



Contaminated Land Solutions

PHASE 1 SITE INVESTIGATION

Deben House, Lawrence Hill, Bristol

For

Landrose Ltd

May 2021

Project No. 001SACOP1

Prepared by

Wesson Environmental

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The material and data in this report were prepared under the supervision and direction of the undersigned.

Wesson Environmental

**Prepared by: Dr. Richard Wesson
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Date

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1.0 Introduction

1.1 General

Wesson Environmental were commissioned to carry out a Phase 1 Site Investigation of the site located at Deben House, Lawrence Hill, Bristol.

The report uses documentary data (refs. 1, 2, 3).

The purpose of this report is to assess the potential risks to human, controlled water receptors and to the wider environment arising from past and present land use, and naturally occurring features present at or near the site.

1.2 Scope of report

This report aims to identify and address the following issues related to the use of the site for a material recycling facility:

1. The potential presence of any contaminants.
2. Pathways which may feasibly exist between contaminant sources and receptors.
3. Potential impact on human, controlled waters and the wider environment.

The report will conclude with a preliminary risk assessment which will address issues associated with potential contaminants on the site based on the collation of documentary data.

2.0 Site Location and Description

The site is located at National Grid Reference 360251 173416 and covers an area of approximately 0.09 ha.

Current Site Use:

The site comprises a commercial building split into individual business units.

Site Boundaries:

Road are present on all sides except to the east where commercial buildings are present.

Surrounding Site Use:

The surrounding area is predominantly residential in nature.

Storage Tanks:

No storage tanks are present on the site.

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3.0 Site History

Historical maps have been procured from the Ordnance Survey, which show development of the site and its surrounding area from 1884– 2020.

These maps are contained in Appendix B. Please note that maps showing no significant change to the site or surrounding area are not referred to in this section.

Site Area	Date	Scale	Surrounding Area
The site coincides with a brewery.	1884	1:2500	The immediately surrounding area is taken up by the brewery. A graveyard is shown 130m to the west with a slaughterhouse 230m to the south west. A railway is present 230m to the south. A tramway is present on the road to the south of the brewery.
The brewery is no longer present. The site outline coincides with a smaller building that appears to have been divided into individual units.	1903	1:2500	The majority of the area to the east has been cleared with individual units present on the southern part of this area adjacent to the site.
	1918	1:2500	The properties to the south east have expanded to the east and appear consistent in layout with residential or retail units. Large buildings, possibly industrial are shown to the north east. A large, possibly industrial building is shown 20m to the south west. A rope walk is present 80m to the south.
The majority of the site is shown as a bank with the eastern part shown as 1-5.	1950	1:1250	A sports club is shown to the north east. Engineering works are shown 30m to the north east and 20m to the north. Various buildings are shown as warehouses to the east. A telephone exchange is present 70m to the north west. The large building to the south west is no longer present, and a ruin is shown to the west of where it was located indicating that it may have been destroyed by bombing.
	1971	1:1250	Buildings to the south and south west of Lawrence Hill have been removed with new residential properties present in their place. A further engineering works is shown 50m to north west.
A bank is no longer shown.	1985	1:1250	A sports centre is present 120m to the north.
	1993	1:1250	The engineering works are no longer present to the north, with a business park shown in this location. Buildings on the eastern part of the block the site is linked to have been removed. A club is shown immediately to the east.

3.1 Areas of Disturbed Ground

An area 100m to the east has been excavated to allow construction of an underpass.

3.2 Intended Site Use

Proposed change of use of existing building to create a residential property and associated facilities including a Class E Commercial, Business and Service Unit (Ground Floor), a Class F.1 Learning and Non Residential Institutions Unit (Basement) and a Class E Commercial, Business and Service Unit (Basement).

3.3 Historical Industrial sites

3.3.1 Potentially Contaminative Uses identified from 1:10,000 scale Mapping.

240 records found within 500m. Nearest:
18m NW. Unspecified Works. Date: 1973 – 1986.
20m N. Unspecified Commercial/Industrial. Date: 1986.
20m N. Unspecified Works. Date: 1973.

3.3.2 Historical Tank Database

55 records found. Nearest:
83-84m NW. Unspecified Tank. Date: Unspecified Tank.

3.3.3 Historical Energy Features Database

31 records found. Nearest:
88m NW. Electricity Substation. Date: 1990-1994.

