

Wesson Environmental

Contaminated Land Solutions

PHASE 1 SITE INVESTIGATION

75A, Bridge Road, Uxbridge

For

J&J Transport

December 2022

Project No. 001AJTP1

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

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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 75A, Bridge Road, Uxbridge.

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 properties:

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 505338 183386 and covers an area of approximately 0.03 ha.

Current Site Use:

The site comprises a former workshop and associated land .

Site Boundaries:

The site is bounded by residential properties to the north and south. A river is present to the east and a road to the west.

Surrounding Site Use:

The surrounding area is predominantly residential.

Storage Tanks:

No storage tanks are present on 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 1866 - 2022.

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 is located on what is assumed to be agricultural land.	1866	1:2500	A river is present to the east. Gravel pits are shown approximately 110m to the north east and 130m to the south east.. An excavated area is present 30m to the east.
	1896	1:2500	The excavation to the east and the gravel pit to the south east are no longer shown. Residential development is evident in the wider area.
A building is evident on the site that conforms to that currently on site.	1914	1:2500	Residential properties are present to the north and south. Bridge Road is present to the west. The area as a whole has undergone residential development. The gravel pit to the north east is no longer shown. A gravel pit is shown 90m to the south east.
	1934	1:250	The gravel pit to the south east is no longer shown.
The building on site is labelled as a works.	1963	1:1250	A works is present 180m to the south west of the site.

3.1 Areas of Disturbed Ground

Excavations and gravel pits are shown on mapping until the early 20th century.

3.2 Intended Site Use

A residential property is planned on the site.

3.3 Historical Industrial sites

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

175 records found within 500m. Nearest:

On site. Unspecified works. Date: 1970.

95-98m SE. Gravel pit. Date: 1913-1932.

3.3.2 Historical Tank Database

69 records found. Nearest:

210m SW. Gas holder station. Date: 1988-1992.

3.3.3 Historical Energy Features Database

49 records found. Nearest:

136m NW. Electricity substation. Date: 1976-1990.

3.3.4 Historical Petrol and Fuel Site Database

No records found.

3.3.5 Historical Garage and Motor Vehicle Repair Database

5 records found. Nearest:
197-198m S. Garage. Date: 1963-1992.

3.3.6 Historical military sites

No records found.

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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. Nearest:
116m NE. Worked Ground (Undivided).

Superficial Geology:

The site is shown as underlain by Alluvium, comprising Clay, Silt, Sand and Gravel. Intergranular flow is present and permeability is classified as very low to high.

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
Natural cavities	No records found.
BritPits	5 records found. Nearest: 172m SE. Commodity: Sand & Gravel. Surface mineral working. Status: Ceased.
Surface ground workings	15 records found. Nearest: 95-98m SE. Gravel pit. Date: 1913-1932.
Underground workings	No records found
Non-coal mining	1 record found: 62m E. Commodity: Chalk. Small scale underground mining may have occurred; mine adits, shafts and tunnels may be present. Potential for localised difficult ground conditions are at a level where they should be considered.
Mining cavities	No records found.
Coal Mining	No records found.
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	Very Low
Running Sand	Low
Compressible deposits	Moderate
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:

Superficial deposits are classified as a Secondary A Aquifer. These 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.

Bedrock is classified as Unproductive.

Groundwater Vulnerability:

An assessment of the vulnerability of groundwater to a pollutant discharged at ground level based on the hydrological, geological, hydrogeological and soil properties within a one-kilometre square grid. Groundwater vulnerability is described as High, Medium or Low as follows:

- High - Areas able to easily transmit pollution to groundwater. They are likely to be characterised by high leaching soils and the absence of low permeability superficial deposits.
- Medium - Intermediate between high and low vulnerability.
- Low - Areas that provide the greatest protection from pollution. They are likely to be characterised by low leaching soils and/or the presence of superficial deposits characterised by a low permeability.

The secondary superficial aquifer is classified as high vulnerability.

Soils are classified as high leaching class with an infiltration value of 40-70% and a dilution factor of 300-550mm/year.

5.1.1 Surface and Groundwater Abstraction Points

1 groundwater abstraction is shown within 1000m:

852m SW. Details: Process water.

No surface water abstractions are shown within 1000m.

