

Residential Development at Land To Rear of 18 Kingsley Avenue

Phase I Desk Study Report

March 2023



Land to Rear of 18 Kingsley Avenue
Phase I Desk Study Report

RB Geotechnical

Document Control

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APPENDIX CONTENTS

Appendix A	GroundSure Groundsure Report
Appendix B	Historical Ordnance Survey Maps

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Disclaimer

This report was produced by **RB Geotechnical** for Mr Ali (The client) for the specific purposes of a Phase I Desk Study for the proposed residential development on the land to the rear of 18 Kingsley Avenue in Huddersfield, West Yorkshire. This report may not be used by anyone else other than the client without their express permission. In any event, **RB Geotechnical** accepts no liability for any costs, liabilities or losses arising from the use of reliance upon the contents of this report by anyone other than the client.

1.0 Introduction

RB Geotechnical was commissioned by the client to carry out a Phase I Desk Study for the proposed residential development on the land to the rear of 18 Kingsley Avenue in Huddersfield, West Yorkshire.

1.1 Aims and Scope

The principal aims of this Phase I Desk Study is to interpret information pertaining to the site, obtained during a desk-based review of available data and recent photos of the site.

The scope of this study is as follows:

- To provide general information on the site such as location and description;
- To discuss the geology, hydrogeology, and hydrology at, and in the vicinity of, the site;
- To summarise the environmental setting of the site; e.g. landfills, permits and sensitive land uses;
- To summarise potential geotechnical risks associated with the site;
- To provide a preliminary summary of potential coal mining risks to the site;
- To discuss and summarise any historical development that have occurred at the site and in the surrounding area;
- To assess potential contamination issues pertaining to the site with consideration of the site's historic use;
- To develop an initial conceptual model linking sources of potential contamination with pathways and receptors; and
- To provide a preliminary risk assessment for the current and proposed end use of the site.

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Please note that this Phase I Desk Study excludes an assessment of risks arising from asbestos, unexploded ordnance, and/or invasive species.

1.2 Terms and Conditions

This report has been prepared for the client to help support a planning application for the proposed residential development at the land to the rear of 18 Kingsley Avenue in Huddersfield, West Yorkshire.

1.3 Sources of information

Information on the site layout and current land use of the site is mainly based on information collected from online sources and photos from other sources.

An environmental database search was undertaken by GroundSure to provide supplementary Environmental information for the site and surrounding area. This was collated into an Insight Report by Ground Sure and as such the potential for further data to exist cannot be ruled out.

The existing database and other sources of which this study is based comprise:

- GroundSure Report, Kingsley Avenue, 10th March 2023 – Appendix A
- GroundSure 1:10,000 Historical Maps, Kingsley Avenue, 10th March 2023 - Appendix B
- GroundSure 1:2,500 Historical Maps, Kingsley Avenue, 10th March 2023 - Appendix B
- Environment Agency website (www.environment-agency.gov.uk);
- British Geological Survey (BGS) Geindex website (www.bgs.ac.uk/geoindex)
- Coal Authority Interactive Viewer (www.mapapps2.bgs.ac.uk/coalauthority/home.html)

Although every effort has been made to ensure the accuracy of the information contained herein, no checks have been carried out to ensure the accuracy of information obtained from third parties and no liability can be accepted for any errors or misinterpretation of the third-party information where it has been incorporated into this report.

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2.0 Site Details

2.1 Site Location and Description

The 1.02ha sized site is situated at a plot of undeveloped land located to the North of 18 Kingsley Avenue in Huddersfield, West Yorkshire. The site currently consists a raised area of rough grass and mature trees, with a public footpath running through it. Three terraced houses occupy the far South Eastern corner of the site with the rest of it being completely undeveloped.

The National Grid Reference for the centre of the site is 413201, 415664.

2.2 Proposed Development

A number of new residential properties are to be constructed on the land to the rear of 18 Kingsley Avenue in Huddersfield, West Yorkshire.

3.0 Site History

3.1 History of site and surrounding area

Information relating to the historical development of the site and the surrounding area has been obtained from Historical Ordnance Survey Maps (1:10,000 and 1:2,500). These are presented in Appendix B.

