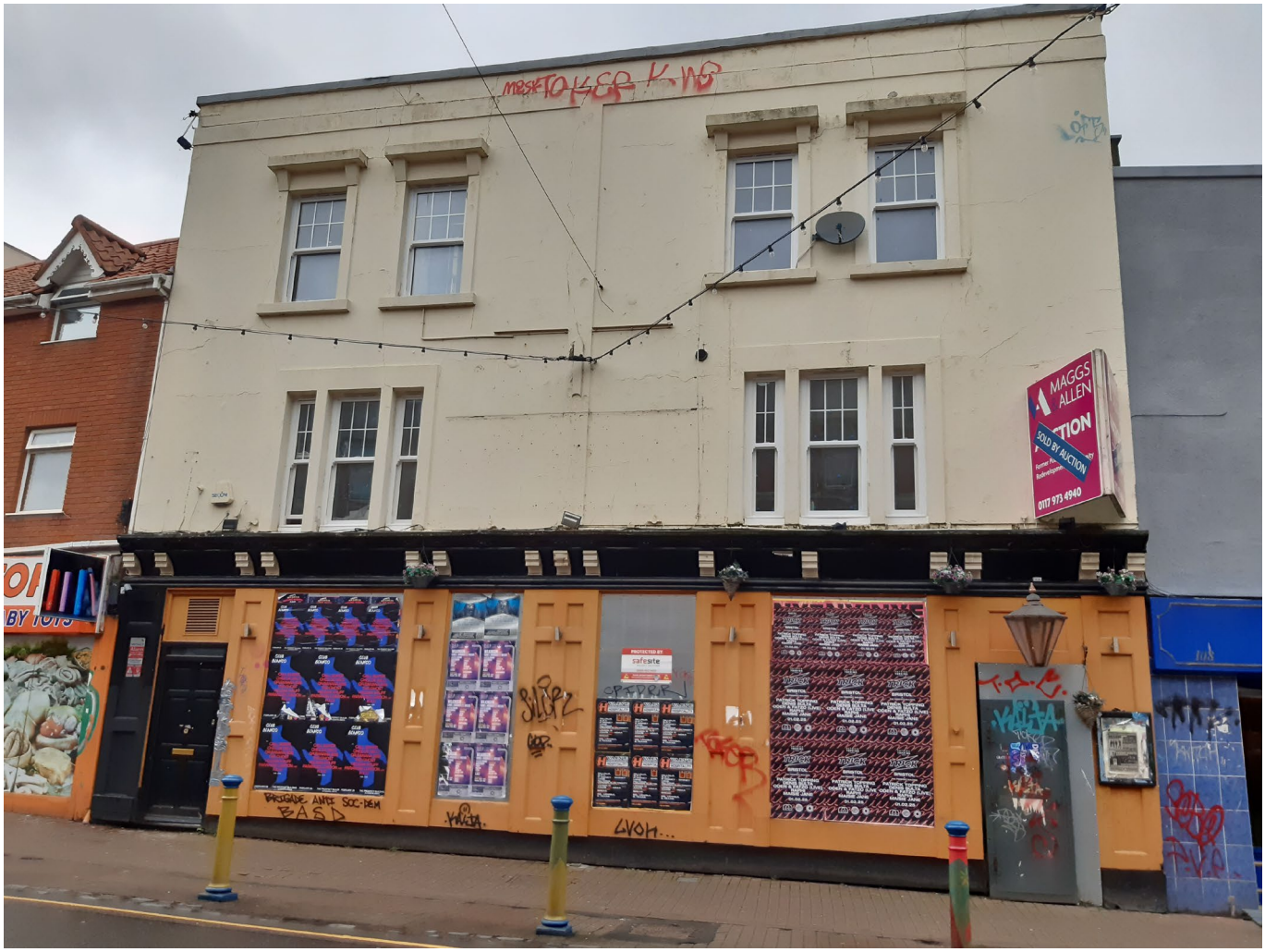


# 110-112 East Street, Bedminster

## Desk Study and Preliminary Risk Assessment

Report No: 738148

Client: TMT Capital Ltd

**FEBRUARY 2025**

STRUCTURAL SOILS LTD

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# CONTENTS

# 1 EXECUTIVE SUMMARY

**1.1** This investigation was carried out by Structural Soils Limited (SSL) on the instructions and on behalf of TMT Capital Ltd (the Client) at 110-112 East Street, Bedminster in Bristol. The purpose of the work was to obtain geoenvironmental information to assist with a planning application. It is proposed to demolish the extensions to the rear of the former public house and to construct a residential block with soft landscaping.

**1.2** The roughly rectangular site is approximately 50 m by 15 m in size with its long axis orientated northwest to southeast. The site is occupied by a three-storey terraced Victorian building, formerly used as a public house, which fronts onto East Street to the southeast. A series of relatively recent, rectangular, single storey outbuildings (formerly used as seating areas and kitchens) covers the central portion of the site while an asphalt yard is present along much of the northeast site margin.

