



***Client:***

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91 Kingswood Road  
Withington  
Manchester  
M14 6RY

***Architect/Consultant***

Holborow & Ormesher Ltd  
Station House  
Adams Hill  
Knutsford  
Cheshire  
WA16 6DN

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**Phase II Contaminated Land Risk Assessment**

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**91 Kingswood Road, Withington, Manchester**

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Jan 2022

Site Ref: 6083/VKW-CLRA v1.00

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-

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**1. Introduction**

This report is an account of a Phase II Contaminated Land Risk Assessment carried out by GeoAssist Limited at the request of the Client Mr I Butt for the proposed development on 91 Kingswood Road, Withington, Manchester. The work was commissioned following acceptance of the quotation and an instruction to proceed issued by Holborow & Ormesher Ltd on behalf of the Client Mr I Butt 11th November 2021.

The purpose of this Phase II investigation is to provide information following the completion of a Phase I 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 National Planning Policy Framework March 2012
- Is suitable for the intended proposed land use. In this case, as a Residential development with home grown produce.

The approximate grid reference for the centre of the site is 386270, 393510 and the total area of the site is approximately 500m<sup>2</sup>. 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 in a suburban setting adjacent to 91 Kingswood Road, Withington, Manchester.

The site forms a roughly triangular shape, and the topography is relatively level across the site and with the surrounding area. The site forms part of the garden of the neighbouring property and at the time of the site visit consisted of cleared land.

The boundary of the site is formed by residential property to the east and northeast. Kingswood Road and Cringle Brook bound the site to the south and northwest respectively, over both of which lies more residential property. Mature trees are present along the boundary with Cringle Brook.

Apart from some obvious surface builders rubble no visual or olfactory observations of contaminants were noted

during the site walkover.

## **2.2 Proposed**

It is understood that the proposed development comprises 1 number detached residential dwelling house with a cellar and associated off road car parking, soft landscaping and residential garden.

## **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. Intrusive Investigation**

### **4.1 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.

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.

### **4.2 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: 2011 Investigation of potentially contaminated sites where relevant.

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

The analytical testing was carried out in an independent UKAS accredited Laboratory.

#### **4.3 Methods Used For Forming Exploratory Holes**

The exploratory holes undertaken across the site as part of this investigation were established using dynamic drive sampling techniques. Information obtained from the Phase I was used to inform a decision on the actual exploratory hole locations whilst taking account of positions that could be reasonably accessed with minimal preparation works using the excavation plant available. The location of services was also considered during the positioning of the exploratory holes along with the position of any proposed soft landscaping areas. A plan showing the locations of the exploratory holes established as part of the investigation forms Appendix A1 to this report.

#### **4.4 Exploratory Hole Programme**

In total three exploratory holes referenced WS1, WS2 and WS3 were undertaken at the locations as shown on the site plan in Appendix A1.

The details of the strata in the exploratory holes were recorded by a suitably qualified Professional Engineer. Upon completion of the fieldwork the exploratory holes were backfilled in accordance with the specification in order to prevent the establishment of any potential pollutant pathways and the surface reinstated.

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 was completed on in a single visit to site on 23<sup>rd</sup> Nov 2021.

#### **4.5 Field Sampling and Testing**

A non-targeted exploratory hole layout was selected as the most appropriate strategy for this site based on the findings of the Phase I. 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. Observations of groundwater conditions were recorded throughout the fieldwork operations. 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) was used to indicate the likelihood of the presence of volatile organic compounds during the fieldwork and in the laboratory. The results are indicated on the Borehole logs only where readings in excess of 10ppm were monitored. Readings in excess of 50ppm indicate that samples are required to be tested for Volatile Organic Compounds. No samples were found to exceed 10ppm.

## 5. Laboratory Investigation

### 5.1 Contamination Testing

In total three 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.

**Table 5.1** Analytical Determinands

| 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              |                        |
| Sulphur(Free)         | Asbestos screen & ID   |
| Thiocyanate           |                        |
| Zinc                  |                        |

## 6. Subsurface Stratigraphy

The subsoil profile obtained from the exploratory holes consists of Made Ground overlying gravelly sandy silty clays with sand inclusions and silty sand/sandstone at depth. The clays are generally stiff and high strength and low plasticity.

**Table 6.0** Subsoil Profile Summary

| Strata                                                                                                | Depth of Strata<br>(m) below ground level |                                                                 |
|-------------------------------------------------------------------------------------------------------|-------------------------------------------|-----------------------------------------------------------------|
|                                                                                                       | Top                                       | Base                                                            |
| Made Ground<br>Variable mixed clay and granular                                                       | Ground Level                              | 0.20 to 0.60                                                    |
| Upper Superficial Natural Deposits<br>Gravelly sandy to very sandy silty Clay with roots and rootlets | 0.20 to 0.60                              | 1.30 to 1.70<br>With sand horizon to 2.00m<br>in WS2            |
| Superficial Natural Deposits<br>Stiff gravelly sandy silty Clay                                       | 1.30 to 1.70                              | 2.50 to 3.30<br>With sand and gravel horizon<br>to 3.70m in WS3 |
| Silty Sand/Sandstone                                                                                  | 3.20 to 3.70                              | Not proven                                                      |

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

## 7. Groundwater

Seepage groundwater was encountered in the exploratory hole WS3 at a depth of 3.70m during the course of the fieldwork. 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.

## 8. Ground Gas

The subsurface stratigraphy has demonstrated that no significant depth of made ground deposits exist beneath the site and no putrescible materials were present capable of generating significant volumes of ground gases at quantities and pressures such that the proposed development is likely to be impacted by ground gases.

Consequently, the risk to any future development from potential ground gas ingress is classified as low based on the ground conditions actually encountered in the exploratory holes and no particular measures will need to be adopted based on the recommendations within Ciria C665 and Claire RB 17 best practice guidance.

