

Old Shoulder Of Mutton

Phase I Desk Study Report

July 2024



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Old Shoulder of Mutton
Phase I Desk Study Report

Document Control

Project: Old Shoulder of Mutton, Phase I Desk Study Report

Client: TMU Property Ltd

Job Number: RBG271

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Issue	Date	Status
001	July 2024	Final

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APPENDIX CONTENTS

Appendix A	EnviroInsight Groundsure Report
Appendix B	Historical Ordnance Survey Maps
Appendix C	Proposed Development Plans

Disclaimer

This report was produced by **RB Geotechnical** for TMU Property Ltd (The client) for the specific purpose of a Phase I Desk Study for the proposed residential redevelopment of the former Old Shoulder of Mutton Pub in Batley, 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 redevelopment at the Old Shoulder of Mutton Pub in Batley, 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 for 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.

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 in support of a proposed planning application for the proposed residential redevelopment at the former Old Shoulder of Mutton Pub in Batley, 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 EnviroInsight Report, Old Should of Mutton, 21st January 2022 - Appendix A
- GroundSure 1:10,000 and 1:2,500 Historical Maps, Old Shoulder of Mutton, 21st January 2022 - Appendix B
- Environment Agency website (www.environment-agency.gov.uk);
- British Geological Survey (BGS) Geoindex 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.

2.0 Site Details

2.1 Site Location and Description

The 0.10ha sized site, is situated off Upper Road in Batley, West Yorkshire. It is currently occupied by a large two storey sandstone block built ‘now derelict’ pub building. The land to the East of the main pub building is tarmac car parking. Some old small brick-built garages are located in the North East corner of the site. The National Grid Reference for the centre of the site is 423708, 422859.

2.2 Proposed Development

The proposed development is to comprise redevelopment of the current Old Shoulder of Mutton Pub building into a new residential property, with the addition of two storey flats to the East of the main building. The North of the site will be used as private amenity space, with soft landscaped gardens. The proposed development plan is shown in Appendix C.

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
1855 – 1894	The site is shown to be occupied by a pub called ‘Old Shoulder Of Mutton’. The pub building is rectangular and located in the centre of the site. The area of the site surrounding the main building is undeveloped. A small garage or outhouse type building is shown in the North east of the site. A small building also exists in the South East corner of the site.	The surrounding area adjacent to the East and North of the site is occupied by Mills and Mill Ponds, with the area to the North shown as large gardens. The rest of the surrounding area is mainly houses. A road runs along the Southern site boundary and the Western site boundary. A quarry is shown from approximately 100m to the North West, which by the 1890s is no longer present and has houses upon it.
1894 – 1905	The small outhouse type building in the North East of the site has doubled in size.	New rows of terraced houses have been constructed from approximately 90m to the South of the site.

Map	On-Site Features	Surrounding Area
1905 – 1938	The site remains unchanged.	The surrounding area remains largely unchanged.
1938 – 1955	The small outhouse type building in the North East corner has now extended further in size. The small building in the South East corner of the site is now labelled as an Electricity Sub-Station.	The surrounding area remains largely unchanged.
1955 - 1969	The small outhouse buildings are now shown to have been demolished.	The land to the North has had widescale residential development.
1969 – 1971	The site remains unchanged.	The surrounding area remains unchanged.
1971 – 1985	A new square building is shown in the North of the site.	The Mills once located adjacent to the North and East of the site are no longer present and instead new houses have been constructed.
1985 – present day	The site remains unchanged.	The surrounding area remains unchanged.

4.0 Geology, Hydrogeology and Hydrology

4.1 Geology

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

4.1.1 Made Ground

According to the published geological maps and information on the BGS GeoIndex website, no Made Ground is situated on the site itself.

4.1.2 Superficial Deposits

No superficial deposits are mapped beneath the site.

4.1.3 Solid Geology

Geological maps indicate that the site is underlain by bedrock of the Pennine Lower Coal Measures, Mudstone, Siltstone and Sandstone.

No BGS boreholes are situated within 250m of the site.

4.1.4 Faults and Seams

A Coal Seam is mapped from approximately 168m to the East of the site, trending in a North to South direction. The nearest fault is located 207m to the South West.

4.1.5 Radon

The EnviroInsight Report indicates that the property is not located within a Radon Affected Area, as less than 1% of properties are affected. No Radon Protection Measures are deemed necessary.

4.2 Hydrogeology

4.2.1 Aquifers

The underlying bedrock is classified as being a Secondary A Aquifer, with Permeable Layers Capable of Supporting water supplies at a local, rather than strategic scale.

4.2.2 Groundwater, Surface Water and Potable Water Abstraction Licences

The EnviroInsight Report indicates that there are no Groundwater, Surface Water or Potable Water Abstractions located within 500m of the site boundary.

4.2.3 Discharge Consents

There are four recorded licensed discharges within 500m of the site boundary, these are situated 30m to the South East and 59m to the South, all as Sewage Storm Overflows.

4.2.4 Pollution Incidents to Controlled Waters

The EnviroInsight Report shows no significant pollutions within 250m of the site.

4.3 Hydrology

There are no water networks or surface water features within 250m of the site boundary.

4.3.1 Flood Risk

The EnviroInsight Report states that the site is at Low flood risk from rivers and sea. The site is not situated within a Zone 2 Fluvial/Tidal Model or Zone 3 Fluvial Model floodplain and is at a Negligible Risk of Surface Water Flooding. The site is at Negligible Risk of Groundwater Flooding.