**1.3** The site is underlain by the Redcliffe Sandstone Formation. Tidal Flat Deposits and surficial made ground overlie the Redcliffe Sandstone Formation across the northwest portion of the site. Geological maps indicate the Tidal Flat Deposits to be absent across the southeast portion of the site with made ground resting on the Redcliffe Sandstone Formation.

**1.4** The Mining Remediation Authority (formerly Coal Authority) Map Viewer shows the site not to lie in a Development High Risk Area, or any areas of Shallow Coal Mining or any Mine Entry Zones of Influence. However the Envirocheck report states that the site lies within the Coal Mining Reporting Area and the developer should obtain a Consultants Coal Mining Report to confirm whether the site is at risk from any shallow coal workings or mineshafts.

**1.5** The pre-Ordnance Survey maps found on Know Your Place Bristol show a stream running east-west approximately across the site's narrowest point in the north of the site. This stream may still be present under the site in a culvert so care should be taken when constructing foundations or installing services in this area.

**1.6** A Preliminary Risk Assessment has been undertaken that included research into the past uses of the site and the surrounding area, and production of a contamination conceptual model identifying potentially complete pollutant linkages.

**1.7** The earliest maps from 1855 show the site to have been occupied by a Public House and adjacent residential property fronting onto East Street. The rear portion of the site appears to have been occupied by small outbuildings and a yard area with a steam flowing east-west across it that is culverted by 1884. The site was located in a mixed residential – industrial area with multiple collieries, tanneries, iron and smelting works within 600 m.

**1.8** A small Works building was constructed adjacent to the site to the west between the 1950s-1960s and demolished in the 1990s. This is not considered likely to pose a risk to the site.

**1.9** Environmental datasheets indicate relatively limited development of the site which is positioned within a predominantly urban area containing occasional small trades and commercial premises.

**1.10** The review of the available information and the production of the initial conceptual model and risk assessment has identified risks associated with potentially complete pollutant linkages:

- Linkage 1 - direct contact by future site users with made ground containing metals and hydrocarbons.
- Linkage 6 – inhalation by future site users of asbestos fibres potentially present with the made ground.

**1.11** The two risk linkages identified above relate solely to the proposed landscaping. The proposed development includes a small grassed area about 10 m by 5 m lined with shrubs or small trees on two sides and two other small trees. The site is hard covered and no viable topsoil is likely to be present. A pragmatic way to break these contaminants linkages would be to provide a 600 mm depth of uncontaminated imported soils (topsoil and subsoil) for grass and shrubs. This should be increased to 1 m depth for tree pits. On completion the soil composition and depth would need to be verified by an independent third party such as SSL.

**1.12** Given the existence of made ground on the site it would be prudent to maintain a discovery strategy (watching brief) during site clearance and construction, in case any unexpected contamination is encountered. If suspected contamination is found then a suitably qualified person should undertake appropriate sampling, testing and further risk assessment, and produce a remedial solution to be approved by the Contaminated Land Officer and implemented by the developer.

**1.13** Site, landscape and maintenance workers should wear gloves, boots and overalls and wash their hands before eating, drinking and smoking. Excessive dust generation should be avoided.

# 2 INTRODUCTION

This investigation was carried out by Structural Soils Limited (SSL) on the instructions and on behalf of TMT Capital Ltd (the Client) at 110-112 East Street, Bedminster in Bristol. The purpose of the work was to obtain geoenvironmental information to assist with a planning application. It is proposed to demolish the extensions to the rear of the former public house and to construct a residential block with limited soft landscaping.

The purpose of the work was to undertake a desk study and Preliminary Risk Assessment which included research into the past uses of the site and its surrounding area, with regards its physical, historical and environmental setting. The report identifies potential issues at the site leading to the production of a Conceptual Site Model (CSM) which considers geoenvironmental aspects which could affect the development.

This desk study has been prepared in accordance with British Standards BS 5930:2015+A1:2020 and BS 10175:2011+A2:2017 and all normative references, including the Environment Agency guidance *Land Contamination Risk Management* (*LCRM*, 2023).

All information, comments and opinions given in the desk study in this report are based on the information obtained. The information search cannot be exhaustive and there may be records that have not come to light. There may also be circumstances at the site that are not documented.

This report was prepared by SSL for the sole and exclusive use of TMT Capital Ltd in response to particular instructions. Any other parties using the information contained in this report do so at their own risk and any duty of care to those parties is excluded. No liability will be accepted after a period of 6 years from the date of the report.

## 2.1 Information Sources

The following sources of information have been used in the preparation of this report.