3.3.4 Historical Petrol and Fuel Site Database

1 record found:
410m E. Filling station. Date: 1984.

3.3.5 Historical Garage and Motor Vehicle Repair Database

7 records found. Nearest:
331m NW. Garage. Date: 1968.

3.3.6 Historical military sites

No records found.

4.0 Geological Setting

4.1 Geology

Current geological maps of the region² have been consulted to provide information on geological conditions associated with the site.

Artificial/Made Ground:

The nearest record is located 263m south west of the site and refers to Made Ground (Undivided).

Superficial Geology:

No superficial deposits underlie the study site.

Bedrock/solid geology:

Bedrock underlying the site is shown as Sandstone of the Redcliffe Sandstone Member. Intergranular flow is present and permeability is classified as moderate to high.

4.1.1 Man Made/ Induced Hazards

Hazard	Risk
Natural cavities	No records found.
BritPits	2 records found. Nearest: 251m S. Commodity: Coal, Deep. Ceased.
Surface ground workings	No records found.
Underground workings	5 records found. Nearest: 515m NE. Disused colliery. Date: 1921.
Non-coal mining	No records found.
Mining cavities	No records found.
Coal Mining	The site is located within a coal mining area as defined by the Coal Authority. A Consultants Coal Mining Report is recommended to further assess coal mining issues at the site. This can be ordered directly through Groundsure or your preferred search provider.
Brine extraction	No records found.
Gypsum extraction	No records found.
Tin Mining	No records found.
Clay mining	No records found.

4.1.2 Natural Hazards

Hazard	Risk
Shrinking/Swelling clay	Negligible
Running Sand	Low
Compressible deposits	Negligible
Collapsible deposits	Very Low
Landslides	Very Low
Ground Dissolution	Negligible
Radon	Less than 1% of properties are above the Action Level. No radon protective measures are necessary.

5.0 Environmental Setting

5.1 Hydrology and Hydrogeology

Groundwater:

Bedrock is classified as a Secondary A aquifer. These 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

Soil Vulnerability:

Soils are classified as being intermediate leaching class with an infiltration value of <40% and a dilution factor of 300-550mm/year.

5.1.1 *Surface and Groundwater Abstraction Points*

1 groundwater abstraction is shown within 1000m:
432m S. Details: Process Water.

12 surface water abstractions are shown within 1000m. Nearest:
880m SW. Details: Non-Evaporative Cooling/heat pump.

No potable water abstractions are shown within 1000m.

5.1.2 *Source Protection Zones*

No Source Protection Zones are shown within 500m.

5.1.3 *Surface water*

No records found within 250m.

5.1.4 *Surface Water Flooding*

No Risk of Flooding from Rivers and The Sea (RoFRaS) records are shown within 50m of the study site.

Ambiental Risk Analytics surface water (pluvial) FloodMap identifies areas likely to flood as a result of extreme rainfall events, i.e., land naturally vulnerable to surface water ponding or flooding and classifies the highest risk on site as Negligible.

5.1.5 *River and coastal flooding - Flood Zones*

No flood zones are shown within 50m of the study site.

5.1.6 *Groundwater flooding*

The highest risk on site is classified as Negligible.

5.2 Sensitive Land Uses

Uses within 1km.

Designation	Details
Sites of Special Scientific Interest (SSSI)	No records found.
Ramsar sites	No records found.
Special Areas of Conservation (SAC)	No records found.
Special Protection Areas (SPA)	No records found.
National Nature Reserves (NNR)	No records found.
Local Nature Reserves (LNR)	No records found.
Ancient Woodland	No records found.
Biosphere Reserves	No records found.
Forest Parks	No records found.
Marine Conservation Zones	No records found.
Green Belt	No records found.
Nitrate Sensitive Areas	No records found.
Nitrate Vulnerable Zones (NVZ)	No records found.
World Heritage Sites	No records found.
Areas of Outstanding Natural Beauty (AONB)	No records found.
National Parks (NP)	No records found.

5.3 Landfill and Other Waste Sites

Uses within 1km.