## 9. 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.

### 9.1 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 or Suitable 4 Use Levels as given as part of Appendix C2.

The GeoAssist Limited GACs and Category 4 Screening levels (C4SLs and S4UL herein) are generated in consideration of the proposed end use of the site, in this case as Residential land with edible plant uptake. 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.

## 9.2 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 edible plant uptake as this is considered to be the most appropriate land use scenario for the current and 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 have been used in conjunction with the above GAC 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.

### 9.3 Subsoil Deposits

The contaminants that were identified above the GeoAssist Limited GACs, SGVs or C4SLs for a Residential end use from the GeoAssist Limited investigations are summarized below:

**Table 9.3** Summary identified impacts.

| Determinand | GAC<br>(mg/kg)<br>Residential | Total<br>tests<br>/ impacted<br>strata<br>(Made Ground) | No. of<br>No. of<br>in<br>strata | No of<br>samples<br>exceeding<br>SGV/GAC/<br>C4SL | Max Value<br>(mg/kg) | Treat as<br>Hotspot | US95<br>Value | Further action required                                            |
|-------------|-------------------------------|---------------------------------------------------------|----------------------------------|---------------------------------------------------|----------------------|---------------------|---------------|--------------------------------------------------------------------|
| Lead        | 200                           | 3/3                                                     |                                  | 2                                                 | 380                  | No                  | na            | Yes remediate Made Ground in soft landscaped areas of final scheme |
| B[a]P       | 5                             | 3/3                                                     |                                  | 2                                                 | 6.5                  | No                  | na            | Yes remediate Made Ground in soft landscaped areas of final scheme |

The analytical laboratory test results and analysis are presented in appendix C1 & C2 and have identified potential moderate risks to end users of the Site from elevated levels of anthropogenic contamination within the near surface soils on the Site. Namely elevated levels of Lead and Benzo(a)Pyrene within samples of made ground only. The results confirm that Asbestos fibres have not been identified within the made ground submitted to the analysis laboratory for testing.

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.

### 9.4 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.

#### 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 and a remediation scheme will need to be approved by the Local Planning Authority and subsequently implemented and confirmed by validation testing.

## 10. 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 10.0** 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                        |
|--------------------------------------------------------------------------------------------|------------------------------------------------------------------------|-------------------------------------|-------------------------------------------|-------------------------------------------|
| <i>Previous ON SITE Land uses:</i>                                                         |                                                                        |                                     |                                           |                                           |
| 1. Previous and Current Land Use Residential Garden                                        | Ground contamination<br><b>Moderate Risk</b>                           | Lead<br>B[a]P                       | Dermal Contact<br>Ingestion<br>Inhalation | Site Users                                |
|                                                                                            | Gas from in-filled ground<br><b>Low Risk</b>                           | None                                | Vertical and Lateral Migration            | Site Users<br>Future Buildings & Services |
| <i>Previous OFF SITE land uses within 250m as indicated by Historical Plans Including:</i> |                                                                        |                                     |                                           |                                           |
| 2. Pond Feature (potentially Infilled)                                                     | Ground contamination<br><b>Low Risk</b>                                | None                                | None                                      | Site Users<br>Construction workers        |
|                                                                                            | Gas from in-filled ground<br><b>Low Risk</b><br>Given age and distance | None                                | None                                      | Site Users<br>Future Buildings & Services |
| 3. Railway Embankment                                                                      | Ground contamination<br><b>Low Risk</b>                                | None                                | None                                      | Site Users<br>Construction workers        |
|                                                                                            | Gas from in-filled ground<br><b>Low Risk</b>                           | None                                | None                                      | Site Users<br>Future Buildings & Services |
| 4. Coal Workings & Mineral Extraction                                                      | Geotechnical Hazard<br><b>Low Risk</b>                                 | -                                   | -                                         | -                                         |
|                                                                                            | Ground contamination<br><b>Low Risk</b>                                | None                                | None                                      | Site Users<br>Future Buildings & Services |
|                                                                                            | Mine Gas<br><b>Low Risk</b>                                            | None                                | None                                      | Site Users<br>Future Buildings & Services |

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.

## 11. Conclusions

Evidence presented elsewhere within this report indicates that the site presents a **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 an approved remedial action plan.

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

### 11.1 Supplementary Recommendations

None.