- Extracts of available historical Ordnance Survey (OS) maps covering the period from 1884 to 2024 which are presented in Appendix B.
- An Envirocheck report produced by Landmark for an area up to 1 km from the centre of the site which is reproduced in Appendix B. The Envirocheck report is compiled from the database of information maintained by various statutory bodies listed within the report. It also includes a series of maps showing the approximate position of the listed data together with details on geology, ground workings, mining and extraction, borehole records, and estimated background chemistry.
- Bristol City Council Contaminated Land Search letter (Ref: NH/EIR/459782) – 110-112 East Street, Bristol, BS3 4EY, 10 February 2025
- RSK Ordnance Management, Preliminary Explosive Ordnance Risk Assessment (Ref: S1RA-1044) – 110-112 East Street, Bristol, dated January 2025.
- The Department for Environment, Food and Rural Affairs (DEFRA) and British Geological Survey (BGS) websites

# 3 SITE DETAILS

## 3.1 Location and Topography

The site is located at 110-112 East Street in Bedminster, Bristol. The British National Grid Reference of the site is ST 584 715.

The roughly rectangular site is approximately 50 m by 15 m in size with its long axis orientated northwest to southeast (see Proposed Site Layout Plan in Appendix A).

The site is flat and set at an elevation of approximately 11 m above Ordnance Datum (AOD).

### 3.1.1 Site Reconnaissance

A walkover survey of the site was undertaken on 28 January 2025 and its findings are detailed in the following paragraphs.

The site is occupied by a three-storey terraced Victorian building, formerly used as a public house with accommodation on the upper floors, which fronts onto East Street to the southeast. The pub is currently a construction site with the upper storeys being converted into student accommodation, whilst the ground floor is being developed with storage areas and as a commercial unit. A basement is present which is currently used for the storage of pub furniture and contains an air compressor, refrigeration unit and canisters of nitrogen and carbon dioxide. Water, gas, electric and foul water feeds enter the site through the basement from East Street.

Covering the central portion of the site are a series of relatively recent rectangular single storey extensions to the public house, which were formerly used as seating areas and kitchens. These areas are currently used for the storage of construction materials. The extensions form a small open air tiled courtyard area, which was used as a smoking area. An asphalt yard is present along much of the northeast site margin and up to the northwest end of the site where a set of wooden gates allow access to Herbert Street. No areas of soft landscaping are present on the site.

No visual or olfactory indicators of contamination were identified during the site walkover.

The land use of the surrounding area is mixed used residential-commercial with the adjacent buildings used as ground floor retail units with presumed residential accommodation occupying the upper floors.

## 3.2 History of Site and Surrounding Area

### 3.2.1 Historic Mapping

A search of Ordnance Survey maps was undertaken to establish the land-use history of the site and surroundings. Extracts of the maps that are discussed below can be found in Appendix B of this report. Unless otherwise stated, all quoted distances are measured from the site boundary that is marked on the maps.

| TABLE 1 :SUMMARY OF HISTORICAL MAP DATA | | | |
|---|---|---|---|
| **Dates** | **Scale** | **Significant features, changes and developments:** | |
| | | **On site** | **In surroundings [distance(m)]** |
| 1855 Ashmead map on Bristol Know Your Place website | n/a | Four buildings occupy the southeast half of the site fronting onto East St<br>A stream runs across the northwest part of the site, with the northern end of the site lying beyond the stream to the north | Surrounding area shown as housing and possible small businesses centred on East St.<br>Vacant land to north of stream |
| 1884-1886 | 1:10,560 & 1:2,500 & 1:500 | Stream not shown: may be culverted.<br>Site occupied by a *Public House* and adjacent residential property across the southeast portion of the site.<br>Small outbuildings and a possible yard area present across the northwest portion of the site. | Stream not shown: may be culverted.<br>Site located in mixed residential – industrial area.<br>*Timber Yard* situated 50 m to W.<br>*Dean Lane Colliery* present 110 m to NW.<br>*Coal Yard* located 135m to NE.<br>*Bedminster Smelting Works* situated 230m to E.<br>Tanneries present 230m to NE.<br>*Malago Vale Brick & Tile Works* located 250m to S.<br>*Malago Vale Iron Works* present 390m to S.<br>*Malago Colliery* located 600m to SW. |
| 1903-1905 | 1:10,560 & 1:2,500 | No changes | Tannery present 230m to NW redeveloped as *Tabacco Factory*.<br>*Printing & Stationery Works* present 110m to SW. |
| 1916-1918 | 1:2,500 | No changes | No significant changes |
| 1930-1938 | 1:10,560 & 1:2,500 | No changes | Dean Lane Colliery redeveloped as *playground* 110 m to NW. |

