



PHASE 1 SITE INVESTIGATION

Air Balloon Road

For

Moosehead Ltd

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Prepared by

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Contaminated Land Solutions

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



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8th September 2020

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 Air Balloon Road.

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 residential development:

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 363082 173427 and covers an area of 0.04ha.

Current Site Use:

The site currently comprises a triangular overgrown parcel of land adjacent to residential properties.

Site Boundaries:

Roads are present to the north and south with residential properties to the east.

Surrounding Site Use:

The surrounding area is predominantly residential.

Storage Tanks:

No tanks are present on the study site.

3.0 Site History

Historical maps have been procured from the Ordnance Survey, which show development of the site and its surrounding area from 1883 – 2019.

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 western part of the site is vacant. The eastern part of the site has residential properties present.	1883	1:2500	Residential properties are present in the wider area with farmland present. An old quarry is present 230m to the south east and 230m to the east.
	1904	1:2500	The road to the south is shown with tram tracks present. A boot and shoe works is shown 100m to the west.
	1918	1:2500	A boot factory is located approximately 10m to the north on the other side of Hillside Road. The boot and shoe works to the west is no longer shown. The quarry to the east is no longer shown.
A small building is shown on the western part of the site.	1949	1:2500	An electricity substation is shown 10m to the north. An additional building is present on the southern part of the boot factory site. An allotment garden is shown 90m to the south west and to the north of the boot factory. Buildings 10m to the south east are no longer present.
The building on the west of the site is no longer present.	1956	1:1250	The boot factory to the north is shown as an engineering drawing office with further buildings on the southern part of the site. An engineering works is shown 50m to the south east.
The buildings on the east of the site are no longer present	1964	1:1250	The engineering drawing office is shown as a warehouse with a single large building on the southern part of the site. The old quarry to the south east is no longer shown with residential development having occurred in this location.
	1968	1:1250	A transport depot is present 90m to the north west. Further buildings are present on the south of the warehouse site. A garage is present 110m to the west.
	1989	1:1250	The Transport depot to the west is no longer shown.
	2003	1:1250	The warehouse to the north is no longer present with a health centre and nursing home in its place.

3.1 Areas of Disturbed Ground

No disturbed ground is apparent on historical mapping.

3.2 Intended Site Use

A residential development is intended on the study site.

3.3 Historical Industrial sites

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

87 records found within 500m. Nearest:
203m S. Unspecified Pit. Date: 1955.

3.3.2 Historical Tank Database

11 records found. Nearest:
286m SE. Unspecified tank. Date: 1883.

3.3.3 Historical Energy Features Database

25 records found. Nearest:
8m N. Electricity substation. Dates: 1949-1990.

3.3.4 Historical Petrol and Fuel Site Database

1 record found:
315m N. Filling station. Date: 1991

3.3.5 Historical Garages

12 records found. Nearest:
106m W. Garage. Dates: 1968-1969.

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:

4 records within 500m. The nearest is located 101m to the south west and refers to Infilled ground.

Superficial Geology:

No superficial deposits are shown underlying the study site.

Bedrock/solid geology:

Bedrock is shown as Sandstone of the Downend Member. Fracture flow is present, and permeability is classified as Moderate to High.

4.1.1 Man Made/ Induced Hazards

Hazard	Records
Natural cavities	No records found.
Brit Pits (Currently active and closed surface and underground mineral workings)	7 records found. Nearest: 37m S. Commodity: Coal: Deep. Ceased.
Surface ground workings	28 records found: 203m S. Unspecified Pit. Year: 1955.
Underground workings	3 records found. Nearest: 941m N. Date: 1938.
Historical Mineral Planning Areas	No records found.
Non-coal mining	1 record found: 35m N. Iron Ore (bedded). Localised small scale underground mining may have occurred. Potential for difficult ground conditions are unlikely or localised and are at a level where they need not be considered
Mining Cavities	No records found.
Coal Mining	The site is located within a coal mining area as defined by the Coal Authority.
Brine extraction	No records found
Gypsum extraction	No records found
Tin Mining	No records found
Clay mining	No records found
Cornwall and Devon Metalliferous Mining	No records found

4.1.2 *Natural Hazards*

Hazard	Risk
Shrinking/Swelling clay	Very Low
Running Sand	Negligible
Compressible deposits	Negligible
Collapsible deposits	Very Low
Landslides	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

5.1.1 *Groundwater*

The bedrock is classified as a Secondary A Aquifer. This refers to 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.