Matthew Benson MSc. GMICE  
Geotechnical/Environmental Engineer



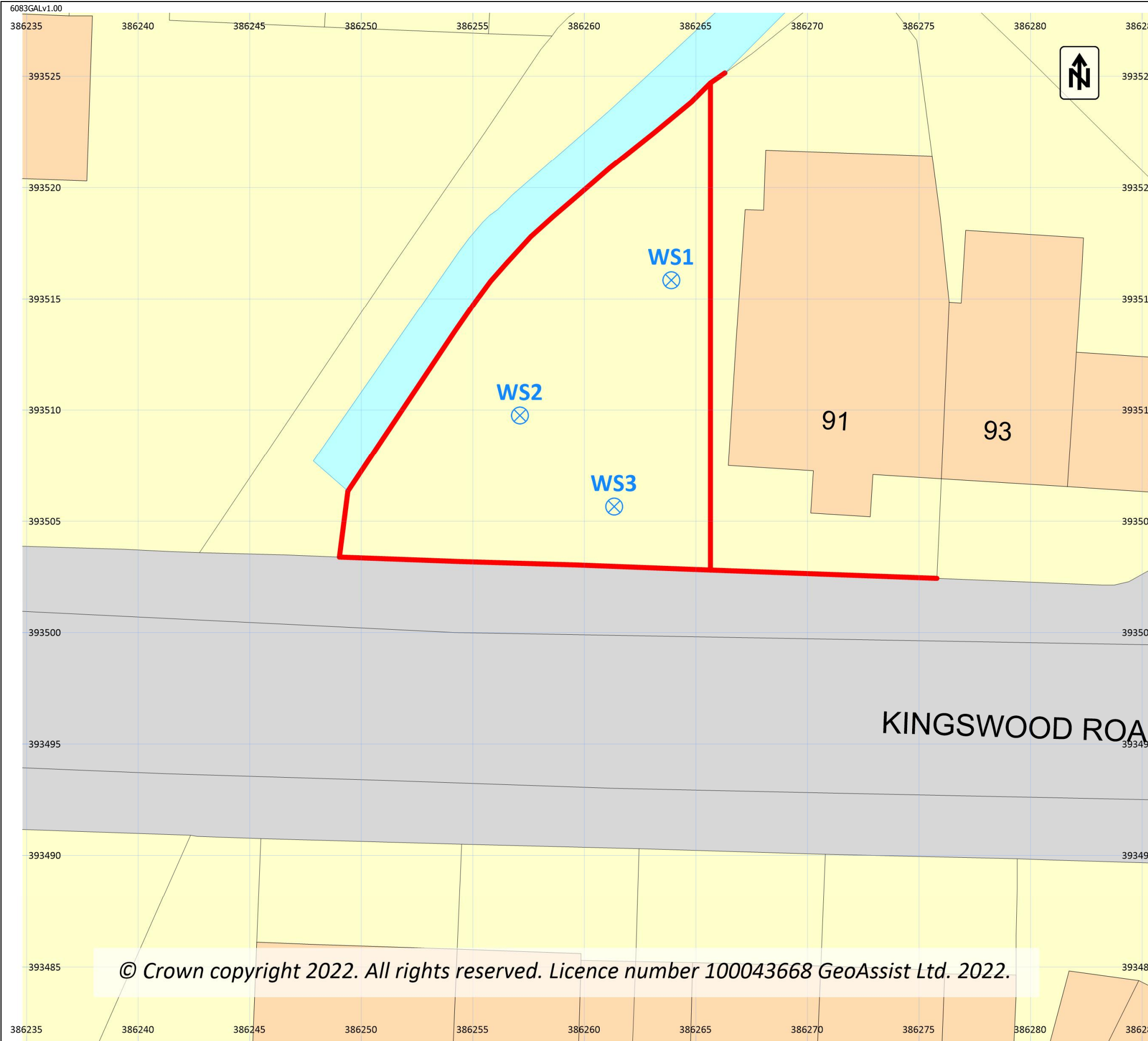
Mark Richardson MSc CEng MICE  
Technical Director

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, care and diligence within the terms of the contract with Mr I Butt. The report is confidential to Mr I Butt, 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. Mr I Butt may use the report for their/her/his own purposes.

