed on the instrument at each stage are recorded above.

Gas Data Ltd is certified to BS EN ISO9001:2015, BS EN ISO14001:2015, BS EN ISO45001:2018.

Appendix C

- C1 i2 Analytical Laboratory Test Results Soils**
- C2 Analysis of Soils Results with Assessment Criteria**



GeoAssist Ltd
Unit 4, Sheffield Street
Heaton Norris
Stockport
Cheshire
SK4 1RU

i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

e: info@geoassist.co.uk

t: 01923 225404
f: 01923 237404
e: reception@i2analytical.com

Analytical Report Number : 25-036362

Project / Site name:	Church Avenue Middleton	Samples received on:	09/07/2025
Your job number:	6192 VCA	Samples instructed on/ Analysis started on:	09/07/2025
Your order number:	2250708	Analysis completed by:	18/07/2025
Report Issue Number:	1	Report issued on:	18/07/2025
Samples Analysed:	6 soil samples		

Signed:

Rafał Szczepańczyk
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
air	- once the analysis is complete

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

Retention period for records and reports is minimum 6 years from the date of issue of the final report.
Some records may be kept for longer according to other legal/best practice requirements.

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: 25-036362
Project / Site name: Church Avenue Middleton
Your Order No: 2250708

Lab Sample Number	609196	609197	609198	609199	609200
Sample Reference	WS1	WS2	WS3	WS4	WS5
Sample Number	C1	C1	C1	C1	C1
Water Matrix	N/A	N/A	N/A	N/A	N/A
Depth (m)	0.30	0.30	0.30	0.30	0.30
Date Sampled	08/07/2025	08/07/2025	08/07/2025	08/07/2025	08/07/2025
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Test Limit of detection	Test Accreditation Status		

Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	8.4	27	14	15	24
Total mass of sample received	kg	0.1	NONE	0.7	0.7	0.7	0.7	0.7

Asbestos

Asbestos in Soil Detected/Not Detected	Type	N/A	ISO 17025	-	-	-	Not-detected	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	-	-	-	SCA	SCA
Analysis completed	N/A	N/A	N/A	-	-	-	17/07/2025	17/07/2025

General Inorganics

pH (L099)	pH Units	N/A	MCERTS	5.3	7.5	7.3	6.2	6
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Free Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Sulphate as SO ₄	%	0.005	MCERTS	0.049	0.066	0.059	0.055	0.056
Sulphide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Sulphur	mg/kg	50	MCERTS	260	350	250	310	340
Total Sulphur	%	0.005	MCERTS	0.026	0.035	0.025	0.031	0.034
Organic Matter (automated)	%	0.1	MCERTS	-	-	-	3.8	3.4

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	0.05	0.15	0.06	0.07
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	0.13	0.09	0.09	0.22
Fluorene	mg/kg	0.05	MCERTS	< 0.05	0.08	0.12	0.1	0.15
Phenanthrene	mg/kg	0.05	MCERTS	0.47	0.82	1	1.1	1.6
Anthracene	mg/kg	0.05	MCERTS	0.1	0.19	0.25	0.25	0.42
Fluoranthene	mg/kg	0.05	MCERTS	0.76	1.5	1.7	1.6	2.8
Pyrene	mg/kg	0.05	MCERTS	0.76	1.5	1.7	1.7	2.9
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.34	0.69	0.89	0.8	1.3
Chrysene	mg/kg	0.05	MCERTS	0.41	0.85	1	0.89	1.5
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	0.4	0.88	1	0.94	1.5
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	0.18	0.39	0.49	0.4	0.67
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.38	0.82	0.96	0.87	1.3
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.22	0.45	0.53	0.49	0.64
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	0.1	0.14	0.12	0.21
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.27	0.56	0.67	0.63	0.74

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	4.28	8.92	10.7	10	16
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Analytical Report Number: 25-036362
 Project / Site name: Church Avenue Middleton
 Your Order No: 2250708

Lab Sample Number				609196	609197	609198	609199	609200
Sample Reference				WS1	WS2	WS3	WS4	WS5
Sample Number				C1	C1	C1	C1	C1
Water Matrix				N/A	N/A	N/A	N/A	N/A
Depth (m)				0.30	0.30	0.30	0.30	0.30
Date Sampled				08/07/2025	08/07/2025	08/07/2025	08/07/2025	08/07/2025
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Test Limit of detection	Test Accreditation Status					

