Wesson Environmental

Contaminated Land Solutions

PHASE 1 SITE INVESTIGATION

73a, Maygrove Road, NW6

For

Contractual Limited

July 2019

Project No. 001CONTP1

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
Environmental Consultant

Date

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APPENDICES

1.0 Introduction

1.1 General

Wesson Environmental were commissioned to carry out a Phase 1 Site Investigation of the site located at 73a, Maygrove Road, NW6.

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 525029,184793 and covers an area of approximately 0.1ha.

Current Site Use:

The site consists of land associated with offices and residential properties.

Site Boundaries:

The site is bordered to the north by residential properties, to the east by a school, to the south by a road and to the west by a park.

Surrounding Site Use:

The surrounding area is predominantly residential.

Storage Tanks:

No storage 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 1871-2014.

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 of Map	Surrounding Area
The site is shown on what appears to be an embankment.	1871	A railway siding is shown 20m to the north. A railway cutting is shown 150m to the south.
A building is shown on the site that appears to be associated with the railway sidings	1896	Buildings are shown immediately to the north west and east of the site that appear to be associated with the railway sidings. Residential properties are shown to the south of Maygrove Road which is now shown to the south of the site. A viaduct is present in addition to the cutting to the south.
The building is no longer present on the site.	1915	
	1935	The building immediately to the north west is shown as a garage with a coal depot to the west of this. Garages, which appear to be domestic are present to the east of the site. A buildings yard is present 50m to the west with a substation to the west of this. A woodturning works is present to the west of the substation. A garage, that appears to be a filling station is present 120m to the west of the site.
A button factory is shown on the site.	1974	
The site is no longer shown as a button factory.	1985	The sidings are no longer shown. Residential units are shown to the east. The garages to the east are no longer shown with a building shown in its place that may be residential.

3.1 Areas of Disturbed Ground

There is no indication of filled ground on the site or in the immediately surrounding area.

3.2 Intended Site Use

A residential property is planned on the study site.

3.1 Historical Industrial sites

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

137 records found within 500m. Nearest:
On-site-33m NW. Railway sidings. Dates: 1894-1973.
On-site-42m North west. Railway buildings. 1894-1968
On-site. Unspecified ground workings. 1866-1973
10m E. Coal depot.

3.1.2 Historical Tank Database

13 records found. Nearest:
247m E. Unspecified tank. Date: 1915.

3.1.3 Historical Energy Features Database

90 records found. Nearest:
66m W. Electricity Substation. Date: 1955.

3.1.4 Historical Petrol and Fuel Site Database

No records found

3.1.5 Historical Garage and Motor Vehicle Repair Database

69 records found. All:
On-site. Garage. 1953-1955.

3.1.6 Potentially Infilled Land

42 records found. Nearest:
On-site. Unspecified ground workings. Dates: 1866-1973.

4.0 Geological Setting

4.1 Geology

Current geological maps of the region[2] have been consulted to provide information on geological conditions associated with the site.

Artificial/Made Ground:
No records of artificial/made ground are shown within 500m.

Superficial Geology:
No superficial deposits are shown underlying the study site.

Bedrock/solid geology:
Bedrock is shown as clay, silt and sand of the London Clay Formation. Mixed flow is present, and permeability is classified as very low to moderate.

4.1.1 Man Made/ Induced Hazards

Hazard	Risk
Historical Mining	No data found.
Coal Mining	No data found.
Non-coal mining	No data found.
Non-coal mining cavities	No data found.
Natural cavities	No data found.
Brine extraction	No data found.
Gypsum extraction	No data found.
Tin Mining	No data found.
Clay mining	No data found.

4.1.2 Natural Hazards

Hazard	Risk
Shrinking/Swelling clay	Moderate
Landslides	Very Low
Ground Dissolution	Negligible
Compressible deposits	Negligible
Collapsible deposits	Very Low
Running Sand	Very Low
Radon	The property is not in a Radon Affected Area, as 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:

The bedrock is classified as a Unproductive. These are rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow.

Vulnerability:

No data found.

Surface water:

No surface water features are recorded within the specified search distance.

Source Protection Zones:

No Source Protection Zones are shown within 1000m of the study site.

Surface and Groundwater Abstraction Points:

No groundwater or surface water abstractions are shown within 1000m of the study site.