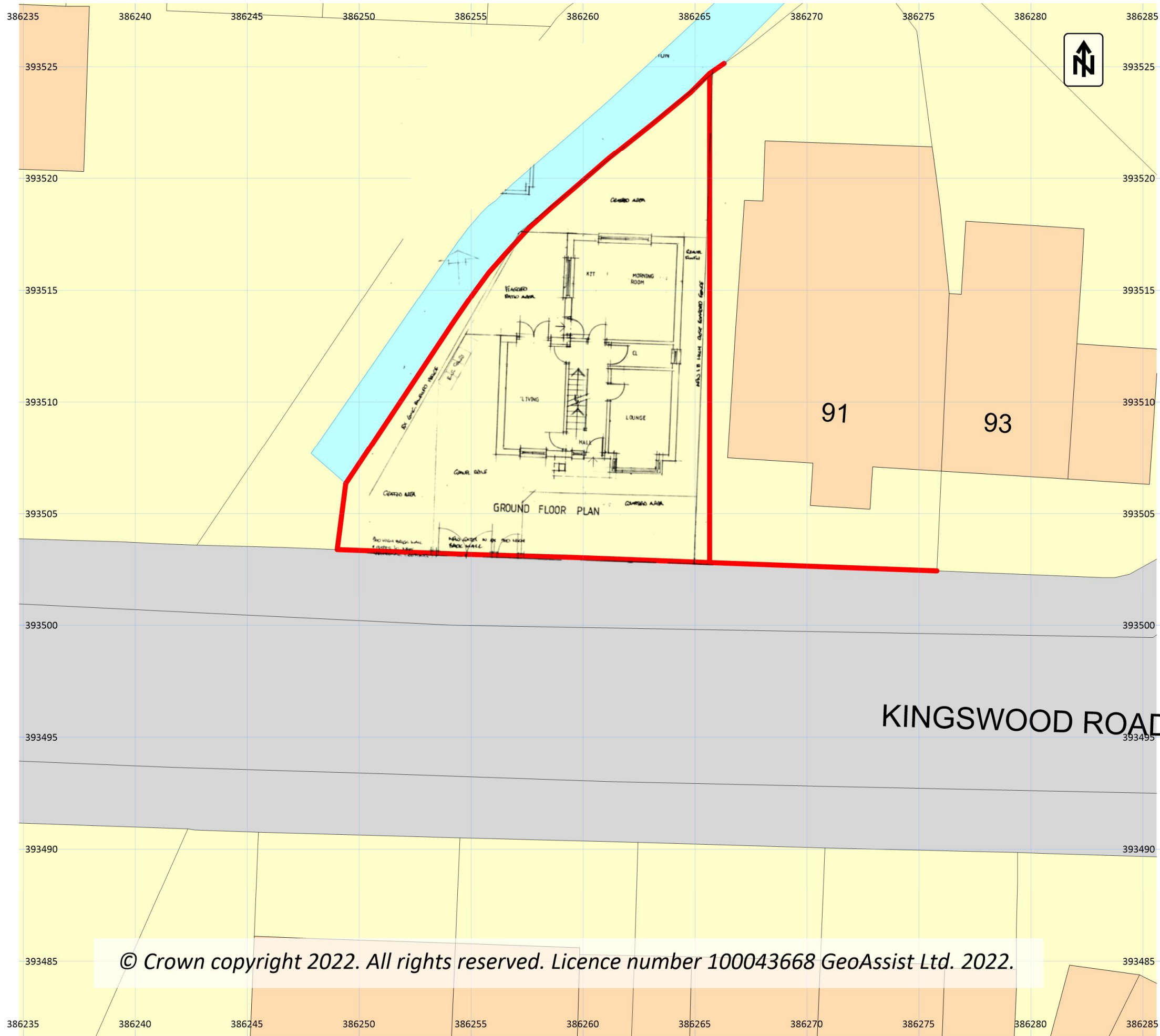
## **Appendix A**

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



# A1 Site Plan

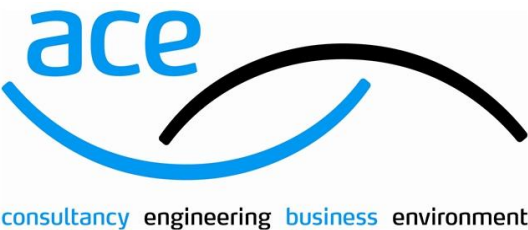
|                      |                                                          |
|----------------------|----------------------------------------------------------|
| Site Name            | 91 Kingswood Road                                        |
| Location             | Withington, Manchester                                   |
| GeoAssist Ref        | 6083VKW                                                  |
| Client               | Mr I Butt                                                |
|                      | 91 Kingswood Road<br>Withington<br>Manchester<br>M14 6RY |
| Planning Consultant  |                                                          |
| NGR (centre of site) | 386270,393510                                            |
| Production Date      | Jan 2022                                                 |
| Survey Method        |                                                          |
| Surveyor             | Others                                                   |
| Status               | Final v1.00                                              |
|                      |                                                          |
| Base Survey          | OSGB36                                                   |



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# A2 Proposed Plan

|                      |                                                          |
|----------------------|----------------------------------------------------------|
| Site Name            | 91 Kingswood Road                                        |
| Location             | Withington, Manchester                                   |
| GeoAssist Ref        | 6083VKW                                                  |
| Client               | Mr I Butt                                                |
|                      | 91 Kingswood Road<br>Withington<br>Manchester<br>M14 6RY |
| Planning Consultant  |                                                          |
| NGR (centre of site) | 386270,393510                                            |
| Production Date      | Jan 2022                                                 |
| Survey Method        |                                                          |
| Surveyor             | Others                                                   |
| Status               | Final v1.00                                              |
| Base Survey          | OSGB36                                                   |



## Appendix B

### B1 Exploratory Hole Logs

[illegible]

