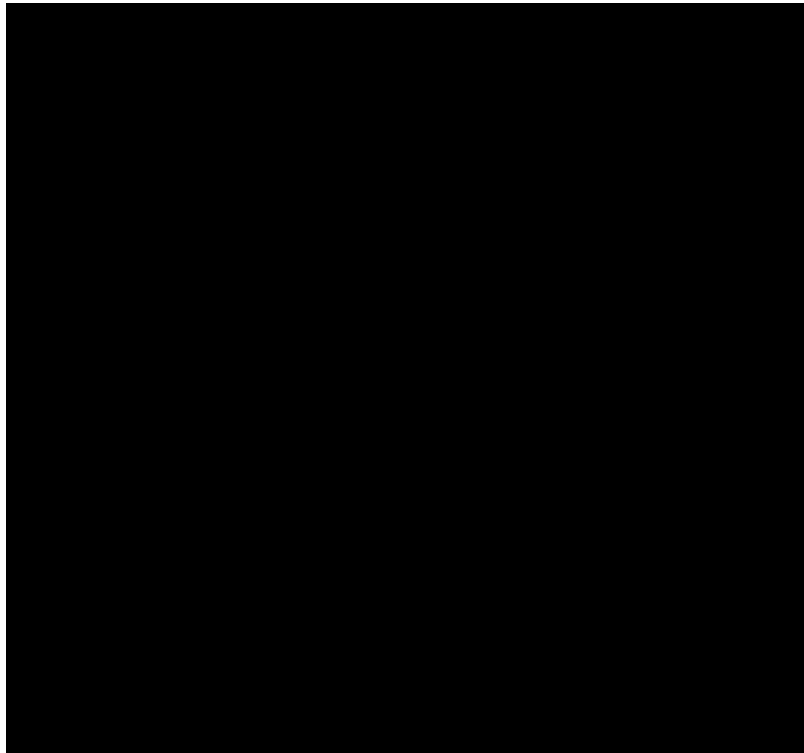




Contaminated Land Solutions

**PHASE 1 SITE INVESTIGATION**

Downside Motors, Chilcompton





Contaminated Land Solutions

**PHASE 1 SITE INVESTIGATION**

**Downside Motors, Chilcompton**

For

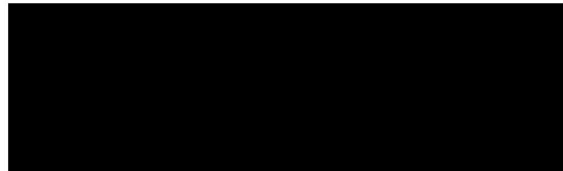
Clarke Design

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

Wesson Environmental



**Prepared by: Rachael Webb  
Junior Environmental Consultant**



**Checked by: Dr. Richard Wesson  
Environmental Consultant**

4<sup>th</sup> November 2022

**Date**

## CONTENTS

<b>1.0</b>	<b>Introduction</b> .....	<b>1</b>
1.1	General .....	1
1.2	Scope of report .....	1
<b>2.0</b>	<b>Site Location and Description</b> .....	<b>2</b>
<b>3.0</b>	<b>Site History</b> .....	<b>3</b>
3.1	Areas of Disturbed Ground .....	3
3.2	Intended Site Use .....	3
3.3	Historical Industrial sites .....	3
3.3.1	Potentially Contaminative Uses identified from 1:10,000 scale Mapping.....	3
3.3.2	Historical .....	3
3.3.3	Historical .....	3
3.3.4	Historical .....	4
3.3.5	Historical .....	4
3.3.6	Historical .....	4
<b>4.0</b>	<b>Geological</b> .....	<b>1</b>
4.1	Geology .....	1
4.1.1	Man Made .....	1
4.1.2	Natural .....	1
<b>5.0</b>	<b>Environmental</b> .....	<b>2</b>
5.1	Hydrology .....	2
5.1.1	Surface .....	2
5.1.2	Source .....	2
5.1.3	Surface .....	2
5.1.4	Surface Water Flooding .....	3
5.1.5	River .....	3
5.1.6	Ground .....	3
5.2	Sensitive .....	3
5.3	Landfill and .....	3
5.4	Current Land .....	4
5.5	Petrol and .....	4
5.6	Electricity .....	4
5.7	Underground .....	4
5.8	Environmental permits, Incidents and Registers .....	4
<b>6.0</b>	<b>Walkover survey and other information</b> .....	<b>5</b>
<b>7.0</b>	<b>Preliminary Conceptual Site Model</b> .....	<b>6</b>
7.1	Introduction .....	6
7.2	Potential Sources of Contamination .....	6
7.3	Preliminary Risk Assessment .....	6
7.4	Ground Gas .....	10
7.5	Mining .....	10
<b>8.0</b>	<b>Conclusions and Recommendations</b> .....	<b>11</b>
<b>9.0</b>	<b>Statement of Limitations</b> .....	<b>12</b>
<b>10.0</b>	<b>References</b> .....	<b>13</b>

## APPENDICES

Appendix A	-	Figures
Appendix B	-	Historical Maps
Appendix C	-	Environmental Data Reports

## **1.0 Introduction**

### **1.1 General**

Wesson Environmental were commissioned to carry out a Phase 1 Site Investigation of the site located at Downside Motors, Chilcompton.