| TABLE 1 :SUMMARY OF HISTORICAL MAP DATA | | | |
|---|---|---|---|
| **Dates** | **Scale** | **Significant features, changes and developments:** | |
| | | **On site** | **In surroundings [distance(m)]** |
| | | | Malago Colliery redeveloped for residential land use 600m to SW. |
| 1953-1969 | 1:10,560 & 1:2,500 | Expansion of *Public House* to include presumed residential property across the southeast portion of the site. | Small *Works* (about 20 m by 15 m) built adjacent to west<br>Demolition of residential terrace adjacent to NW margin.<br>Bedminster Smelting Works redeveloped as mixed commercial-residential buildings, 230m to E.<br>Malago Vale Brick & Tile Works redeveloped as Smelting Works, 250m to S.<br>Malago Vale Iron Works redeveloped as *Storage Depot,* 390m to S. |
| 1964-1983 | 1:10,000 & 1:1,250 | Small building constructed at the northwest margin. | Demolition of residential terraces and construction of high-rise residential blocks, 50m to N.<br>Tabacco Factory redeveloped as *Superstore* 230m to NE.<br>Multiple small vehicle garages present within 150m to SE. |
| 1992-1999 | 1:10,000, 1:1,250 & Aerial Photograph | Small building demolished at the northwest margin.<br>Possible extension to rear of public house. | Works building demolished (Google Earth).<br>Tannery demolished and replaced by residential properties, 230m to NE. |
| 2024 | 1:10,000 &<br>Aerial Photograph | No changes | Small Works site redeveloped into residential block circa 2009-2013<br>No significant changes |

Note: N = north, S = south, E = east, W = west.

### 3.2.2 Planning History

Planning records held by Bristol City Council pertaining to the site date from 1994, when permission was granted for alterations to the front and rear elevations of the public house.

Subsequent planning consents of note are referenced in the following:

| TABLE 2 :SUMMARY OF PLANNING HISTORY DATA | |
|---|---|
| **Dates** | **Details** |
| 2004 | **Ref: 04/00026/F**<br>Conversion of upper floors to provide 4 no. self-contained flats (Use Class C3).<br>Outcome: Granted subject to conditions |
| 2005 | **Ref: 05/00182/F**<br>Construction of a two-storey rear extension comprising 4 no. self-contained flats.<br>Outcome: Application withdrawn |
| | **Ref: 05/02277/F**<br>Single storey rear extension to existing public house including external garden area.<br>Outcome: Granted subject to conditions |
| 2006 | **Ref: 06/00045/F**<br>Demolition of buildings adjacent to the car park at the rear and construction of a single-storey extension.<br>Outcome: Granted subject to conditions |
| 2023 | **Ref: 23/00686/F**<br>Creation of 2 no. small houses in multiple occupation for 3-6 people (C4) at first and second floor level (in existing pub building).<br>Outcome: Granted subject to conditions |

### 3.2.3 Summary of Site History

The earliest maps from 1855 show the site to have been occupied by a Public House and adjacent residential property fronting onto East Street. The rear portion of the site appears to have been occupied by small outbuildings and a yard area with a steam flowing east-west across it that is culverted by 1884. The site was located in a mixed residential – industrial area with multiple collieries, tanneries, iron and smelting works within 600 m.

A small Works building was constructed adjacent to the site to the west between the 1950s-1960s and demolished in the 1990s. This is not considered likely to pose a risk to the site.

The site appears to have remained unchanged through to the 1950s when the Pub took over the adjacent residential property. Minor redevelopment in the 1960s involved the construction and subsequent demolition of a small outbuilding. Recent aerial photography indicates the construction of extensions constructed at the rear of the Pub up to Herbert Street to the north.

Redevelopment of the surrounding area through the 20$^{th}$ century saw the closure of heavy industries and the evolution to a mixed residential – commercial area with superstores, retail units, warehouses and small vehicle garages present.

# 4 PHYSICAL SETTING

## 4.1 Geology

Information on the geology of the site was obtained from the following sources published by the British Geological Survey (BGS):

- BGS map (sheet 264, scale 1:50,000, published 2004).
- The BGS GeoIndex (onshore) digital geology map, which utilises the most up to date names for geological units. (https://www.bgs.ac.uk/map-viewers/geoindex-onshore/)
- The BGS Lexicon of Named Rock Units, which provides typical descriptions for most geological units (https://webapps.bgs.ac.uk/lexicon/).