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |  |                                                                |                            |                                            |                                       |                                                                                                                                                                 |                                                                                                                             |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|----------------------------------------------------------------|----------------------------|--------------------------------------------|---------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|---------------|
| <b>GeoAssist Limited</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  | <b>Exploratory Hole Record Sheet</b>                           |                            |                                            |                                       |                                                                                                                                                                 | Ref: <b>WS2</b>                                                                                                             |               |
| <b>Consultant:</b><br>Holborow & Ormesher Ltd                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |  | Project: 91 Kingswood Road<br>Location: Withington, Manchester |                            |                                            |                                       |                                                                                                                                                                 | Sheet: 1                                                                                                                    |               |
| <b>Client:</b><br>Mr Butt                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |  | Equipment:<br>Archway Dart Rig                                 |                            |                                            |                                       |                                                                                                                                                                 | Ground Level: 41.28 m.AOD<br>Co-ordinates: Easting: 386257.1(m)<br>Northing: 393509.8(m)<br>Dates: 23/11/2021 to 23/11/2021 |               |
| Drilling Foreman: M Walton<br><b>STRATUM DESCRIPTION</b><br>Engineer/Geologist: M Benson                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  | Depth<br>(Thick)<br>(m)                                        | Reduced<br>Level<br>(mAOD) | Strata<br>Legend/<br>Standpipe<br>Backfill | Samples/Tests<br>Depth (m)<br>from to |                                                                                                                                                                 |                                                                                                                             | Field Records |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |  |                                                                |                            |                                            | Sample<br>Type/No                     | Blow<br>Count<br>N/(U)                                                                                                                                          |                                                                                                                             |               |
| 0 Dark brown clayey silty sand with rootlets and occasional brick fragments - MADE GROUND                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |  | (0.60)<br>0.60                                                 | 40.68                      |                                            | 0.20 0.30                             | C1                                                                                                                                                              |                                                                                                                             |               |
| 1 Brown clayey silty SAND with rootlets                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |  | (0.70)<br>1.30                                                 | 39.98                      |                                            | 1.00 1.20                             | CP1<br>D1                                                                                                                                                       | 16                                                                                                                          |               |
| 2 Brown clayey silty SAND with occasional cobbles                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |  | (0.70)<br>2.00                                                 | 39.28                      |                                            | 2.00                                  | CP2                                                                                                                                                             | 5                                                                                                                           |               |
| 3 Stiff brown gravelly sandy silty CLAY with occasional sand inclusions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |  | (1.20)<br>3.20                                                 | 38.08                      |                                            | 2.60 2.70<br>3.00                     | D2<br>CP3                                                                                                                                                       | 15                                                                                                                          |               |
| 4 Very dense orange/brown silty fine to medium SAND with dark grey staining - weathered Sandstone                                                                                                                                                                                                                                                                                                                                                                                                                                                         |  | (0.82)<br>4.02                                                 | 37.26                      |                                            |                                       |                                                                                                                                                                 |                                                                                                                             |               |
| Exploratory Hole complete at 4.02m                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  |                                                                |                            |                                            |                                       |                                                                                                                                                                 |                                                                                                                             |               |
| 5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |  |                                                                |                            |                                            |                                       |                                                                                                                                                                 |                                                                                                                             |               |
| 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |  |                                                                |                            |                                            |                                       |                                                                                                                                                                 |                                                                                                                             |               |
| 7                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |  |                                                                |                            |                                            |                                       |                                                                                                                                                                 |                                                                                                                             |               |
| 8                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |  |                                                                |                            |                                            |                                       |                                                                                                                                                                 |                                                                                                                             |               |
| 9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |  |                                                                |                            |                                            |                                       |                                                                                                                                                                 |                                                                                                                             |               |
| 10                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  |                                                                |                            |                                            |                                       |                                                                                                                                                                 |                                                                                                                             |               |
| <b>Remarks:</b> 23/11/2021: Inspection pit excavated to 1.00m depth to avoid services<br><br>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.<br>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. |  |                                                                |                            |                                            |                                       | <b>Logged:</b> M Benson<br><b>Date:</b> 25/11/2021<br><b>Checked:</b> M Richardson<br><b>Date:</b> 25/11/2021<br><b>Site Ref:</b> 6083/VKW<br><b>Scale 1:50</b> |                                                                                                                             |               |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |  |                                                                |                            |                                            |                                       |      |                                                                                                                                                                 |                        |                                     |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|----------------------------------------------------------------|----------------------------|--------------------------------------------|---------------------------------------|------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|-------------------------------------|
| <b>GeoAssist Limited</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  | <b>Exploratory Hole Record Sheet</b>                           |                            |                                            |                                       |      | Ref: <b>WS3</b>                                                                                                                                                 |                        |                                     |
| <b>Consultant:</b><br>Holborow & Ormesher Ltd                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |  | Project: 91 Kingswood Road<br>Location: Withington, Manchester |                            |                                            |                                       |      | Sheet: 1                                                                                                                                                        |                        |                                     |
| <b>Client:</b><br>Mr Butt                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |  | Equipment:<br>Archway Dart Rig                                 |                            |                                            |                                       |      | Ground Level: 41.31 m.AOD<br>Co-ordinates: Easting: 386261.3(m)<br>Northing: 393505.7(m)<br>Dates: 23/11/2021 to 23/11/2021                                     |                        |                                     |
| Drilling Foreman: M Walton<br><b>STRATUM DESCRIPTION</b><br>Engineer/Geologist: M Benson                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  | Depth<br>(Thick)<br>(m)                                        | Reduced<br>Level<br>(mAOD) | Strata<br>Legend/<br>Standpipe<br>Backfill | Samples/Tests<br>Depth (m)<br>from to |      |                                                                                                                                                                 | Blow<br>Count<br>N/(U) | Field Records                       |
| 0 Dark brown sandy gravel with brick fragments - MADE GROUND                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |  | 0.20                                                           | 41.11                      |                                            | 0.20                                  | 0.30 | C1                                                                                                                                                              |                        |                                     |
| Brown sandy silty clay with occasional brick fragments and rootlets - MADE GROUND                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |  | 0.40                                                           | 40.91                      |                                            |                                       |      |                                                                                                                                                                 |                        |                                     |
| Brown gravelly sandy to very sandy silty CLAY                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |  | (0.90)                                                         |                            |                                            | 1.00                                  |      | CP1                                                                                                                                                             | 3                      |                                     |
| 1 Stiff brown gravelly sandy silty CLAY                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |  | 1.30                                                           | 40.01                      |                                            | 1.40                                  | 1.50 | D1                                                                                                                                                              |                        | Hand penetrometer at 1.40m - 112kPa |
| 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |  | (1.20)                                                         |                            |                                            | 2.00                                  |      | CP2                                                                                                                                                             | 11                     |                                     |
| Medium dense brown with dark grey staining silty fine to medium SAND                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  | 2.50                                                           | 38.81                      |                                            | 2.80                                  | 2.90 | D2                                                                                                                                                              |                        |                                     |
| 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |  | (0.70)                                                         |                            |                                            | 3.00                                  |      | CP3                                                                                                                                                             | 28                     |                                     |
| Brown with dark grey sandy GRAVEL                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |  | (0.50)                                                         |                            |                                            |                                       |      |                                                                                                                                                                 |                        |                                     |
| 3.70                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  |                                                                |                            |                                            |                                       |      |                                                                                                                                                                 |                        |                                     |
| 4 Very dense orange/brown silty fine to medium SAND - weathered Sandstone                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |  | (0.45)                                                         |                            |                                            |                                       |      |                                                                                                                                                                 |                        |                                     |
| 4.15                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  |                                                                |                            |                                            |                                       |      |                                                                                                                                                                 |                        |                                     |
| Exploratory Hole complete at 4.15m                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  |                                                                |                            |                                            |                                       |      |                                                                                                                                                                 |                        |                                     |
| 5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |  |                                                                |                            |                                            |                                       |      |                                                                                                                                                                 |                        |                                     |
| 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |  |                                                                |                            |                                            |                                       |      |                                                                                                                                                                 |                        |                                     |
| 7                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |  |                                                                |                            |                                            |                                       |      |                                                                                                                                                                 |                        |                                     |
| 8                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |  |                                                                |                            |                                            |                                       |      |                                                                                                                                                                 |                        |                                     |
| 9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |  |                                                                |                            |                                            |                                       |      |                                                                                                                                                                 |                        |                                     |
| 10                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  |                                                                |                            |                                            |                                       |      |                                                                                                                                                                 |                        |                                     |
| <b>Remarks:</b> 23/11/2021: Inspection pit excavated to 1.00m depth to avoid services<br><br>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.<br>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. |  |                                                                |                            |                                            |                                       |      | <b>Logged:</b> M Benson<br><b>Date:</b> 25/11/2021<br><b>Checked:</b> M Richardson<br><b>Date:</b> 25/11/2021<br><b>Site Ref:</b> 6083/VKW<br><b>Scale 1:50</b> |                        |                                     |