5.1.2 *Soil Vulnerability*

Soils are classified as being low leaching class with an infiltration value of <40% and a dilution factor of 300-500mm/year.

5.1.3 *Surface and Groundwater Abstraction Points*

No groundwater abstractions are shown within 1000m.

No surface water abstractions are shown within 1000m.

There are no potable water abstractions within 1000m.

5.1.1 *Source Protection Zones*

No Source Protection Zones are shown within 500m.

5.1.1 *Surface water*

There are no records within 250m of the study site.

5.1.2 *Flood Risk:*

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

5.1.3 *Surface Water Flooding*

There are no risk of flooding from rivers and the sea (RoFRaS) records within 50m of the study site.

5.1.4 *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)	1 record found: 221m S. Troopers Hill.
Ancient Woodland	1 record found: 925m S. Name: unknown. Ancient & Semi-Natural Woodland
Biosphere Reserves	No records found
Forest Parks	No records found
Marine Conservation Zones	No records found
Green Belt	1 record found: 789m S. Name: Bath and Bristol.
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
Conservation Areas	1 record found: 220m S. Avon Valley.
Scheduled Ancient Monuments	No records found
Registered parks and gardens	No records found

5.3 Landfill and Other Waste Sites

Records Searched:	Details
Active or recent landfill	No data found
Historical landfill (BGS records)	No data found
Local Authority and Mapping Records	No data found
Historical Landfills from EA/NRW	1 record found: 289-290m SW. Refuse Tip. 1968 mapping.
Historical waste sites	1 record found: 350m S. Type of site: refuse. Date: 1938
Licensed waste sites	No data found
Waste exemptions	2 records found: 31m N. Treating waste exemption. Sorting and de-naturing of controlled drugs for disposal.

5.4 Current Land Use

There are 4 Contemporary Trade Directory Entries recorded within 250m of the study site:

18m N, 50m S, 220m S. Electricity Sub Station.

25m S. Vehicle Repair, Testing and Servicing.

5.5 Petrol and Fuel Sites

2 records found within 1000m:

317m N. Open.

450 NW. 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)	No records found
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	No records found
Licensed pollutant release (Part A(2)/B)	1 record found: 332m N. Process: Unloading of Petrol into Storage at Service Stations
Radioactive Substances Authorisations	No records found
Licensed Discharges to controlled waters	7 records found. Nearest: 186m NE. 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	2 records found. Nearest: 286m W. Pollutant Description: Kerosene and Aviation Fuel. No impacts to any environmental media.
Pollution inventory substances	No records found
Pollution inventory waste transfers	No records found
Pollution inventory radioactive waste	No records found

6.0 Walkover survey and other information

A walkover survey was carried out on 25th June 2020. The site was observed to be a cleared area that was largely overgrown with some areas of bare ground. Frequent building rubble was present on the site. The bare soils were observed to have masonry fragments present with some clinker and wood. Evidence of boreholes were observed from a previous investigation. A concrete pad with an electricity cable was present on the western side of the site. No tanks or staining were observed on the site and no evidence of vegetation stress was present.

The site sloped to the north with the northern part exhibiting a steep slope to the road. A retaining wall was present on the southern part of the site, with the drop to the road varying between 0.5m to the west and 1.5m to the east. The road to the north exhibited an upward slope in an easterly direction whilst the road to the south exhibited an upward slope in a westerly direction. Houses were present immediately to the east of the site and the area was largely residential with the exception of a doctor's surgery to the north of Hillside Road and a car repair garage to the south of Air Balloon Road.