Records Searched:	Details
Active or recent landfill	No records found
Historical landfill (BGS records)	No records found
Local Authority and Mapping Records	No records found
Historical Landfills from EA/NRW	2 records found. Nearest: 410m S. Waste Type: Inert, Industrial, Household, Special. Date: 1984-1986.
Historical waste sites	10 records found. Nearest: 276m SW. Type of Site: Refuse Transfer Station. Date: 1988.
Licensed waste sites	10 records found. Nearest: 182m SE. Type of Site: Household, Commercial & Industrial Waste Transfer Stn
Waste exemptions	86 records found. Nearest: 101m NW. Storing waste exemption. Storage of waste in secure containers.

5.4 Current Land Use

There are 23 Contemporary Trade Directory Entries recorded within 250m of the study site. Of these, 4 are located within 100m:

On site. Recording Studios and Record Companies.
 31m S, 90m NW. Electricity substation.
 98m NW. Structural engineers.
 Full details are contained in Appendix C.

5.5 Petrol and Fuel Sites

2 records found. Nearest:
 287m N. Obsolete.

5.6 Electricity cables

No records found.

5.7 Underground Gas Pipelines

No records found.

5.8 Environmental permits, Incidents and Registers

Industrial Sites Holding Licences/ Authorisations:	Records Held:
Sites Determined as Contaminated Land under Part 2A EPA 1990	No records found
Control of Major Accident Hazards (COMAH)	1 record found: 475m S. Historical NIHHS Site.
Regulated explosive sites	No records found
Hazardous substance storage/usage	No records found
Historic IPC Authorisations	No records found
Part A (1) Licensed industrial activities	12 records found. Nearest: 439m S. Process: Surface Treating Metals And Plastics; Electrolytic/Chemical >30 Cu M. Effective date: 28/02/2005
Licensed pollutant release (Part A(2)/B)	No records found
Radioactive Substances Authorisations	No records found
Licensed Discharges to controlled waters	3 records found. Nearest: 436m SE. Sewage Discharges - Sewer Storm Overflow – Water Company.
Pollutant release to surface waters (Red List)	No records found
Pollutant release to public sewer	No records found
List 1 Dangerous Substances	No records found
List 2 Dangerous Substances	No records found
Pollution Incidents	9 records found. Nearest: 90m NW. Pollutant Description: Other Contaminated Water. Water Impact: Category 3 (Minor) Land Impact: Category 3 (Minor)
Pollution inventory substances	1 record found: 454m NW. Activity: Disposal Or Recovery Of Hazardous Waste With A Capacity Exceeding 10 Tonnes Per Day Involving Physico-Chemical Treatment
Pollution inventory waste transfers	1 record found: 454m NW. Activity: Disposal Or Recovery Of Hazardous Waste With A Capacity Exceeding 10 Tonnes Per Day Involving Physico-Chemical Treatment
Pollution inventory radioactive waste	No records found

6.0 Walkover survey and other information

The walkover survey was carried out on 29th April 2021. The site was observed to comprise a commercial property consistent with mapping that has the appearance of an early 20th century building. The basement had a concrete floor throughout in good condition. Basement uses included recording studios, a bike store, plant room and lift room. No staining was observed to be present.

Commercial and retail premises were present to the east. The easterly part of the block on which the site was located was in use as a car wash.

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7.0 Preliminary Conceptual Site Model

7.1 Introduction

To enable risks from contamination in soils to be assessed, a preliminary conceptual site model (CSM) has been developed. This is based on documentary data sources such as site history, contemporary land use data, landfill records, geological mapping and hydrogeological/hydrological data.

The CSM allows the identification of potential pollution linkages and comprises the following three elements:

Source - Potential contaminants associated with former and current land use.

Receptor – who or what could be affected. May include site users, the water environment. Ecosystems and construction or building materials including services.

Pathway – How the receptor may be exposed to the source.

A pollution linkage is only considered to exist if all three elements are present. If a pollution linkage exists, then further assessment may be necessary.