## **Appendix C**

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



**Matthew Benson**  
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## **Analytical Report Number : 21-25698**

|                             |                              |                                                        |            |
|-----------------------------|------------------------------|--------------------------------------------------------|------------|
| <b>Project / Site name:</b> | 91 Kingswood Road Withington | <b>Samples received on:</b>                            | 26/11/2021 |
| <b>Your job number:</b>     | 6083 VKW                     | <b>Samples instructed on/<br/>Analysis started on:</b> | 26/11/2021 |
| <b>Your order number:</b>   | 2211128                      | <b>Analysis completed by:</b>                          | 09/12/2021 |
| <b>Report Issue Number:</b> | 1                            | <b>Report issued on:</b>                               | 09/12/2021 |
| <b>Samples Analysed:</b>    | 3 soil samples               |                                                        |            |

*Izabela Wójcik*  
**Signed:**

Izabela Wójcik  
Technical Reviewer (Reporting Team)  
**For & on behalf of i2 Analytical Ltd.**

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

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

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

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

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

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

Analytical Report Number: 21-25698  
Project / Site name: 91 Kingswood Road Withington  
Your Order No: 2211128

|                                         |       |                    |                         |               |               |               |
|-----------------------------------------|-------|--------------------|-------------------------|---------------|---------------|---------------|
| Lab Sample Number                       |       |                    |                         | 2097783       | 2097784       | 2097785       |
| Sample Reference                        |       |                    |                         | WS1           | WS2           | WS3           |
| Sample Number                           |       |                    |                         | C1            | C1            | C1            |
| Depth (m)                               |       |                    |                         | 0.20          | 0.20          | 0.20          |
| Date Sampled                            |       |                    |                         | 24/11/2021    | 24/11/2021    | 24/11/2021    |
| Time Taken                              |       |                    |                         | None Supplied | None Supplied | None Supplied |
| Analytical Parameter<br>(Soil Analysis) | Units | Limit of detection | Accreditation<br>Status |               |               |               |
| Stone Content                           | %     | 0.1                | NONE                    | < 0.1         | < 0.1         | < 0.1         |
| Moisture Content                        | %     | 0.01               | NONE                    | 16            | 12            | 18            |
| Total mass of sample received           | kg    | 0.001              | NONE                    | 0.40          | 0.40          | 0.40          |

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

#### General Inorganics

|                                   |          |       |        |       |       |       |
|-----------------------------------|----------|-------|--------|-------|-------|-------|
| pH - Automated                    | pH Units | N/A   | MCERTS | 7.0   | 7.9   | 7.5   |
| Total Cyanide                     | mg/kg    | 1     | MCERTS | < 1.0 | 1.0   | < 1.0 |
| Free Cyanide                      | mg/kg    | 1     | MCERTS | < 1.0 | < 1.0 | < 1.0 |
| Thiocyanate as SCN                | mg/kg    | 5     | NONE   | < 5.0 | < 5.0 | < 5.0 |
| Total Sulphate as SO <sub>4</sub> | %        | 0.005 | MCERTS | 0.048 | 0.063 | 0.066 |
| Sulphide                          | mg/kg    | 1     | MCERTS | < 1.0 | 14    | < 1.0 |
| Total Sulphur                     | %        | 0.005 | MCERTS | 0.039 | 0.062 | 0.045 |

#### Total Phenols

|                            |       |   |        |       |       |       |
|----------------------------|-------|---|--------|-------|-------|-------|
| Total Phenols (monohydric) | mg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 |
|----------------------------|-------|---|--------|-------|-------|-------|

#### Speciated PAHs

|                        |       |      |        |        |      |      |
|------------------------|-------|------|--------|--------|------|------|
| Naphthalene            | mg/kg | 0.05 | MCERTS | < 0.05 | 0.20 | 0.23 |
| Acenaphthylene         | mg/kg | 0.05 | MCERTS | < 0.05 | 0.51 | 0.22 |
| Acenaphthene           | mg/kg | 0.05 | MCERTS | < 0.05 | 0.30 | 0.67 |
| Fluorene               | mg/kg | 0.05 | MCERTS | < 0.05 | 0.54 | 0.47 |
| Phenanthrene           | mg/kg | 0.05 | MCERTS | 1.8    | 5.7  | 6.2  |
| Anthracene             | mg/kg | 0.05 | MCERTS | 0.42   | 2.1  | 2.0  |
| Fluoranthene           | mg/kg | 0.05 | MCERTS | 3.0    | 11   | 13   |
| Pyrene                 | mg/kg | 0.05 | MCERTS | 2.7    | 9.6  | 12   |
| Benzo(a)anthracene     | mg/kg | 0.05 | MCERTS | 1.7    | 6.8  | 7.6  |
| Chrysene               | mg/kg | 0.05 | MCERTS | 1.7    | 5.4  | 5.2  |
| Benzo(b)fluoranthene   | mg/kg | 0.05 | MCERTS | 1.8    | 8.6  | 7.6  |
| Benzo(k)fluoranthene   | mg/kg | 0.05 | MCERTS | 0.90   | 2.3  | 2.0  |
| Benzo(a)pyrene         | mg/kg | 0.05 | MCERTS | 1.6    | 6.5  | 5.9  |
| Indeno(1,2,3-cd)pyrene | mg/kg | 0.05 | MCERTS | 0.78   | 3.4  | 3.1  |
| Dibenz(a,h)anthracene  | mg/kg | 0.05 | MCERTS | 0.27   | 1.1  | 0.90 |
| Benzo(ghi)perylene     | mg/kg | 0.05 | MCERTS | 0.94   | 3.8  | 3.3  |