No potable water abstractions are shown within 1000m of the study site.

Flood Risk:

No Environment Agency/Natural Resources Wales floodplains are shown within 250m of the study site.

Risk of flooding from rivers is classified as Very Low.

BGS Groundwater Flooding Data does not identify any groundwater flooding susceptibility area within 50m of the site boundary.

5.2 Sensitive Land Uses

Uses within 1km

Designation	Details
Sites of Special Scientific Interest (SSSI)	No records found
National Nature Reserves (NNR)	No records found
Special Areas of Conservation (SAC)	No records found
Special Protection Areas (SPA)	No records found
Ramsar sites	No records found
Ancient Woodland	No records found
Local Nature Reserves (LNR)	2 records found. Both: 706m NW. Westbere Copse.
World Heritage Sites	No records found
Environmentally Sensitive Areas	No records found
Areas of Outstanding Natural Beauty (AONB)	No records found
National Parks (NP)	No records found
Nitrate Sensitive Areas	No records found
Nitrate Vulnerable Zones (NVZ)	No records found
Areas of Green Belt	No records found

5.3 Landfill and Other Waste Sites

Uses within 1km

Records Searched:	Details
Environment Agency/Natural Resources Wales landfill data	No records found
Environment Agency/Natural Resources Wales Historical Landfill Sites	1 record found: 969m E. Waste type: N/A. Last recorded: N/A.
BGS/DoE non-operational landfill sites	1 record found: 978m N. Waste type: N/A
Local Authority Recorded Landfill Sites	No records found
Waste Treatment or Disposal Sites	2 records found: On-site. Scrap metal yard. Date: 1973 169m E. Car breakers yard. Date: 1973.
Environment Agency/Natural Resources Wales licensed waste sites	No records found

5.4 Current Land Use

There are 14 Contemporary Trade Directory Entries recorded within 250m of the study site, 2 of which are located within 100m of the study site:

78m SW. Recording Studios and Record Companies.
87m W. Unspecified Works or Factories

Full details are contained in Appendix C.

5.5 Petrol and Fuel Sites

1 record found within 1000m:
405m SW. Status: Open.

5.6 National Grid High Voltage Underground Electricity Transmission Cables

2 records found:
376m SW. Cable Type: A/C. Operating Voltage (kV): 400
393m W. Cable Type: A/C. Operating Voltage (kV): 400

5.7 Underground Gas Pipelines

No records found

5.8 Environmental permits, Incidents and Registers

Industrial Sites Holding Licences/ Authorisations:	**Records Held:**
Historic IPC Authorisations	No records found
Part A (1) and IPPC Authorised Activities	No records found
Red List Discharge Consents	No records found
List 1 Dangerous Substances Inventory Sites	No records found
List 2 Dangerous Substance Inventory Sites	No records found
Records of Part A (2) and Part B Activities and Enforcements	8 records found. Nearest: 175m S. Process: Respraying of Road Vehicles
Category 3 or 4 Radioactive Substances Authorisations:	No records found
Licensed Discharge Consents	No records found
Water Industry Referrals	No records found
Planning Hazardous Substance Consents and Enforcements	No records found
Dangerous or Hazardous Sites	No records found
Recorded Pollution Incidents List 2	2 records found: 157m S. Pollutant Description: Household Waste. Land Impact: Category 3 (Minor) 339m W. Pollutant Description: Firefighting Run Off. Land Impact: Category 2 (Significant)
Recorded Pollution Incidents List 1	No records found
Sites Determined as Contaminated Land under Part 2A EPA 1990	No records found

6.0 Walkover survey and other information

The site walkover survey was conducted on the 17th June 2019. The site was observed to comprise a car park area with hard standing comprising brick paviers. Minimal staining was observed on the car park surface and no tanks were present. A small pile of rubbish was present on part of the car parking area comprising wood, plastic and Terram geotextile. The buildings that were immediately abut the application site were observed to be mixed residential and offices. The surround area was residential.