Table 3.1 Summary of on-site and surrounding area history

Map	On-Site Features	Surrounding Area
1854	The irregular shaped site is shown to be an undeveloped parcel of land set within open fields.	A railway line is shown running adjacent to the Eastern site boundary within a cutting, with the majority of the surrounding area occupied by open fields. The main town centre of Huddersfield is shown from approximately 300m to the North of the site.
1854 - 1891	The site remain unchanged	Development of a number of residential streets is apparent from approximately 100m to the North East of the site.
1891 - 1905	The site remains undeveloped, however a tunnel is mapped along the Eastern extent, running in a North to South direction.	Further development of both residential and industrial buildings is present across the surrounding area.
1905 -	The site remains unchanged, however	Largescale residential development has taken place from

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Map	On-Site Features	Surrounding Area
1918	it is noted as being within Crosland Moor Bottom Recreation Ground.	adjacent to the West of the site, with numerous new rows of houses and streets.
1918 – 1932	The site remains unchanged.	A large mill building is shown from approximately 80m to the North of the site. The rest of the surrounding area remains largely unchanged.
1932 – 1948	The site remains largely unchanged, apart from three small houses now present in the far South East corner.	Kingsley Avenue is now shown with houses adjacent to the Southern site boundary. Further residential development in all directions.
1948 – 1960	The site is shown to have been split into different zones, with a few small rectangular buildings.	The surrounding area remains unchanged.
1960 – present day	No buildings exist on the site anymore	The surrounding area remains largely unchanged.

4.0 Geology, Hydrogeology and Hydrology

4.1 Geology

Information relating to the geology of the site has primarily been sourced from the GroundSure Report and the BGS Geotindex website.

4.1.1 Made Ground

According to the published geological maps and information on the BGS GeoIndex website, Made Ground is mapped adjacent to the North Eastern site boundary, which is associated with the railway line and the tunnel that runs through that section of the site.

4.1.2 Superficial Deposits

No superficial deposits are mapped beneath the site.

4.1.3 Solid Geology

Geological maps indicate that the majority of the site is underlain by bedrock of the Pennine Lower Coal Measures Siltstone and Sandstone, with only a small section in the South Eastern corner underlain by Soft Bed Flags Sandstone.

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4.1.4 BGS Boreholes

No nearby historical BGS boreholes are mapped close to the site.

4.1.5 Faults and Seams

No faults or coal seams are mapped within 250m of the site boundary.

4.1.6 Radon

The GroundSure Report indicates that the site is within a Radon Affected Area, as between 3% and 5% of properties are affected and therefore Basic Radon Protection Measured are required.

4.2 Hydrogeology

4.2.1 Aquifers

The underlying superficial deposits are classified as being a Secondary A Aquifer which is one that can be described as having Permeable Layers which are capable of supporting water supplies at a local rather than strategic scale.

4.2.2 Groundwater, Surface Water and Potable Water Abstraction Licences

The GroundSure Report indicates that there are no Groundwater, Surface Water or Potable Water Abstraction Licences within 250m of the site boundary.

4.2.3 Discharge Consents

There are 36 Recorded Licensed Discharges within 500m of the site boundary, the nearest being 187m to the North as Sewage Discharge.

4.2.4 Pollution Incidents to Controlled Waters

The Groundsure Report shows no significant pollution incidents to controlled water within 250m of the site boundary.

4.3 Hydrology

No water networks are mapped within 250m of the site boundary.

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4.3.1 Flood Risk

The GroundSure Report states that the site is at a **Very Low** Risk of flooding from Rivers and Sea and is not situated within either a Zone 2 Fluvial/Tidal Model or Zone 3 Fluvial Model floodplain. The site is classified as having a **Negligible** risk of Groundwater and Surface Water flooding.

4.3.2 Source Protection Zones

There are no source protection zones mapped within 500m of the site boundary.

5.0 Environmental Setting

5.1 Waste Treatment and Disposal

5.1.1 Landfill Sites

There are no active/recent landfill sites mapped within 250m of the site boundary.

5.1.2 Waste Management, Waste Treatment, Waste Transfer Facilities or Disposal Sites

There are no licensed waste site is mapped within 250m of the site boundary.

5.2 Regulatory Permits, Incidents and Registers

5.2.1 Control of Major Hazard Sites /Notification of Installations Handling Substances

The GroundSure Report indicates that the site is not within 500m of a Control of Major Hazard site (COMAH) or Notification of Installations Handling Substances (NIHHS).

5.2.2 Planning Hazardous Substance Consents

There are no records of Planning Hazardous Substance Consents within 500m of the site.

5.2.3 Recorded Pollution Incidents

There is one recorded pollution incident mapped within 250m of the site boundary, located 11m to the North of the site with the pollutant described as smoke. It had a Category 3 Minor Air Impact.