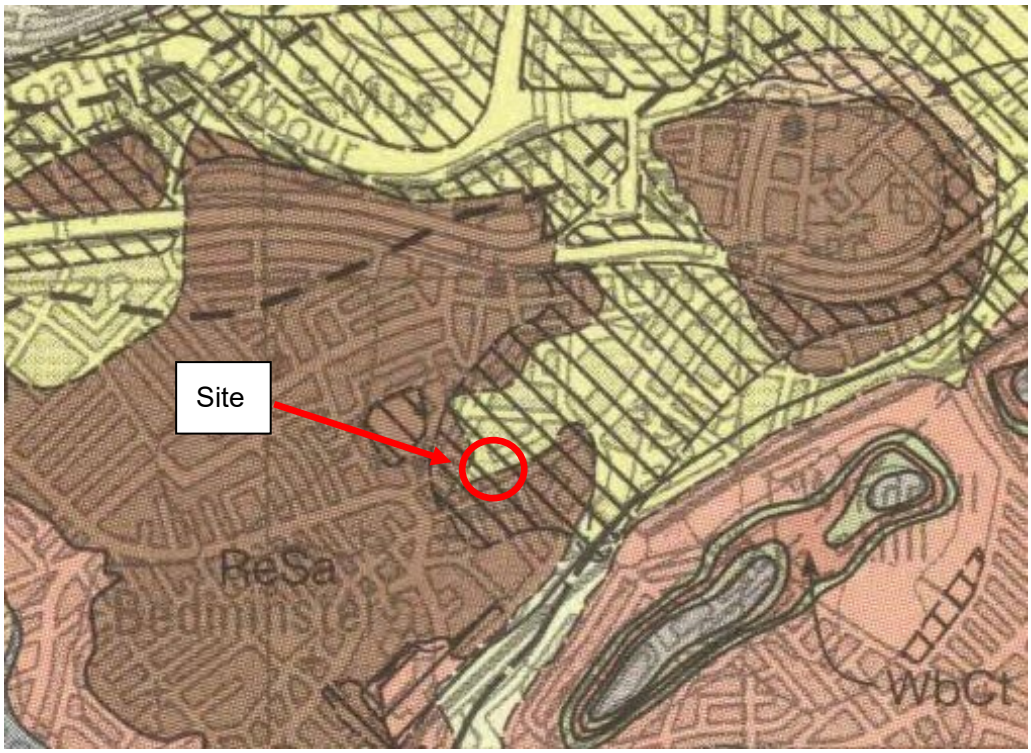
The site is shown to be underlain by the following descending sequence of strata:

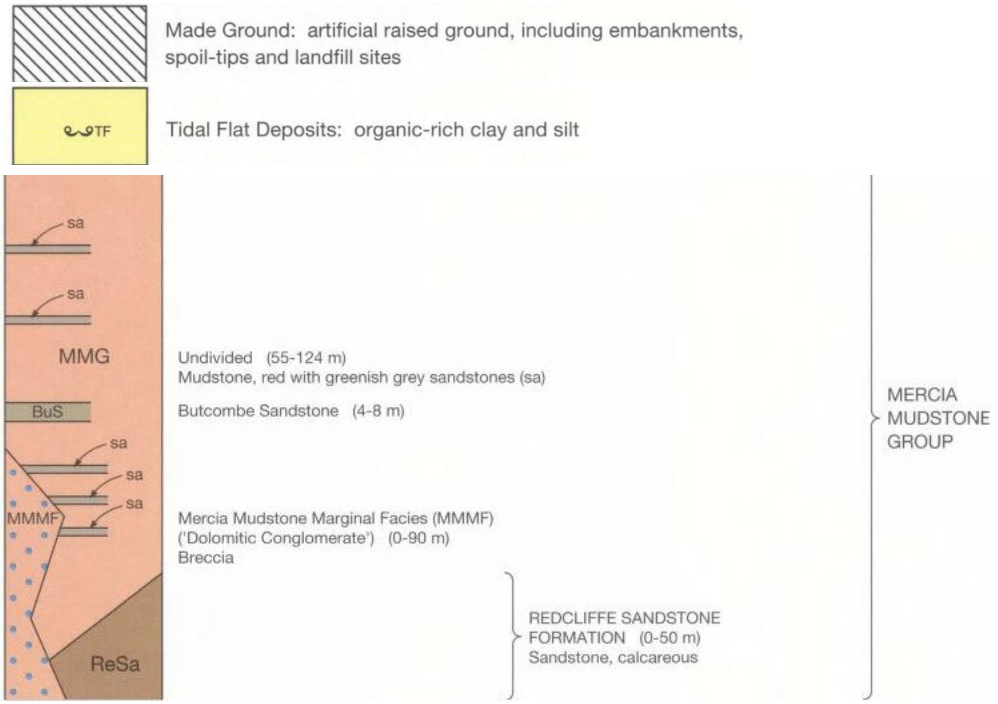
| TABLE 3 SUMMARY OF EXPECTED SITE GEOLOGY | |
|---|---|
| **Geological Unit Name** | **Description** |
| **ANTHROPOGENIC GROUND** | |
| Artificial Ground present | |
| **SUPERFICIAL DEPOSITS** | |
| Tidal Flat Deposits | Organic rich clay and silt |
| **SOLID GEOLOGY** | |
| Redcliffe Sandstone Formation | Sandstone, distinctive fine- to medium-grained, deep red, calcareous and ferruginous. Commonly weathered to uncemented sand at shallow depths below the surface, |

Note: Information obtained from BGS digital records © NERC.

The geological maps show the site to be underlain by the Redcliffe Sandstone Formation bedrock. Tidal Flat Deposits and superficial made ground overlie the Redcliffe Sandstone Formation across the northwest portion of the site. The maps indicate the Tidal Flat deposits to be absent across the southeast portion of the site with made ground resting on the Redcliffe Sandstone Formation.

The BGS online maps portal provides access to scans of almost all maps produced by the BGS since 1932. An extract of the most recent available scanned map for the site is included below:




Note: Above images contain British Geological Survey materials © NERC [2025].