7.0 Risk Assessment

7.1 Potential Sources of Contamination

Historical records indicate that the site was present on land that was associated with railway sidings. The sidings were no longer shown from 1985 mapping. Various changes occurred on the site with it being shown as a button factory from 1974. This date also appears to coincide with a scrap metal yard being present on the site. The building itself appear to have been the button factory and the scrap metal yard is shown as land that coincides with the north eastern corner of the site extending off site to the north and east. The nature of the button factory is not known but contamination on similar sites has included volatile organic carbon (VOC) compounds such as trichloroethylene, Cis 1,2 dichloroethene and tetrachloroethylene. If coating of metal buttons had occurred, there is the potential for cadmium and chromium to be present. The situation of the site adjacent to railway sidings also has potential to introduce contaminants such as heavy metals and polycyclic aromatic hydrocarbon compounds (PAH)

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 6.1, the potential for the presence of heavy metals, PAH compounds, and VOC compounds to be present in site soils cannot be ruled out. This site plans indicate that building footprint and hardstanding will be present throughout the site. Therefore, in the case of contaminants such as heavy metals and PAH compounds where a vapour phase is absent or negligible, then pathways such as direct contact with soils, ingestion of soils and homegrown produce, dust inhalation cannot be said to be present. In the case of VOC compounds, a vapour phase is considered to be present (Table 7-1).

Potential Contaminant Sources	Associated contaminants	Human Health Pathways	Plausible Contaminant Linkage	
Button Factory Railway land	Heavy metals, PAH	Direct Contact with the soil. Inhalation of dusts and soils	No - hardstanding and building footprint present throughout.	✘
Button factory	VOC compounds	Direct Contact with the soil. Inhalation of dusts and soils Vapour intrusion	Vapour intrusion pathways potentially present in future developments	✓

Table 7-1. Plausible pollution linkages

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 7-2)
The magnitude of the likelihood of the risk occurring (Table 7-3)

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 7-2: 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 7-3: 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 7-4.)

		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 7-4: 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 7-5 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 7-5: Description of the classified risks and likely action required after CIRIA 552

A tabular conceptual site model based on the above methodology is presented below. The likelihood assigned to vapour intrusion from TPH compounds is lower which reflects the species that are anticipated to be present.

Source	Pathway	Receptor	Severity	Likelihood	Consequence / likelihood
VOC	Ingestion of soils including attached to vegetables	Site Users	Medium	Unlikely	Low risk
	Consumption of home grown produce		Medium	Unlikely	Low risk
	Dermal contact		Medium	Unlikely	Low risk
	Dust inhalation - indoor		Medium	Unlikely	Low risk
	Dust Inhalation - outdoor		Medium	Unlikely	Low risk
	Vapour intrusion		Medium	Likely	Moderate Risk

Table 7-6. Tabular conceptual model. Human health.

Risks to human health are therefore considered to be **MODERATE.**

In the case of controlled waters, the underlying bedrock is shown as an unproductive aquifer with no surface water or abstractions within the relevant search distance. Therefore, risks to controlled waters are considered to be **NEGLIGIBLE.**

7.3 Ground gas

No landfill sites are shown within 250m of the study site. Whilst the earliest mapping shows an embankment which is a consistent feature on mapping until the presence of the current building, we would consider that the potential for putrescible materials to be present in this location to be low as this appears to be more of an engineered feature than a consequence of waste disposal. Furthermore, the amount of time that this feature has been present indicates that it is unlikely that viable putrescible materials are still undergoing methanogenesis. Therefore, risks from ground gas are considered to be **NEGLIGIBLE**.

7.4 Mining

The records indicate that the site is unlikely to be impacted by mining.

8.0 Conclusions and Recommendations

The review of documentary information indicates that there is a MODERATE risk to human health and a NEGLIGIBLE risk 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 soils[4].

An intrusive investigation should be carried to characterise site soils and determine the presence and concentration of contaminants discussed in section 7.

In addition, a coal mining report should be obtained. All investigative measures should be agreed with the local authority prior to commencement.

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 Contractual Limited. 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: GS-GS-6130092.
2. Groundsure Enviro Insight Report ref: GS-6130090
3. Groundsure Geo Insight Report Ref: GS-6130091
4. Model procedures for the management of land contamination (CLR11) 2004. Environment Agency

Appendix A

Figures

Figure 1. Car parking area on the eastern part of the site showing waste as described in the text

Figure 2. Looking south east on the site.

Figure 3. Looking east on the site.

APPENDIX B

Historical Maps

APPENDIX C

Environmental Reports