7.0 Risk Assessment

7.1 Potential Sources of Contamination

Historical records indicate that the western part of the site has always been vacant with the exception of a small building that was present on the 1949 mapping, which was no longer shown on 1956 mapping. The eastern side of the site had residential properties present which were no longer present from 1964 mapping onwards. This is consistent with the observation of rubble on the site in shallow soils along with clinker. Consequently, there is the potential for heavy metals and polycyclic aromatic hydrocarbon (PAH) compounds to be present in site soils. Due to the presence of building rubble, the presence of asbestos in the site soils cannot be ruled out. Whilst no asbestos containing materials were observed during the walkover survey, it was not possible to examine all of the soils in detail and if present as fibres these may not be visible upon initial inspection.

A boot and shoe factory is shown to the north of Hillside Road from 1918 mapping onward with the works itself located set back to the north. This is shown as an engineering drawing office from 1956 onwards and as warehousing from 1964. From the early 20th century adhesives were used in shoe manufacture and these would have comprised acetone, celluloid and oxalic acid initially with other formulations being used later on in the 20th century. However, these would not have been produced on the site and impacts to soils from compounds such as acetone are expected to be minimal as they would have been present in the matrix of the adhesive which would have 'set' on exposure to the air within a relatively short time, thus impeding the potential to enter soils.

7.2 Preliminary Conceptual Model

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.

As discussed in section 7.1, the potential for the presence of heavy metals, PAH compounds and asbestos cannot be ruled out. If present pathways will include those involving ingestion, dermal contact and dust inhalation. Vapour intrusion pathways are not expected to be present. However, as shown in figure 4, the proposed site layout includes minimal soft landscaped areas. The area shown as a planting bed on the western part of the site will be a raised area and will therefore mitigate the pathways discussed. There are two grass/planting area on the eastern part of the site. The northern one is to be located in an area that will be excavated for slope stability purposes with clean soil bought in to infill the excavation. The southern of the two areas will be located where a tank is to be located for surface water drainage control. Again, any soils emplaced following the installation of the tank will be imported clean materials. Consequently, the proposed site layout will remove the proposed pathways and there is therefore not considered to be a pollution linkage present.

Therefore, risks to human health are considered to be **NEGLIGIBLE**.

The site is shown as being underlain by a Secondary A Aquifer. The contaminants of concern are likely to demonstrate a low aqueous solubility. No surface water records or ground water abstractions are shown within the specified search distance.

Risks to controlled waters are therefore considered to be **NEGLIGIBLE**.

7.3 Ground gas

No landfills or infilled ground is indicated within 250m. Therefore, risks from ground gas are considered to be **NEGLIBLE**.

7.4 Mining

The site is located within a coal mining area as defined by the Coal Authority. A coal mining report has been issued separately by Bristol Coalmining Archive.

8.0 Conclusions and Recommendations

The review of documentary information indicates that there is a NEGLIGIBLE risk to human health and to controlled waters. Risks from ground gas are considered to be NEGLIGIBLE.

All site investigations carried out in the UK should follow the principles set out in CLR11. 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.

Where soft landscaping is to be present in the form of planters, turfed areas etc a minimum depth of 600mm of clean imported soil should be emplaced. Depths and chemical analysis of imported soils should be confirmed and where materials are disposed of off-site, waste transfer notes should be retained.

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 Moosehead 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.

10.0 References

1. Ordnance Survey Maps – Collated for Wesson Environmental by Groundsure. Ref: WES-6830802.
2. Groundsure Enviro and Geo Insight. Ref: WES-6830803.
4. Model procedures for the management of land contamination (CLR11) 2004. Environment Agency

APPENDIX A

Figures



Figure 1. Looking west showing rubble, with a borehole in the foreground.



Figure 2. Looking east towards the adjacent housing.



Figure 3. Concrete plinth and electricity cable on west of site.