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5.3 Potentially Infilled Land

The Groundsure Report indicates that there are no areas of potentially infilled land within 250m of the site boundary, however worked ground is mapped beneath the site and from 96m to the South East of the site.

5.4 Sensitive Land Uses

A local nature reserve is mapped 676m to the North of the site at Gledholt Woods, Green Belt Land is mapped 666m to the South of the site and the site itself is within an SSSI impact risk zone. No other classified sensitive land uses are mapped either on or within 1000m of the site.

6.0 Potentially Contaminative Sites

6.1 Potentially Contaminative Land Uses

Potentially contaminative historic land uses within 250m of the site boundary have been identified as the historic mill that is mapped adjacent to the North of the site, the tunnel beneath the site and the railway cuttings/railway line mapped adjacent to the site. Others include unspecified works buildings, railway sidings and other railway associated works. just as the old quarry. Current potentially contaminative land uses mapped within 250m of the site boundary have been identified as an Electricity Sub Station situated 57m to the South West of the site and 84m to the North East of the site. Others include a range of other works types buildings all located within 250m of the site boundary.

7.0 Geotechnical Assessment

7.1 Natural Hazards

The GroundSure Report states that the site has a **Negligible** risk of Compressible Deposits, Running Sands and Ground Dissolution of Soluble Rocks, a **Very Low** risk of Collapsible Deposits and Shrink Swell Clays and a **Low** risk of Landslides.

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8.0 Mining

The site is noted by the Groundsure Report as not being within a Coal Mining Area, however upon inspecting the Coal Authority Interactive Viewer, it is evident that the site is not classified as being in a 'Development High Risk Area'.

It is however within a Non-Coal Mining Area, with the Vein Material seen as the commodity.

9.0 Conceptual Site Model

9.1 Introduction

A preliminary **Conceptual Site Model** (CSM) has been developed for the site, to assess any constraints on the proposed development arising from contamination which may be present. The CSM describes the relationship between contamination which may be present from past and current activities, both on and off site, along with potential receptors of that contamination.

The site has been assessed in line with current UK guidelines, namely the Contaminated Land (England) Regulations 2000 and Part IIA of the Environmental Protection Act 1990 and follows the procedures set out in the Environmental Agency 'Model Procedures for the Management of Land Contamination – Contamination Land Report (CLR).11'.

CLR.11 provides the technical framework for structured decision making about land contamination and builds on previous work carried out under the Contaminated Land Research Programme of the former Department of the Environment. CLR 11 has adopted and refined the methodology and terminology that has been used in contaminated land risk assessment for a number of years.

CLR.11 defines the three essential elements to any risk:

- **A contaminant source** - a substance that is in, on or under land and has the potential to cause harm or to cause pollution of controlled waters;
- **A receptor** – in general terms, something that could be adversely affected by a contaminant, such as people, an ecological system, property, or a water body; and

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- **A pathway** - a route or means by which a receptor can be exposed to or affected by a contaminant.

Each of these elements can exist independently, but they create a risk only where they are linked together, so that a particular contaminant affects a particular receptor through a particular pathway. This kind of linked combination of source-pathway-receptor is described as a **Potential Pollutant Linkage (PPL)**.

It should be noted that at this preliminary stage, the assessment is based only on a desk-based study. A quantitative assessment of the potential risk is not possible at this stage of the assessment.

This report presents a Preliminary Conceptual Site Model and Preliminary Risk Assessments for the site, based on the proposed **Residential** end use.

9.2 Potential Contamination Sources

9.2.1 On Site Sources

Potential on-site sources of contamination have been identified as possible Made Ground associated with the excavation of the tunnel and railway cuttings located adjacent to the Eastern site boundary.

9.2.2 Off Site Sources

Potential off-site sources of contamination have been identified as possible ground gases from ground workings.

9.3 Potential Receptors

9.3.1 Human Receptors

Based on the proposed use of the site, on-site receptors include:

- New Residents;
- Construction workers involved in the proposed development. Note that potential contamination risks to construction workers will be mitigated by appropriate risk assessments and mitigation measures required by Control of Substances Hazardous to Health (COSHH) and Construction, Design and Management (CDM) regulations.

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9.3.2 Controlled Waters Receptors

The following on-site controlled waters receptors include:

- Groundwater within the underlying Aquifers.

9.3.3 Buildings Receptors

The proposed new buildings are a potential receptor.