## 4.2 Hydrogeology and Hydrology

### 4.2.1 Aquifer Designation

Data included in the Envirocheck report shows that the Environment Agency (EA) has classified the geological units underlying the site as follows:

- Tidal Flat Deposits as Unproductive Strata.
- Redcliffe Sandstone Formation as a Secondary 'A' Aquifer (variably permeable).

'Unproductive Strata' are rock layers or superficial deposits with low permeability that have negligible significance for water supply or river base flow.

Secondary 'A' Aquifers are permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers.

### 4.2.2 Groundwater Vulnerability Zones

Information on the leaching potential of the soils directly under the site is given in data obtained from the Environment Agency (EA) and included in the Envirocheck report.

For this site the Redcliffe Sandstone Formation is classified as being of high vulnerability to pollution.

The Tidal Flat Deposits being unproductive strata have not been designated with a groundwater vulnerability classification.

### 4.2.3 Source Protection Zones

The site is not located with a Source Protection Zone (SPZ).

### 4.2.4 Anticipated Groundwater flow / direction

Groundwater beneath the site is expected to be present within the Redcliffe Sandstone Formation. Based on the geological mapping this is expected to be an unconfined aquifer and it is expected to be recharged by precipitation which infiltrates at the site. Groundwater flow within this unit is expected to be a combination of intergranular and fissure flow. Flow is anticipated to be towards the northeast.

The closest down hydraulic gradient surface water body to the site is The Malago (stream) located 200 m to the northeast. Groundwater is likely to be in continuity with this feature.

## 4.3 Ground Gas

### 4.3.1 Radon

According to the Envirocheck Report, the estimated proportion of homes near the site that are above the radon action level is <1%. Therefore radon protection measures are not considered necessary in the construction of new buildings (including extensions, conversions and refurbishment projects).

### 4.3.2 Coal Measures

Coal Measures strata, which underlie the site at greater depth than the geological units mentioned in Section 3, are considered likely to be too deep to pose a plausible risk of ground gas migration to the site, and are also likely to lie at too great a depth for underground voids due to coal workings to pose a structural risk to the development.

The Mining Remediation Authority (formerly Coal Authority) Map Viewer shows the site not to lie in a Development High Risk Area, or any areas of Shallow Coal Mining or any Mine Entry Zones of Influence

However the Envirocheck report states that the site lies within the Coal Mining Reporting Area and the developer should obtain a Consultants Coal Mining Report to confirm whether the site is at risk from any shallow coal workings or mineshafts.

### 4.3.3 Made Ground

Made ground is anticipated within the rear yard areas of the site. The made ground is likely to comprise of reworked soils containing anthropogenic materials, whilst ash and other organic material such as timber could be present which may generate methane and carbon dioxide. Historic development is limited to the demolition of a residential property and minor outbuildings across the southwest portion of the site, so a significant thickness of made ground is not anticipated. Consequently the made ground is not considered a significant gas risk.

### 4.3.4 Natural Soils

The Tidal Flat Deposits are identified to comprise organic clay and silt and therefore may potentially contain layers or inclusions of peat. The small stream flowing across the north of the site may also have some Alluvium associated with it, although none is shown on the 1:50,000 map. These deposits can be expected to contain elevated concentrations of methane, carbon dioxide, and hydrogen sulphide but actual generation rates for such deposits are low, with the low permeability ground restricting the migration of historically generated gas.

### 4.3.5 Historic Stream in the North of the Site

As discussed in Section 3.2 Site History the pre-Ordnance Survey maps found on Know Your Place Bristol show a stream running east-west approximately across the site's narrowest point in the north of the site. This stream may still be present under the site in a culvert so care should be taken when constructing foundations or installing services in this area.

### 4.3.6 Archaeology / Ecology

No archaeological or ecological consultation has been undertaken for this study.

## 4.4 Unexploded Ordnance (UXO)

A preliminary UXO risk assessment report has been obtained for the site and is presented within Appendix B.

The report identifies the site to be located within the Country Borough of Bristol which was subject to an overall very high density of bombing in WWII. The closest recorded bomb strike was approximately 70 m east, although due to damage observed in post-WWII aerial photography, this may have fallen as close as 30 m to the site. Other consulted bomb maps did not record bombing in close proximity to the site.

The southern section of the site, comprising a seemingly undamaged pub, is thought to have been frequently accessed during WWII. As such, a UXB strike to this location is thought likely to have been reported at the time. The rest of the site comprised open undeveloped ground which is unlikely to have been accessed frequently, potentially leading to a higher likelihood of a UXB strike remaining unnoticed. Due to the small size of this area and lack of bombs recorded in close proximity to the site, this is not thought to warrant further investigation.

UXO Safety Awareness Briefings are strongly recommended for future ground workers.

## 4.5 Utilities

The site and surrounding area are likely to contain underground services; a copy of the utility data has not been provided by the Client at the time of writing this report.