7.2 Potential Sources of Contamination

Historical show the site initially as being part of a brewery. This is no longer shown as present from 1903 mapping with a building present on the site conforming to the size and layout of the current site, although divided into individual contiguous units. The area to the east which now forms the same block bounded by Easton Road to the north, Lawrence Hill to the south and Lawrence Hill Roundabout to the East, undergoes development from 1918 mapping. Thus, due to the demolition and reconstruction that has taken place there is some potential for made ground to be present. However, due to the present of a basement and construction of a building within the original footprint, this is less likely than on a site with for example shallow stirp foundations and areas of open space which is absent here. If made ground was present, then there is some potential for elevated concentrations of heavy metals, PAH compounds and asbestos in site soils. A number of industrial uses are shown on historical mapping in the general area of the site that mainly comprise engineering works. Due to the presence of building footprint on the study site predating these activities, disposal of waste is not considered a likely source of contamination in site soils. These facilities may have used solvents for cleaning purposes on metals, but the quantities utilised would make it unlikely that sufficient source would be present to impact the study site via migration through soils. Similarly, impacts as a consequence of vapour migration are considered to be unlikely.

There is some evidence of bomb damage to the south west, but this does not appear to have impacted the site. Geological mapping does not indicate records of superficial deposits in the immediate and soils, if present are likely to be shallow and overlie sandstone bedrock. Therefore, movement of bombs away from target area via soils as the result of a J curve is an unlikely scenario. Unexploded ordnance is considered to be unlikely to be present and as no excavation works are planned, risks are considered to be negligible.

7.3 Preliminary Risk Assessment

In developing the conceptual model, it is critical that not just the source of any potential contamination is assessed but also potential receptors and pathways. The future use of the site may introduce new pathways to any contaminants that may be present. A change in use of the site may also introduce human receptors to different exposure scenarios.

The use of risk assessment methodologies such as CLEA allows assessments to be made of whether concentrations of potential contaminants exceed a particular guideline value. The

exceedance of a particular guideline value does not however, in itself enable an evaluation to be made of whether or not the subsequent risk posed to receptors is acceptable.

The risks from a particular pollutant linkage should therefore be evaluated to enable a determination of whether or not the risks are acceptable. This requires classification of:

The magnitude of the severity of the risk occurring (Table 7-1)

The magnitude of the likelihood of the risk occurring (Table 7-2)

Classification	Definition
Severe	Short term risk to human health which is likely to result in 'significant harm' as defined by the Environmental Protection Act 1990, Part IIA. Short term risk of pollution of sensitive water resources. Catastrophic damage to buildings/property. A short-term risk to a particular ecosystem, or organism forming part of such an organism
Medium	Chronic damage to Human Health. Pollution of sensitive water resources. A significant change in a particular ecosystem, or organism forming part of such ecosystem.
Mild	Pollution of non-sensitive water resources. Significant damage to crops, buildings, structures and services. Damage to sensitive buildings/structures/services or the environment
Minor	Harm, although not necessarily significant harm, which may result in a financial loss, or expenditure to resolve. Non-permanent effects to human health which may easily be prevented by measures such as personal protective clothing, etc. Easily repairable effects of damage to buildings, structures and services

Table 7-1: Classification of severity of risk after CIRIA 552

Classification	Definition
High Likelihood	There is a pollution linkage and an event that either appears very likely in the short term and almost inevitable over the long term or there is evidence at the receptor of harm or pollution.
Likely	There is a pollution linkage and all the elements are present and in the right place, which means that it is probable that an event will occur. Circumstances are such that an event is not inevitable, but possible in the short term and likely over the long term.
Low likelihood	There is a pollution linkage and circumstances are possible under which an event could occur. However, it is by no means certain that even over a longer period such an event would take place, and is less likely in the shorter term
Unlikely	There is a pollution linkage, but circumstances are such that it is improbable that an event would occur even in the very long term.

Table 7-2: Classification of likelihood of risk after CIRIA 552

To evaluate the risk that each pollutant linkage present on the site poses to a specified receptor, the classifications from each table are compared. It is important that this is only applied where the possibility of an existing pollutant linkage exists. This enables a risk category to be produced that range from 'very high risk' to 'very low risk' (Table 7-3.)

		Consequence			
		Severe	Medium	Mild	Minor
Likelihood	High Likelihood	Very High Risk	High Risk	Moderate risk	Moderate/low risk
	Likely	High Risk	Moderate Risk	Moderate/ low risk	Low risk
	Low likelihood	Moderate risk	Moderate/ low risk	Low risk	Very low risk
	Unlikely	Moderate/ low risk	Low risk	Very low risk	Very low risk

Table 7-3: Comparison of consequence with likelihood of risk occurring, after CIRIA 552.