No potable water abstractions are shown within 1000m.

5.1.2 Source Protection Zones

No records within 500m.

5.1.3 Surface water

3 water network records are shown within 250m. Nearest:

8m E. Name: Fray's River. Inland river not influenced by normal tidal action.

5.1.4 Surface Water Flooding

There are 2 Risk of Flooding from Rivers and The Sea (RoFRaS) records within 50m of the study site. The highest risk on site is classified as medium.

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

The site is located within a Zone 3 flood Plain. This covers land with a 1 in 100 or greater chance of flooding each year from rivers.

5.1.6 Groundwater flooding

The highest risk on site is classified as moderate.

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	The site is located within London Green Belt.
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	No records found
Historical waste sites	1 record found: 442m W. Type: Waste Transfer Station.
Licensed waste sites	No records found
Waste exemptions	3 records found. All: 67m SE. Treating waste exemption.

5.4 Current Land Use

There are 6 current potentially contaminative industrial sites within 250m of the study site:

On site. Works.

140m NW, 183m S, 197m SE. Electricity sub station.

226m S. Seals, Tapes, Taps and Valves.

230m N. Furniture.

Full details are contained in Appendix C.

5.5 Petrol and Fuel Sites

No records found:

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: 221m SW. 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	No records found
Licensed pollutant release (Part A(2)/B)	2 records found. Nearest: 373m SW. Process: Respraying of Road Vehicles.
Radioactive Substances Authorisations	No records found
Licensed Discharges to controlled waters	7 records found. Nearest: 117m N. Effluent Type: Miscellaneous Discharges – Unspecified. Receiving Water: River Frays.
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	4 records found. Nearest: 357m W. Pollutant Description: Soot/Smuts. Air Impact: Category 3 (Minor).
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

The site was visited 7th December 2022 to allow a visual inspection to take place. The site was observed to comprise a driveway to the front that access the former workshop to the rear via an archway. The driveway was surfaced with tarmac in poor condition with fracturing evident. This access the remainder of the site via an archway. The main part of the site had concrete surfacing present. This was in fair condition with some cracking evident and service entries present.

The building itself was largely brick built with slate roof and is understood to have been the manufacturer of aircraft seat frames. At the time of the visit, the original flooring of concrete had been broken up leaving rubble in its place. Building materials and planks of wood were evident. To the west of the building adjacent to the border with residential properties, domestic rubbish was present.

No tanks were observed, and there was no staining on surfaces.

Enquiries to the contaminated land team at Hillingdon Council identifies the presence of a works with signage indicating a business named Craftsman Springs, which is understood to have included manufacture of springs from a variety of metals.

7.0 Preliminary Conceptual Site Model

7.1 Introduction

To enable risks from contamination in soils, 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 records indicate that the site had been located on what is presumed to be agricultural land until the early 20th century when the area undergoes residential development. A building is shown on the site coinciding with the current workshop building, and based on its location and layout, it is likely to have been used for this purpose, although it is not explicitly labelled as a works until the 1963 mapping. Whilst information indicates it had most recently been used to manufacture aircraft seat frames and springs, a directory search indicates Craftsman Springs appears to have been incorporated in 2004. Consequently, other manufactories are likely to have been present that may have produced a range of items. Waste management practices are unlikely to have been as stringent as those currently in place, and therefore a range of contaminants have potential to be present on site, including heavy metals, polycyclic aromatic hydrocarbon compounds (PAH), petroleum hydrocarbon compounds (TPH) and volatile organic compounds. The presence of asbestos in soils can also not be ruled out where made ground is present, which may be the case when laying down hardstanding, with various materials previously thought of as inert used as 'sub base'.

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	<p>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.</p> <p>If the risk is realised it is likely to result in substantial liability</p> <p>If not already undertaken, urgent investigation is required, and remediation measures are likely to be required.</p>
High risk	<p>Harm is likely to arise to a specified receptor from an identified hazard.</p> <p>Realisation of the risk is likely to present a substantial liability.</p> <p>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.</p>
Moderate risk	<p>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.</p> <p>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.</p>
Low risk	<p>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</p>
Very low risk	<p>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.</p>

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

As discussed in the previous section, there is potential for a range of contaminants to be present due to previous site activities. The risk from contaminants in site soils will be dependent on actual site layout. We would assume that no soft landscaping will be present, as the layout of the site will not be amenable to this. Consequently, pathways involving direct contact with site soils, ingestion and dust inhalation are unlikely to be present. However, due to the potential for TPH and VOC compounds to be present, pathways involving vapour inhalation may exist.