# 5 ENVIRONMENTAL SETTING

## 5.1 Environmental Data

Environmental features such as landfills, groundwater abstraction points, etc, are detailed in the Landmark Envirocheck report that can be found in Appendix B of this report. 'Notable' features in these data sets are listed below.

| TABLE 4 : SUMMARY OF SIGNIFICANT ENVIRONMENTAL DATA | | | | | |
|---|---|---|---|---|---|
| **Data Types Showing Notable Issues** | **No. of Notable Listings (or Yes/No) and Distance (m) from Site** | | | | **Details of Notable Listings** |
| | **On site** | **0-250** | **250-500** | **>500** | |
| **AGENCY AND HYDROLOGICAL** | | | | | |
| BGS Flooding Susceptibility | Yes | Yes | - | - | Limited potential for groundwater flooding to occur. |
| Discharge Consents | - | 3 | 17 | 43 | Nearest: Wessex Water Services – Storm Sewage Overflow, 193 m to SW. |
| Local Authority Pollution Prevention and Controls (and enforcements) | - | 2 | 4 | 10 | Nearest: *Stafford Street Garage*, 120 m to SE. |
| Nearest Surface Waters | - | Yes | - | - | *The Malago* (Stream), 215 m to E. |
| Pollution Incidents to Controlled Waters | - | - | - | 1 | Concrete pollution: Category 3 – minor incident with impact to water (1999), 908 m to S. |
| Prosecutions Relating to Authorised Processes | - | - | 4 | - | *Bedminster Motor Services*, 304 m to NE. |
| Registered Radioactive Substances | - | - | - | 13 | Nearest: *Bristol General Hospital* (Defunct), 615 m to NW. |
| Substantiated Pollution Incidents | - | - | - | 1 | Category 1 – major incident with impact to water (2015), 503 m to S |
| Water Abstractions (Licensed) | - | - | - | 14 | Nearest: *Lloyds Bank Plc*, 667 m to N |

| TABLE 4 : SUMMARY OF SIGNIFICANT ENVIRONMENTAL DATA | | | | | |
|---|---|---|---|---|---|
| **Data Types Showing Notable Issues** | **No. of Notable Listings (or Yes/No) and Distance (m) from Site** | | | | **Details of Notable Listings** |
| | **On site** | **0-250** | **250-500** | **>500** | |
| Risk of Flooding/Flood Storage Areas | Yes | - | - | - | Within extent of extreme flooding of river without defences. |
| **WASTE** | | | | | |
| Management and Transfer Sites | - | - | - | 7 | Nearest Waste Management: *R G Bradley* (Vehicle Dismantlers), 705 m to E. Nearest Waste Transfer: *Abacus Bristol Ltd*, 705 m to S. |
| Potentially Infilled Land | - | 2 | 2 | 3 | Nearest: Infilled water feature (Stream),493 m to S. Nearest: Infilled ground, 109 m to NW. |
| Treatment and Disposal Sites | - | - | - | 2 | Nearest: *Atex Breakers* (Scrapyard), 749 m to E. |
| **HAZARDOUS SUBSTANCES** | | | | | |
| Hazardous Substances (Installations, Consents & Enforcements) | - | - | - | 3 | Nearest: British Gas Transco Plc. - *Malago Vale Gas Works*, 886 m to S. |
| **INDUSTRIAL LAND USE** | | | | | |
| Fuel Station Entries | - | - | 1 | 4 | Nearest: *West End Service Station* (Obsolete), 451m to NW. |
| Contemporary Trade Directory Entries | - | 29 | 97 | 165 | Nearest: Bright House (Electrical Goods Retailer), 4 m to SW. |
| Manufacturing and Production | - | 12 | 18 | 41 | Nearest: Unspecified Works, 7 m to SW. |

Note: N = north, S = south, E = east, W = west.

### 5.1.1 Environmental Data from Other Sources

#### *5.1.1.1 Local Authority Contaminated Land Search*

A Contaminated Land Search has been undertaken by Bristol City Council for the site and is presented within Appendix B. This confirms the site history as gleaned from other sources and does not identify any particular concerns relating to the site.

### 5.1.2 Summary of Environmental Data

The historic maps and environmental datasheets indicate relatively limited development of the site which is positioned within a predominantly urban area containing occasional small trades and commercial premises.

# 6 GEOENVIRONMENTAL ASSESSMENT

## 6.1 Initial Conceptual Model

The information presented in Sections 3, 4 and 5 has been used to compile an initial conceptual model. The identified potential sources of contamination, associated contaminants and receptors have been considered with plausible pathways that may link them. The resulting potential pollutant linkages are considered in Section 6.2. The risk classification has been estimated in accordance with information in Appendix B.