The classification gives a guide to the severity and consequence of risks that have been identified at the site. It is not possible to classify a risk that has been identified as presenting 'no risk'. 'Very low risk' is the lowest risk ranking classification. Whether action is required depends on how acceptable the stakeholder views that risk as being. Table 7-4 shows the action required for specific risk classifications.

Risk classification	Action
Very high risk	A high probability that severe harm could arise to a specified receptor from an identified hazard OR there is evidence that severe harm is currently happening. If the risk is realised it is likely to result in substantial liability If not already undertaken, urgent investigation is required, and remediation measures are likely to be required.
High risk	Harm is likely to arise to a specified receptor from an identified hazard. Realisation of the risk is likely to present a substantial liability. If not already undertaken, urgent investigation is required, and remedial works may be necessary in the short term and are likely over the longer term.
Moderate risk	It is possible that harm could arise to a specified receptor from an identified hazard. It is relatively unlikely that any such harm would be severe or if any harm were to occur it is more likely that the harm would be relatively mild. If not already undertaken, investigation is normally required to clarify the risk and determine potential liability. Some remedial works may be required in the longer term.
Low risk	It is possible that harm could arise to a designated receptor from an identified hazard, but it is likely that this harm, if realised, would at worst normally be mild
Very low risk	There is a low possibility that harm could arise to a receptor. In the event of such harm being realised it is not likely to be severe.

Table 7-4: Description of the classified risks and likely action required after CIRIA 552.

As discussed in the previous section, there is the potential for heavy metals, PAH compounds and asbestos to be present in site soils. However, building footprint is present throughout and as the relevant pathways involve ingestion, dermal absorption and dust inhalation, these pathways are not considered to be present.

Therefore, risks to site users are considered to be **NEGLIGIBLE**.

Because of the aquifer status, lack of infiltration and anticipated low mobility of the contaminants of concern risks to controlled waters are considered to be **NEGLIGIBLE**.

7.4 Ground Gas

No landfill sites are shown within 250m of the study site. Infilled ground is not indicated in the vicinity of the site. The graveyard to the west associated with Holy Trinity Church (now the Trinity Centre) is understood to have had remains removed following deconsecration and is therefore not considered to be a source of ground gas.

7.5 Mining

The site is classified as being in a coal mining area. However, no excavation works or new builds is planned on the site.

8.0 Conclusions and Recommendations

The review of documentary information indicates that there is a **NEGLIGIBLE** risk to human health and to controlled waters. No ground gas sources have been identified.

All site investigations carried out in the UK should follow the principles set out in LCRM. This specifies that a phased approach should be used with a desk top study carried out in the first instant in all cases. Where this does not indicate the potential for a pollutant linkage, there is not considered to be a requirement for further stages such as intrusive investigations that involve the physical sampling of soils⁴.

There are no recommendations for further investigative works.

Should during any works on the site, evidence of contamination become apparent, this should be reported to the Local Authority contaminated land officer.

9.0 Statement of Limitations

This document has been prepared for the titled project or named part thereof and should not be relied upon or used for any other project, without an independent check being carried out as to its suitability, and prior written authority of Wesson Environmental being obtained. This document can be relied upon by Landrose Ltd. Wesson Environmental accepts no responsibility or liability for the consequences of this document being used for any purpose other than the purpose for which it was commissioned. Any person using or relying on the document for such other purpose, agrees, and will by such use or reliance, be taken to confirm his acceptance, to indemnify Wesson Environmental for all loss or damage resulting therefrom. Wesson Environmental accepts no responsibility or liability for this document to any other party.

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10.0 References

1. Ordnance Survey Maps – Collated for Wesson Environmental by Groundsure. Ref: WES-7814288.
2. Groundsure Enviro and Geo Insight. Ref: WES-7814289.
3. Land contamination risk management (LCRM). 2020. Environment Agency.
4. RB17 – A pragmatic Approach to Ground Gas Risk Assessment (2012). CL: AIRE.
5. Wilson and Card 2011. A pragmatic approach to ground gas risk assessment for the 21st Century. EPG Group Limited.

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APPENDIX A

Figures

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Figure 1. The site from the west.



Figure 2. The plant room in the basement



Figure 3. Control room in basement

APPENDIX B
Historical Maps

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APPENDIX C
Environmental Reports

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