Due to the presence of the Fray River, there is a potential for impacts to controlled waters. Due to the assumed presence of building footprint and hardstanding throughout, infiltration is likely to be minimal. Contaminants such as heavy metals and PAH compounds are likely to show low aqueous solubility. Consequently, the potential for these contaminants to undergo leaching is minimal. TPH and VOC compounds, if present, are likely to show greater mobility as a free phase and due to leaching, although the latter is likely to be attenuated due to the presence of building footprint and hardstanding. However, leaching of contaminants may occur due to the presence of groundwater in the wider area and the general hydrogeological regime is likely to exhibit a gradient towards the river.

A tabular conceptual model is present in Table 7-5.

7.4 Ground Gas

No landfill sites are shown within 250m of the site. Quarrying activity was shown to the east, north east and south east of the site, but this had ceased by the early 20th century. Furthermore, these areas subsequently underwent development and materials liable to demonstrate instability would have been removed. Consequently, it is considered unlikely that putrescible materials would remain in quantities sufficient to generate ground gas in sufficient quantity to impact the study site. Therefore, risks from ground gas is considered to be **NEGLIGIBLE**.

7.5 Mining

Non-coal mining is indicated to have the potential to have occurred 62m to the east of the site. However, these records appear to be from the east of the river, with no records to the west. Consequently, mining on the site is considered less likely to have occurred, especially given the proximity of the river.

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Source	Pathway	Receptor	Severity	Likelihood	Consequence/ likelihood	Justification
Heavy Metals, PAH,	Ingestion of soils including attached to vegetables	Site Users	Minor	Unlikely	Very Low Risk	Hardstanding/building footprint assumed throughout
	Consumption of home grown produce		Minor	Unlikely	Very Low Risk	
	Dermal contact		Minor	Unlikely	Very Low Risk	
	Dust inhalation - indoor		Minor	Unlikely	Very Low Risk	
	Dust Inhalation - outdoor		Minor	Unlikely	Very Low Risk	
Asbestos	Dust inhalation - indoor		Minor	Unlikely	Very Low Risk	Hardstanding/building footprint assumed throughout
	Dust Inhalation - outdoor		Minor	Unlikely	Very Low Risk	
VOC, SVOC	Ingestion of soils including attached to vegetables	Site Users	Minor	Unlikely	Very Low Risk	Vapour phase has potential to be present
	Consumption of home grown produce		Minor	Unlikely	Very Low Risk	
	Dermal contact		Minor	Unlikely	Very Low Risk	
	Dust inhalation - indoor		Minor	Unlikely	Very Low Risk	
	Dust Inhalation - outdoor		Minor	Unlikely	Very Low Risk	
	Vapour intrusion		Medium	Likely	Moderate Risk	
Heavy Metals, PAH	Leaching and lateral migration	Surface water	Minor	Unlikely	Very Low Risk	Limited infiltration will attenuate leaching
TPH, VOC	Leaching and lateral migration	Surface water	Medium	Low likelihood	Moderate/Low Risk	
TPH, VOC	Migration of free phase	Surface water	Medium	Likely	Moderate Risk	Free phase possible if contaminants present

Table 7-5. Tabular conceptual model.

8.0 Conclusions and Recommendations

The review of documentary information indicates that there is a MODERATE 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 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.

Further, intrusive investigative works are recommended to establish the presence and concentration of the contaminants of concern and whether a risk to future site users or the wider environment is present. It is recommended that any future investigative and/or remedial works should be carried out as part of a planning condition.

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

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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 J&J Transport. 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

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2. Groundsure Enviro and Geo Insight. Ref: WES-9264334.
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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 frontage



Figure 2. The undercroft and drive



Figure 3. Building interior



Figure 4. Domestic waste to the west of workshop.

APPENDIX B
Historical Maps

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APPENDIX C
Environmental Reports

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