### 6.1.1 Summary of Potential Contamination Sources

Potential source and their associated contaminants of concern are summarised in the table below.

| TABLE 5 :SUMMARY OF POTENTIAL SOURCES AND CONTAMINANTS | |
|---|---|
| **On Site** | **Contaminants of Concern** |
| Made Ground<br>(from previous and existing development on site) | Heavy metals, asbestos, hydrocarbons |

### 6.1.2 Summary of Potential Receptors

Considering the setting of the site and the proposed redevelopment, sensitive receptors are considered to include:

- future site occupants
- adjacent site users
- potable water supply pipes
- groundwater beneath the site

Please note that construction workers have not been identified in the conceptual model as receptors because risks are considered to be managed through health and safety procedures including CDM regulations.

### 6.1.3 Pathways

Pathways that could results in a potentially complete contaminant linkage include:

- direct contact (soil and dust ingestion, dust inhalation and dermal contact)
- inhalation of vapour
- permeation of plastic water supply pipes
- leaching
- lateral and vertical migration of vapour and dissolved phase contaminants

### 6.1.4 Data Gaps and Uncertainty

Although attempts have been made to identify potential sources of contamination, there may be sources or incidents, such as pollution events, that have not been recorded in the historical and environmental records consulted as part of this investigation.

## 6.2 Preliminary Risk Assessment

### 6.2.1 Risk Estimation for Potentially Complete Contaminant Linkages

The preliminary risk assessment and potentially complete contaminant linkages are detailed in the table below. The risk classification has been undertaken in accordance with CIRIA C552, with a summary of the relevant section being included below the table and in more detail in Appendix B. LCRM follows a tiered approach to risk assessment, with the preliminary risk assessment being Tier 1 of Stage 1.

| TABLE 6 : PRELIMINARY RISK ASSESSMENT | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Linkage** | **Potential source** | **Contaminant(s) of potential concern** | **Potential receptor** | **Possible pathway** | **Likelihood** | **Severity** | **Potential risk** | **Justification** |
| 1 | Made Ground | May contain heavy metals, polycyclic aromatic hydrocarbons (PAH), total petroleum hydrocarbons | Future site users | Oral, dermal and inhalation exposure | Likely | Medium | Moderate | The site has experience limited phases of development involving the demolition of Victorian outbuildings and the construction of extensions to the pub. Consequently, shallow soils comprising made ground are likely to contain anthropogenics and potential contaminants. An area of soft landscaping is proposed near the centre of the site where site users may come into contact with potentially contaminated soils. |
| 2 | | | Adjacent site users | | Unlikely | Medium | Low | Adjacent site users are unlikely to come into contact with site soil or airborne dust following completion of the development. Risks can be managed via good working practices during site construction during periods of dry weather including damping down to avoid airborne dust. |
| 3 | | | Groundwater within Secondary 'A' aquifer | Leaching from soils/ percolation to aquifer/ lateral migration | Unlikely | Medium | Low | Contaminants may be available for leaching and migration to groundwater in the Secondary 'A' Aquifer, but it is considered unlikely that significant leachable or mobile contamination is present widely within the made ground on site. It is understood that much of the site will remain covered by hardstanding, which will limit the infiltration of precipitation to a proposed small garden located in an area that has historically remained undeveloped, and is likely underlain by low permeability superficial clays. |
| 4 | | Volatile organics/ hydrocarbons | Potable water pipes | Direct contact with contaminated soils and groundwater/ permeation into pipes | Unlikely | Medium | Low | The history of the site and vicinity does not indicate a significant risk of volatile contaminants (hydrocarbons or other organic compounds) being present on the site. |
| 5 | | | Future site users | Inhalation | Unlikely | Medium | Low | |
| 6 | | May contain asbestos | Future site users | Inhalation of asbestos fibres | Likely | Medium | Moderate | The construction of the public house and its extensions are likely to have incorporated asbestos containing materials. Consequently there is potential for fragments of asbestos containing material (ACM) or loose asbestos fibres to have been incorporated into shallow soils. An area of soft landscaping is proposed near the |

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|---|---|---|---|---|---|---|---|---|
| **Linkage** | **Potential source** | **Contaminant(s) of potential concern** | **Potential receptor** | **Possible pathway** | **Likelihood** | **Severity** | **Potential risk** | **Justification** |
| | | | | | | | | centre of the site where site users may come into contact with potentially contaminated soils. |
| 7 | | | Adjacent site users | | Unlikely | Medium | Low | Adjacent site users are unlikely to come into contact with site soil or airborne dust following completion of the development. Risks can be managed via good working practices during site construction during periods of dry weather including damping down to avoid airborne dust. |

The Risk Classification System defined in CIRIA C552 is as follows:

| TABLE 7 : CIRIA C552 RISK CLASSIFICATION MATRIX | | | | | |
|---|---|---|---|---|---|
| | | **Consequences** | | | |
| | | **Severe** | **Medium** | **Mild** | **Minor** |
| **Probability** | **Highly likely** | Very high | High | Moderate | Moderate/ low |
| | **Likely** | High | Moderate | Moderate/ low | Low |
| | **Low likelihood** | Moderate | Moderate/ low | Low | Very low |
| | **Unlikely** | Moderate/ low | Low | Very low | Very low |