4.3.2 Source Protection Zones

There are no Source Protection Zones 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 or historic landfills situated within 250m of the site boundary.

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

There are no Licensed Waste Site located within 250m of the site boundary. A historical waste site is located 188m to the East of the site at former ground workings.

5.2 Regulatory Permits, Incidents and Registers

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

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

5.2.2 Planning Hazardous Substance Consents

There are no recorded hazardous substance storages situated within 250m of the site boundary.

5.3 Potentially Infilled Land

A number of infilled land features are mapped within 250m of the site, identified as infilled ground from 103m to the North in the area of the old quarry and worked made ground from 153m to the South. A number of others are also mapped within 250m of the site boundary, including old mill ponds.

5.4 Sensitive Land Uses

Green Belt Land is mapped 918m to the East of the site, a Nitrate Vulnerable Zone is mapped 426m to the West of the site, and the site itself is within an SSSI Impact Risk Zone due to air pollution. No other classified sensitive land uses are mapped either on or within 1000m of the site.

6.0 Visual and Cultural Designations

The site has no Visual or Cultural Designations.

7.0 Potentially Contaminative Sites

7.1 Potentially Contaminative Land Uses

Historical potentially contaminated land uses have been identified within 250m of the site boundary in the form of old Mills adjacent to the site, an old quarry from 109m to the North and other ground workings also close to the site. The electrical sub-station located on the site is the main current potentially contaminative industrial land use.

8.0 Geotechnical Assessment

8.1 Natural Hazards

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

9.0 Mining

The site is noted by the Groundsure Report as being within a Coal Mining area. Upon inspecting the Coal Authority Online Interactive Viewer, the site is not noted as being within a 'Development High Risk Area'. Therefore, no further risk to the site exists from coal mining.

The site is not located within an area of Non-Coal Mining.

10.0 Conceptual Site Model

10.1 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 and follows the procedures set out in the Environmental Agency 'Land Contamination Risk Management' (LCRM) web pages which are accessible via the government website.

LCRM 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. LCRM has adopted and refined the methodology and terminology that has been used in contaminated land risk assessment for a number of years.

LCRM 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
- **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.

10.2 Potential Contamination Sources

10.2.1 On Site Sources

Potential on-site sources of contamination have been identified as possibly contaminated shallow soils around the existing building in the area of the current car parking due to potential historical vehicle use resulting in possible fuel/oil leaks. The electricity sub-station in the South East corner of the site has also been identified as a possible contamination source, due to the possibility of heavy metals being within the shallow soils close to this.

10.2.2 Off Site Sources

Potential off-site sources of contamination have been identified as possible ground gas accumulations due to nearby infilled land features, such as the old quarry and mill ponds.

10.3 Potential Receptors

10.3.1 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.

10.3.2 Controlled Waters Receptors

The following on-site controlled waters receptors include:

- Groundwater within the underlying Aquifers.

10.3.3 Buildings Receptors

The proposed new buildings are a potential receptor.

10.4 Potential Pathways

10.4.1 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.

10.4.2 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 (Principal 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.

10.4.3 Buildings

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

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

10.5 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 C552 guidance, as described in Table 10.1 and Table 10.2.

Table 10.1 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.

Table 10.2 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 10.3), ranging from **Very High Risk** to **Very Low Risk**, with the definitions summarised in Table 10.4.

Table 10.3 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

Table 10.4 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 LCRM, 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 10.5.

Table 10.5 Conceptual Site Model of Potential Pollutant Linkages

Source	Receptor	Pathway	Risk	Comments
Potential hydrocarbons and heavy metal contaminants in soil, soil derived dust, surface water run-off and groundwater from possibly contaminated underlying soils and Made Ground.	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	<p>Potential fuel/oil leaks could have occurred in the area of the car park from vehicles using it throughout the years. The electricity sub-station is also a potential source of contamination due to possible heavy metal contamination resulting from placement of the electrical cables.</p> <p>There also exists a potential risk of ground gases which could affect the site due to nearby infilled land features.</p>
Possible accumulations of Carbon Dioxide and Methane from nearby infilled land features	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	No additional comments
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	No additional comments
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	No additional comments
Contaminants in soil, groundwater and as vapours/ground gas (Carbon Dioxide and Methane)	Building	<ul style="list-style-type: none"> • Accumulation of soil and water derived vapours/and or ground gas in enclosed spaces 	Moderate/Low	Possible ground gas accumulations due to nearby infilled land features.

11.0 Conclusions

The site is proposed to be redeveloped for residential use.

Potential on-site sources of contamination have been identified as possible contaminated soils from fuel/oil leaks and other associated contaminants due to historical vehicle use in the car parking area. Also, a potential of heavy metal contamination may exist close to the area of the electrical sub-station.

Off-site sources of contamination have been identified as possible ground gases from nearby infilled land features.

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

- Contaminants may be present in, on or under the land at the site from both on-site and off-site sources; and
- Future on site receptors to any form of contamination have been identified as the construction workers, residents, 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 10.5. 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 hydrocarbon and heavy metal contaminated soils beneath the site in addition to possible ground gases from off-site sources.

12.0 Recommendations

Due to the potential for contaminated soils beneath the site in addition to possible ground gas accumulations from off-site sources, a Phase II Intrusive Investigation is recommended. This intrusive investigation should allow for collection of shallow soil samples from across the site, to allow an assessment of any possible contaminants within it in addition to the installation of ground gas monitoring standpipe to allow for a detailed ground gas assessment.

13.0 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.