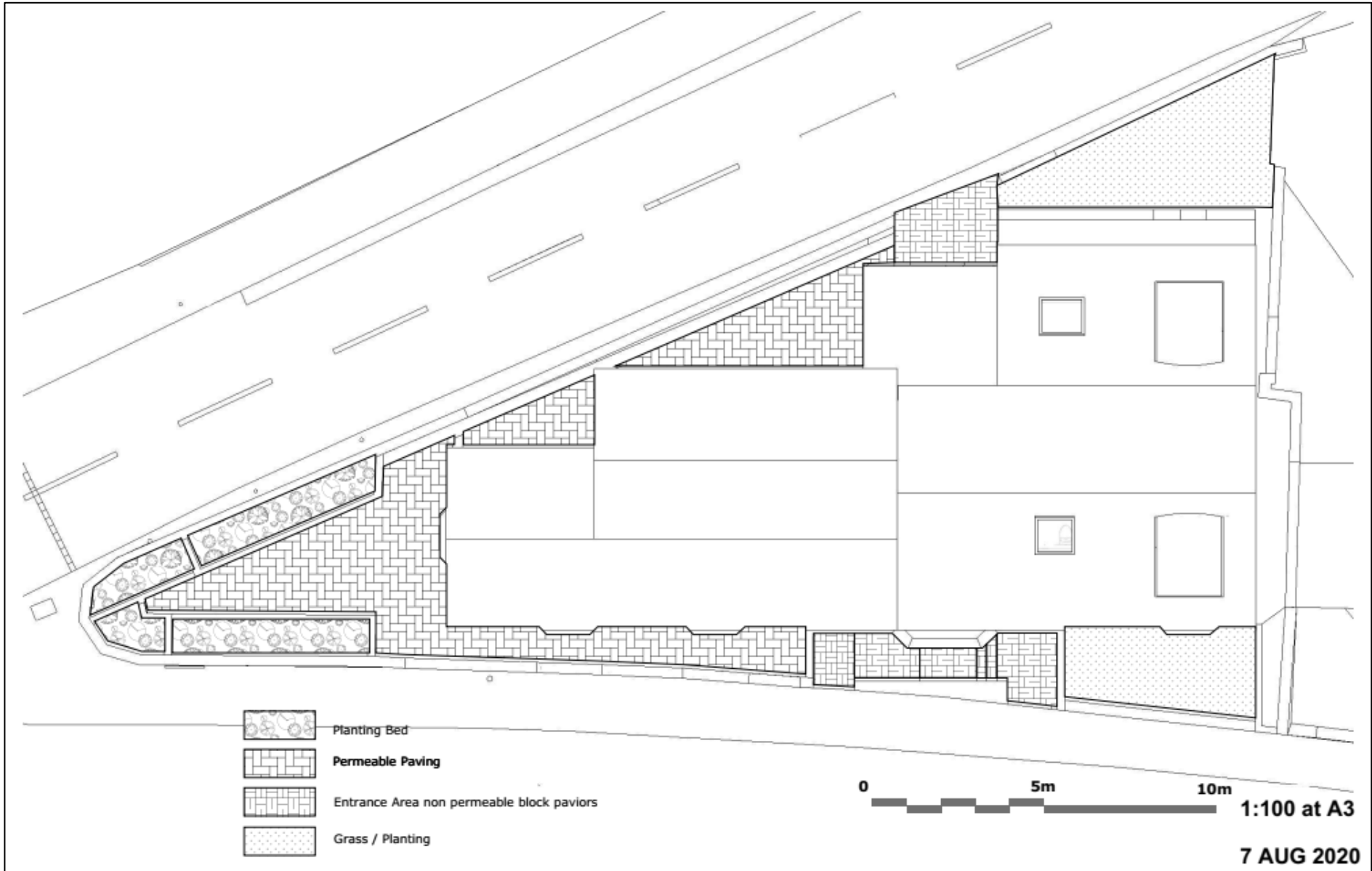


Figure 4. Proposed site layout.

APPENDIX B
Historical Maps

APPENDIX C
Environmental Reports