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	13	24	18	25	22
Barium (aqua regia extractable)	mg/kg	1	MCERTS	54	240	120	310	160
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.62	0.83	0.76	0.87	0.95
Boron (water soluble)	mg/kg	0.2	MCERTS	0.6	0.4	0.4	0.3	0.5
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	0.3	0.4	1	< 0.2
Chromium (hexavalent) Low Level	mg/kg	1.2	NONE	1.5	< 1.2	< 1.2	< 1.2	< 1.2
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	18	21	20	25	19
Copper (aqua regia extractable)	mg/kg	1	MCERTS	25	38	42	57	48
Lead (aqua regia extractable)	mg/kg	1	MCERTS	57	190	83	430	97
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	0.4	0.7	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	14	17	13	18	17
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	1.4	1.3	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	27	34	28	36	33
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	43	120	97	320	140

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

Analytical Report Number: 25-036362
Project / Site name: Church Avenue Middleton
Your Order No: 2250708

Lab Sample Number				609201
Sample Reference				WS6
Sample Number				C1
Water Matrix				N/A
Depth (m)				0.30
Date Sampled				08/07/2025
Time Taken				None Supplied
Analytical Parameter (Soil Analysis)	Units	Test Limit of detection	Test Accreditation Status	

Stone Content	%	0.1	NONE	< 0.1
Moisture Content	%	0.01	NONE	9.8
Total mass of sample received	kg	0.1	NONE	0.7

Asbestos

Asbestos in Soil Detected/Not Detected	Type	N/A	ISO 17025	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	SCA
Analysis completed	N/A	N/A	N/A	17/07/2025

General Inorganics

pH (L099)	pH Units	N/A	MCERTS	7
Total Cyanide	mg/kg	1	MCERTS	< 1.0
Free Cyanide	mg/kg	1	MCERTS	< 1.0
Total Sulphate as SO ₄	%	0.005	MCERTS	0.034
Sulphide	mg/kg	1	MCERTS	< 1.0
Total Sulphur	mg/kg	50	MCERTS	260
Total Sulphur	%	0.005	MCERTS	0.026
Organic Matter (automated)	%	0.1	MCERTS	2.4

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	0.08
Fluorene	mg/kg	0.05	MCERTS	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	0.72
Anthracene	mg/kg	0.05	MCERTS	0.17
Fluoranthene	mg/kg	0.05	MCERTS	1.3
Pyrene	mg/kg	0.05	MCERTS	1.3
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.56
Chrysene	mg/kg	0.05	MCERTS	0.68
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	0.73
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	0.33
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.65
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.31
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.37

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	7.12
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 Project / Site name: Church Avenue Middleton
 Your Order No: 2250708

Lab Sample Number				609201
Sample Reference				WS6
Sample Number				C1
Water Matrix				N/A
Depth (m)				0.30
Date Sampled				08/07/2025
Time Taken				None Supplied
Analytical Parameter (Soil Analysis)	Units	Test Limit of detection	Test Accreditation Status	

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	17
Barium (aqua regia extractable)	mg/kg	1	MCERTS	97
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.59
Boron (water soluble)	mg/kg	0.2	MCERTS	0.3
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.2
Chromium (hexavalent) Low Level	mg/kg	1.2	NONE	< 1.2
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	19
Copper (aqua regia extractable)	mg/kg	1	MCERTS	37
Lead (aqua regia extractable)	mg/kg	1	MCERTS	84
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	0.5
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	15
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	1.2
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	30
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	85

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

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* 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 *
609196	WS1	C1	0.3	Brown loam and clay with gravel and vegetation
609197	WS2	C1	0.3	Brown loam and clay with gravel and vegetation
609198	WS3	C1	0.3	Brown loam and clay with gravel and vegetation
609199	WS4	C1	0.3	Brown loam and clay with gravel and vegetation
609200	WS5	C1	0.3	Brown loam and clay with gravel and vegetation
609201	WS6	C1	0.3	Brown loam and clay with gravel and vegetation

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Project / Site name: Church Avenue Middleton

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters Heating/Cooling (PrW) DI Process Water (DI PrW)

Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode	In-house method	L010-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically (up to 30°C)	In-house method	L019B	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.	L019B	D	NONE
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	L038B	D	MCERTS
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	L038B	D	MCERTS
Total sulphate (as SO ₄ in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES	In-house method	L038B	D	MCERTS
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES	In-house method	L038B	D	MCERTS
Speciated PAHs and/or Semi-volatile organic compounds in soil	Determination of semi-volatile organic compounds (including PAH) in soil by extraction in dichloromethane and hexane followed by GC-MS	In-house method based on USEPA 8270	L064B	D	MCERTS
Hexavalent chromium in soil (low level)	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry	In-house method	L080-PL	W	NONE
Free cyanide in soil	Determination of free cyanide by distillation followed by colorimetry	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080-PL	W	MCERTS
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080-PL	W	MCERTS
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080-PL	W	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement	In-house method	L099-PL	D	MCERTS
Soil Descriptions	Textural classification	In-house method	L019B	W	NONE
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, 2021	A001B	D	ISO 17025

Analytical Report Number : 25-036362

Project / Site name: Church Avenue Middleton

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters Heating/Cooling (PrW) DI Process Water (DI PrW)

Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Organic matter (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate (Walkley Black Method)	In-house method	L009B	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.