#### Total PAH

|                             |       |     |        |      |      |      |
|-----------------------------|-------|-----|--------|------|------|------|
| Speciated Total EPA-16 PAHs | mg/kg | 0.8 | MCERTS | 17.5 | 67.4 | 70.2 |
|-----------------------------|-------|-----|--------|------|------|------|

Analytical Report Number: 21-25698

Project / Site name: 91 Kingswood Road Withington

Your Order No: 2211128

|                                         |       |                    |                      |               |               |               |
|-----------------------------------------|-------|--------------------|----------------------|---------------|---------------|---------------|
| Lab Sample Number                       |       |                    |                      | 2097783       | 2097784       | 2097785       |
| Sample Reference                        |       |                    |                      | WS1           | WS2           | WS3           |
| Sample Number                           |       |                    |                      | C1            | C1            | C1            |
| Depth (m)                               |       |                    |                      | 0.20          | 0.20          | 0.20          |
| Date Sampled                            |       |                    |                      | 24/11/2021    | 24/11/2021    | 24/11/2021    |
| Time Taken                              |       |                    |                      | None Supplied | None Supplied | None Supplied |
| Analytical Parameter<br>(Soil Analysis) | Units | Limit of detection | Accreditation Status |               |               |               |
|                                         |       |                    |                      |               |               |               |
| Heavy Metals / Metalloids               |       |                    |                      |               |               |               |
| Arsenic (aqua regia extractable)        | mg/kg | 1                  | MCERTS               | 16            | 19            | 21            |
| Barium (aqua regia extractable)         | mg/kg | 1                  | MCERTS               | 190           | 150           | 460           |
| Beryllium (aqua regia extractable)      | mg/kg | 0.06               | MCERTS               | 1.2           | 0.85          | 1.3           |
| Boron (water soluble)                   | mg/kg | 0.2                | MCERTS               | 1.0           | 0.3           | 0.6           |
| Cadmium (aqua regia extractable)        | mg/kg | 0.2                | MCERTS               | 0.8           | < 0.2         | 3.8           |
| Chromium (hexavalent)                   | mg/kg | 1.2                | MCERTS               | 3.7           | < 1.2         | 2.4           |
| Chromium (aqua regia extractable)       | mg/kg | 1                  | MCERTS               | 27            | 34            | 36            |
| Copper (aqua regia extractable)         | mg/kg | 1                  | MCERTS               | 54            | 200           | 130           |
| Lead (aqua regia extractable)           | mg/kg | 1                  | MCERTS               | 120           | 380           | 210           |
| Mercury (aqua regia extractable)        | mg/kg | 0.3                | MCERTS               | 0.6           | < 0.3         | < 0.3         |
| Nickel (aqua regia extractable)         | mg/kg | 1                  | MCERTS               | 20            | 28            | 22            |
| Selenium (aqua regia extractable)       | mg/kg | 1                  | MCERTS               | < 1.0         | < 1.0         | < 1.0         |
| Vanadium (aqua regia extractable)       | mg/kg | 1                  | MCERTS               | 36            | 51            | 38            |
| Zinc (aqua regia extractable)           | mg/kg | 1                  | MCERTS               | 110           | 240           | 280           |

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



**Analytical Report Number : 21-25698**

**Project / Site name: 91 Kingswood Road Withington**

\* 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 *                           |
|-------------------|------------------|---------------|-----------|------------------------------------------------|
| 2097783           | WS1              | C1            | 0.2       | Brown loam and clay with vegetation and gravel |
| 2097784           | WS2              | C1            | 0.2       | Brown loam and clay with vegetation and gravel |
| 2097785           | WS3              | C1            | 0.2       | Brown loam and clay with vegetation and gravel |

**Analytical Report Number : 21-25698**  
**Project / Site name: 91 Kingswood Road Withington**

**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               |
| Asbestos identification in soil           | Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.                                                           | In house method based on HSG 248                                                                                | A001-PL       | D                  | ISO 17025            |
| Boron, water soluble, in soil             | Determination of water soluble boron in soil by hot water extract followed by ICP-OES.                                                                                          | In-house method based on Second Site Properties version 3                                                       | L038-PL       | D                  | MCERTS               |
| Hexavalent chromium in soil (Lower Level) | Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.                           | In-house method                                                                                                 | L080-PL       | W                  | MCERTS               |
| 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 (Skalar) | L080-PL       | W                  | MCERTS               |
| Moisture Content                          | Moisture content, determined gravimetrically. (30 oC)                                                                                                                           | In house method.                                                                                                | L019-UK/PL    | W                  | NONE                 |
| Monohydric phenols in soil                | Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.                                                          | In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar) | L080-PL       | W                  | MCERTS               |
| 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                  | 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               |
| 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               |
| Thiocyanate in soil                       | Determination of thiocyanate in soil by extraction in water followed by acidification followed by addition of ferric nitrate followed by discrete analyser (spectrophotometer). | In-house method                                                                                                 | L082-PL       | D                  | NONE                 |
| Stones content of soil                    | Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.                                                     | In-house method based on British Standard Methods and MCERTS requirements.                                      | L019-UK/PL    | D                  | NONE                 |
| Total cyanide in soil                     | Determination of total cyanide by distillation followed by colorimetry.                                                                                                         | In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar) | L080-PL       | W                  | MCERTS               |
| Total Sulphate in soil as %               | Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.                                                                                         | In house method.                                                                                                | L038-PL       | D                  | MCERTS               |
| Total Sulphur in soil as %                | Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.                                                            | In house method.                                                                                                | L038-PL       | D                  | MCERTS               |

**For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.**

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

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



**Analytical Report Number : 21-25698**  
**Project / Site name: 91 Kingswood Road Withington**

**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 |
|----------------------|-------------------------------|-----------------------------|---------------|--------------------|----------------------|
|----------------------|-------------------------------|-----------------------------|---------------|--------------------|----------------------|

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.