9.4 Potential Pathways

9.4.1 On-Site Human Receptors

Potential pathways to future human receptors on site include:

- Dermal contact or ingestion with contaminated soils;
- Inhalation of contaminants in soil derived dust;
- Migration and inhalation of gases and vapours outdoors or indoors;
- Contamination of drinking water pipes by contaminated soils/water leading to the ingestion of contaminated drinking water.

9.4.2 Controlled Waters

Potential pathways to on-site controlled water receptors (groundwater) include:

- Leaching of contaminants and/or migration of contaminants from the unsaturated zone of soils to groundwater (Secondary B Aquifer) in natural strata;
- Vertical migration of contaminants in shallow groundwater to deeper strata and aquifers;
- Lateral migration of impacted water through service conduits, drainage systems and possible perched groundwater pathways to surface water receptors.

9.4.3 Buildings

Potential pathways from off-site sources to the on-site property receptor include:

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- Migration and accumulation of ground gas or vapours in buildings or structures.

9.5 Preliminary Risk Assessment

Based on the stated potential sources of contaminants identified and the receptors and pathways described, an assessment of the environmental risks has been made with reference to the significance and degree of risk. This assessment is based on consideration of whether the source contamination can reach a receptor and hence whether it is of a major or minor significance.

A preliminary Conceptual Site Model (CSM) of the Potential Pollutant Linkages (PPL) has been developed based on the information derived from this desk study for the site. This CSM has been used to identify potentially Relevant PPL's for the current and proposed end uses which have been assessed qualitatively using CIRIA 552 guidance, as described in Table 9.1 and Table 9.2.

Table 9.1 Classification of Consequence

Consequence	Criteria
Severe	Short term (acute) risk to Human Health likely to result in "significant harm" as defined by the Environmental Protection Act 1990, Part IIa. Short term risk of pollution of sensitive water resource. Catastrophic damage to buildings / property
Moderate	Chronic damage to Human Health likely, over a long term, to result in "significant harm" as defined by the Environmental Protection Act 1990, Part IIa. Pollution of sensitive water resources
Mild	Health effects to Human Health that are unlikely to result in "significant harm" as defined by the Environmental Protection Act 1990, Part IIa. Pollution of non-sensitive water resources. Significant damage to crops, buildings, structures, and services. Damage to sensitive buildings / structures / services or the environment
Negligible	Non-permanent health effects to Human Health that are unlikely to result in "significant harm" as defined by the Environmental Protection Act 1990, Part IIa. Those that are easily prevented by means such as personal protective clothing. Harm, although not necessarily significant harm, which may result in a financial loss, or expenditure to resolve.

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Table 9.2 Classification of Probability

Probability	Criteria
Almost Certain	Circumstances are such that an event either appears very likely in the short term and almost inevitable over the long term or there is evidence of currently harm occurring
Likely	Circumstances are such that an event, whilst not inevitable, is possible in the short term and is likely to occur over the long term
Unlikely	Circumstances are such that it is possible an event could occur, but it is by no means certain to occur even over a longer period, and it is less likely in the shorter term
Very Unlikely	Pollutant linkage may be present, but the circumstances under which harm would occur are improbable even in the medium to long term
Extremely Unlikely	Pollutant linkage may be present, but the circumstances under which harm would occur are highly improbable even in the long term

Once the consequence and probability have been classified, these can then be compared to produce a risk category (using Table 8.3), ranging from **Very High Risk** to **Very Low Risk**, with the definitions summarised in Table 9.4.

Table 9.3 Comparison of Consequence against Probability

Consequence Probability	Severe	Moderate	Mild	Negligible
Almost Certain	Very High Risk	High Risk	Moderate Risk	Low Risk
Likely	High Risk	Moderate Risk	Moderate/ Low Risk	Low Risk
Unlikely	Moderate Risk	Moderate/ Low Risk	Low Risk	Very Low Risk
Very Unlikely	Low Risk	Low Risk	Very Low Risk	Very Low Risk
Extremely Unlikely	Very Low Risk	Very Low Risk	Very Low Risk	Very Low Risk

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Table 9.4 Description of the Classified Risks and Likely Action Required

Risk	Criteria
Very High	There is a high probability that severe harm could arise to a designated receptor from an identified hazard at the site without appropriate remediation action
High	Harm is likely to arise to a designated receptor from an identified hazard at the site without appropriate remediation action.
Moderate	It is possible that without appropriate remediation action, harm could arise to a designated receptor. It is relatively unlikely that any such harm would be severe, and if any harm were to occur it is more likely that such harm would be relatively mild
Low	It is possible that harm could arise to a designated receptor from an identified hazard. It is likely that, at works, if any harm were to be realised, any such effects would be mild.
Very Low	There is very low possibility that harm could arise to the receptor, but it is likely that this harm, if realised, would be mild at worst

In accordance with CLR11, professional judgement has been employed to evaluate the risk on a qualitative basis using available information.