Quality control parameter failure associated with individual result applies to calculated sum of individuals.

The result for sum should be interpreted with caution

Soils Risk Assessment

Site Reference:6192VCA

Project Site:Church Avenue

Project Location:Middleton

Client:C Brennan Developments Limited

i2 Reference	0	WS1	WS2	WS3	WS4	WS5	WS6
Customer Sample Ref:	C4SL / S4UL	C1 - 0.30m	C1 - 0.30m	C1 - 0.30m	C1 - 0.30m	C1 - 0.30m	C1 - 0.30m
	SOM 1% GAC	08/07/2025	08/07/2025	08/07/2025	08/07/2025	08/07/2025	08/07/2025
Determinand							
Arsenic	37	13	24	18	25	22	17
	1300						
Boron (water-soluble)	290	0.6	0.4	0.4	0.3	0.5	0.3
Cadmium	22	0.2	0.3	0.4	1	0.2	0.2
Chromium*	910	18	21	20	25	19	19
Chromium VI	21	1.5	1.2	1.2	1.2	1.2	1.2
Copper	2400	25	38	42	57	48	37
Cyanide(Total)	-	1	1	1	1	1	1
Cyanide(free)**	34	1	1	1	1	1	1
Lead	200	57	190	83	430	97	84
Mercury†	200	0.3	0.3	0.4	0.7	0.3	0.5
Nickel	130	14	17	13	18	17	15
pH	-	5.3	7.5	7.3	6.2	6	7
Phenols(Mono)	120	1	1	1	1	1	1
Selenium	250	1.4	1.3	1	1	1	1.2
SO4(Total)	-	0.049	0.066	0.059	0.055	0.056	0.034
Sulphide	-	1	1	1	1	1	1
Sulphur(Free)	-	260	350	250	310	340	260
Thiocyanate	-	0	0	0	0	0	0
Zinc	3700	43	120	97	320	140	85
Acenaphthene	210	0.05	0.13	0.09	0.09	0.22	0.08
Acenaphthylene	170	0.05	0.05	0.05	0.05	0.05	0.05
Anthracene	2400	0.1	0.19	0.25	0.25	0.42	0.17
Benzo(a)Anthracene	7.2	0.34	0.69	0.89	0.8	1.3	0.56
Benzo(a)Pyrene SM	5	0.38	0.82	0.96	0.87	1.3	0.65
Benzo(b)Fluoranthene	2.6	0.4	0.88	1	0.94	1.5	0.73
Benzo(ghi)Perylene	320	0.27	0.56	0.67	0.63	0.74	0.37
Benzo(k)Fluoranthene	77	0.18	0.39	0.49	0.4	0.67	0.33
Chrysene	15	0.41	0.85	1	0.89	1.5	0.68
Dibenzo(ah)Anthracene	0.24	0.05	0.1	0.14	0.12	0.21	0.05
Fluoranthene	280	0.76	1.5	1.7	1.6	2.8	1.3
Fluorene	170	0.05	0.08	0.12	0.1	0.15	0.05
Indeno(123-cd)Pyrene	27	0.22	0.45	0.53	0.49	0.64	0.31
Naphthalene	2.3	0.05	0.05	0.15	0.06	0.07	0.05
Phenanthrene	95	0.47	0.82	1	1.1	1.6	0.72
Pyrene	620	0.76	1.5	1.7	1.7	2.9	1.3
PAH(total)	500	4.28	8.92	10.7	10	16	7.12
Asbestos	Not-detected	-	-	-	Not-detected	Not-detected	Not-detected
SOM†	-	-	-	-	4	3	2

All Units mg/kg unless otherwise stated

Where no SOM is reported 1% SOM Criteria are used. For individual samples SOM value is used to adjust the assessment criteria accordingly that that sample.

*Criteria Assumes Chromium III

SM = Surrogate Marker Approach Culp et al

**Criteria is derived considering acute effects on 1-2yo Female Receptor ingesting a single dose of 3g of soil

***Criteria is derived considering Total TPH (C10 to C35) is formed entirley of a 50:50 Aliphatic and Aromatic Split C8-C10 range

¹ GAC for inorganic mercury can normally be compared with chemical analysis for total mercury content because the equilibrium concentrations of elemental and methylmercury are likely to be very low

[†] Criteria reported to zero decimal places

Basis of Assessment Criteria: CLEA v1.071 EA 2005 WAC (Human Health Value) C4SL