# Soils Risk Assessment

Site Reference: 6083 VKW  
 Project Site: 91 Kingswood Road  
 Project Location: Withington, Manchester  
 Client: Mr I Butt

| I2 Reference                                                                                                                     | #N/A         | TP1-C1                           | TP2-C1       | TP3-C1       | - |
|----------------------------------------------------------------------------------------------------------------------------------|--------------|----------------------------------|--------------|--------------|---|
| Customer Sample Ref:                                                                                                             | C4SL / S4UL  | 0.3                              | 0.3          | 0.3          | - |
|                                                                                                                                  | SOM 1% GAC   | 04/05/2021                       | 04/05/2021   | 04/05/2021   | - |
| Determinand                                                                                                                      | LQM II       |                                  |              |              |   |
| Arsenic                                                                                                                          | 27           | 16                               | 19           | 21           | - |
| Boron (water-soluble)                                                                                                            | 290          | 1                                | 0.3          | 0.6          | - |
| Cadmium                                                                                                                          | 22           | 0.8                              | 0.2          | 3.8          | - |
| Chromium*                                                                                                                        | 910          | 27                               | 34           | 36           | - |
| Chromium VI                                                                                                                      | 21           | 3.7                              | 1.2          | 2.4          | - |
| Copper                                                                                                                           | 2400         | 54                               | 200          | 130          | - |
| Cyanide(Total)                                                                                                                   | -            | 1                                | 1            | 1            | - |
| Cyanide(free)**                                                                                                                  | 34           | 1                                | 1            | 1            | - |
| Lead                                                                                                                             | 200          | 120                              | 380          | 210          | - |
| Mercury                                                                                                                          | 1.2          | 0.6                              | 0.3          | 0.3          | - |
| Nickel                                                                                                                           | 130          | 20                               | 28           | 22           | - |
| pH                                                                                                                               | -            | 7                                | 7.9          | 7.5          | - |
| Phenols(Mono)                                                                                                                    | 1100         | 1                                | 1            | 1            | - |
| Selenium                                                                                                                         | 250          | 1                                | 1            | 1            | - |
| SO4(Total)                                                                                                                       | -            | 0.048                            | 0.063        | 0.066        | - |
| Sulphide                                                                                                                         | -            | 1                                | 14           | 1            | - |
| Sulphur(Free)                                                                                                                    | -            | 0.039                            | 0.062        | 0.045        | - |
| Thiocyanate                                                                                                                      | -            | 5                                | 5            | 5            | - |
| Zinc                                                                                                                             | 3700         | 110                              | 240          | 280          | - |
| Acenaphthene                                                                                                                     | 1100         | 0.05                             | 0.3          | 0.67         | - |
| Acenaphthylene                                                                                                                   | 920          | 0.05                             | 0.51         | 0.22         | - |
| Anthracene                                                                                                                       | 11000        | 0.42                             | 2.1          | 2            | - |
| Benzo(a)Anthracene                                                                                                               | -            | 1.7                              | 6.8          | 7.6          | - |
| Benzo(a)Pyrene SM                                                                                                                | 5            | 1.6                              | 6.5          | 5.9          | - |
| Benzo(b)Fluoranthene                                                                                                             | -            | 1.8                              | 8.6          | 7.6          | - |
| Benzo(ghi)Perylene                                                                                                               | -            | 0.94                             | 3.8          | 3.3          | - |
| Benzo(k)Fluoranthene                                                                                                             | -            | 0.9                              | 2.3          | 2            | - |
| Chrysene                                                                                                                         | -            | 1.7                              | 5.4          | 5.2          | - |
| Dibenzo(ah)Anthracene                                                                                                            | -            | 0.27                             | 1.1          | 0.9          | - |
| Fluoranthene                                                                                                                     | 890          | 3                                | 11           | 13           | - |
| Fluorene                                                                                                                         | 860          | 0.05                             | 0.54         | 0.47         | - |
| Indeno(123-cd)Pyrene                                                                                                             | -            | 0.78                             | 3.4          | 3.1          | - |
| Naphthalene                                                                                                                      | 13           | 0.05                             | 0.2          | 0.23         | - |
| Phenanthrene                                                                                                                     | 440          | 1.8                              | 5.7          | 6.2          | - |
| Pyrene                                                                                                                           | 2000         | 2.7                              | 9.6          | 12           | - |
| PAH(total)                                                                                                                       | 500          | 17.5                             | 67.4         | 70.2         | - |
| Asbestos                                                                                                                         | Not-detected | Not-detected                     | Not-detected | Not-detected | - |
| All Units mg/kg unless otherwise stated                                                                                          |              |                                  |              |              |   |
| Indicates Exceedance of Applicable Level                                                                                         |              |                                  |              |              |   |
| *Criteria Assumes Chromium III                                                                                                   |              |                                  |              |              |   |
| **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 entirely of a 50:50 Aliphatic and Aromatic Split C8-C10 range |              |                                  |              |              |   |
| Basis of Assessment Criteria:                                                                                                    |              | EA 2005 WAC (Human Health Value) |              | C4SL         |   |
|                                                                                                                                  |              | LQM S4UL                         |              | Atrisk 06    |   |