A summary of the pollution linkages identified during the desk study are provided in Table 9.5.

Table 9.5 Conceptual Site Model of Potential Pollutant Linkages

Source	Receptor	Pathway	Risk
Contaminants in soil, soil derived dust, surface water run-off, groundwater, and as vapours/ground gas	New Residents	<ul style="list-style-type: none"> • Dermal contact or ingestion contaminants in soil-derived dust and entrained surface water run-off from areas where soil is exposed at the surface or where excavation takes place and in shallow groundwater in the natural strata if excavation takes place below the water table. • Inhalation of contaminants in soil derived dust from areas where soil is exposed at the surface of where excavation takes place. • Inhalation of soil and water derived vapours and ground gas outdoors • Inhalation of soil derived, and water derived vapours and ground gas indoors where it may have accumulated in buildings and enclosed spaces. 	Moderate/Low
	Construction Workers	<ul style="list-style-type: none"> • Dermal contact or ingestion contaminants in soil-derived dust and entrained surface water run-off from areas where soil is exposed at the surface or where excavation takes place and in shallow groundwater in the natural strata if excavation takes place below the water table. • Inhalation of contaminants in soil derived dust from areas where soil is exposed at the surface of where excavation takes place. 	Low
Contaminants in Soil	Groundwater within the underlying soils and bedrock (Secondary A Aquifer)	<ul style="list-style-type: none"> • Leaching of contaminants and/or migration of free phase contaminants from the unsaturated zone soils to groundwater in the natural strata • Vertical migration of contaminants in shallow groundwater to deeper strata and aquifer 	Low
Contaminants in soil, surface water runoff, groundwater and as vapours/ground gas	Surface Water	<ul style="list-style-type: none"> • Lateral migration of contaminants and/or migration of free phase contaminants present in the Made Ground via groundwater to surface water discharge • Lateral migration of contaminants and/or migration of free phase contaminants present in the Made Ground and entrained in surface water runoff 	Low
Contaminants in soil, groundwater and as vapours/ground gas	Building	<ul style="list-style-type: none"> • Accumulation of soil and water derived vapours/and or ground gas in enclosed spaces 	Moderate/Low

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10.0 Conclusions

Residential development is proposed on the Land to the Rear of 18 Kingsley Avenue in Huddersfield, West Yorkshire, which will include driveways and private back gardens.

Potential on-site sources of contamination have been identified as possible Made Ground across the site related to the construction of the railway tunnel and railway cuttings.

Off-site sources of contamination have been identified as possible ground gases resulting from the worked ground in the close surrounding area.

In summary, on the basis of the above listed contaminant sources it is concluded that:

- Contaminants are likely to be present in, on or under the land at the site from on-site and off-site sources; and
- Future on site receptors to any form of contamination have been identified as the construction workers, residents, employees, the new buildings, surface water and the groundwater.

A qualitative risk assessment of the identified potential pathways of contamination to the site have been summarised in Table 9.5. The following risks have been designated:

- Future Human Receptors –Moderate/Low Risk
- Construction Workers –Low Risk
- Groundwater –Low Risk
- Surface Water –Low Risk
- New Buildings – Moderate/Low Risk

Based on the review of all available historical data, it has been established that overall a **MODERATE/LOW** risk of potential pollutant linkage to the site exists. This risk has been identified due to the potential for Made Ground beneath the site and for possible ground gases from off-site sources.

11.0 Recommendations

It is recommended that a Phase II Intrusive Investigation is carried out across the site to allow for an assessment of the shallow soils for both soil contamination purposes and for geotechnical parameters.

This ground investigation should also allow for a detailed ground gas assessment.

References

- BS 5930: (2015) Code of Practice for Site Investigations. British Standards Institution.
- BS 10175: (2011) Code of Practice for the Investigation of Potentially Contaminated Sites. British Standard Institution.
- CIRIA 552: (2001) Contaminated Land Risk Assessment, A guide to good practice.