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 365099 151388 and covers an area of approximately 0.21 ha.

### *Current Site Use:*

The site comprises a former car sales and maintenance workshop.

### *Site Boundaries:*

The site is bounded by residential properties to the north, west and south. A field lies to the SE.

### *Surrounding Site Use:*

The surrounding area is used for a mixture of residential and agricultural purposes.

### *Storage Tanks:*

Two tanks are present on the 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 1884– 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 appears to be agricultural land.	1884-1885	1:10,560	The surrounding area is predominantly agricultural. Some residential properties lie 50m to the west of the site. A road lies along the NW site boundary.
	1886	1: 2,500	A pond lies 120m S and another pond lies 200m S.
A building has been built on the site.	1930	1:2,500	Residential properties have been built immediately NE and SW of the site. Residential properties are also present to the north. The pond 200m S is no longer shown.
A large building used as a garage is now shown on the site.	1960	1:2,500	The pond 120m S is no longer shown.
Another building which appears to be non-residential has been constructed on the site.	1972	1:2,500	
The original building on site is no longer shown. A new building is present along the SW site boundary.	1985-1990	1:2,500	

#### 3.1 Areas of Disturbed Ground

No disturbed ground is shown within 100m of the site.

#### 3.2 Intended Site Use

Residential properties are planned on the site.

#### 3.3 Historical Industrial sites

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

19 records found within 500m. Nearest:  
178m NW. Cuttings. Dates: 1967-1990  
188m NW. Cuttings. Date: 1884

##### 3.3.2 Historical Tank Database

4 records found. Nearest:  
338m NE. Unspecified Tank. Dates: 1972-1990

##### 3.3.3 Historical Energy Features Database

1 record found.  
435m W. Electricity Substation. Dates: 1972-1994

*3.3.4 Historical Petrol and Fuel Site Database*

No records found.

*3.3.5 Historical Garage and Motor Vehicle Repair Database*

3 records found:

Onsite. Garage. Dates: 1959-1990

*3.3.6 Historical military sites*

No records found.

## 4.0 Geological Setting

### 4.1 Geology

Current geological maps of the region<sup>2</sup> have been consulted to provide information on geological conditions associated with the site.

*Artificial/Made Ground:*

No records within 500m.

*Superficial Geology:*

No superficial deposits are shown to underlie the site.

*Bedrock/solid geology:*

Bedrock is shown as Conglomerate of the Mercia Mudstone Group (marginal facies). Fracture flow is present, and permeability is classified as very high.

#### 4.1.1 Man Made/ Induced Hazards

Hazard	Risk
Natural cavities	No records found.
BritPits	6 records found. Nearest: 160m E. Commodity: Sandstone
Surface ground workings	7 records found. Nearest: 117m S. Pond. Date: 1938
Underground workings	9 records found. Nearest: 667m S. Colliery. Date: 1932
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.
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	Negligible
Compressible deposits	Negligible
Collapsible deposits	Very Low
Landslides	Negligible
Ground Dissolution	Low
Radon	Between 1-3% of properties are above the Action Level. No radon protective measures are necessary.



## 5.0 Environmental Setting

### 5.1 Hydrology and Hydrogeology

#### *Groundwater:*

Bedrock deposits on site are classified as a Principal Aquifer. These consist of geology of high intergranular and/or fracture permeability, usually providing a high level of water storage and may support water supply/river base flow on a strategic scale. Generally principal aquifers were previously major aquifers

#### *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 Principal Bedrock Aquifer is classified as high vulnerability with a principal flow mechanism of well-connected fractures.

Soils are classified as intermediate leaching class with an infiltration value of >70% and a dilution factor of >550mm/year.

#### *5.1.1 Surface and Groundwater Abstraction Points*

1 groundwater abstractions are shown within 1000m:

987m NE. General Farming and Domestic

No surface water abstractions are shown within 1000m.

No potable water abstractions are shown within 1000m.

#### *5.1.2 Source Protection Zones*

No source protection zones are shown within 500m of the study site.

#### *5.1.3 Surface water*

3 records are shown within 250m. Nearest:

119m NW. Inland river containing water year-round and not influenced by normal tidal action.

#### 5.1.4 Surface Water Flooding

There are no Risk of Flooding from Rivers and The Sea (RoFRaS) records 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 located 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	1 record found: 413m NW. Ancient & Semi-Natural Woodland
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)	2 records found. Onsite. Type: Surface Water 971m NW. Type: Surface Water
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	3 records found. Nearest: 175m NW. Waste Type: Unspecified
Historical waste sites	No records found
Licensed waste sites	No records found
Waste exemptions	10 records found. Nearest: 228m W. Treating Waste Exemption.

#### 5.4 Current Land Use

There are 2 current potentially contaminative industrial areas within 250m of the study site.

Onsite. Downside Motor Company Ltd – Second-hand Vehicles  
21m NW. Staircase Manufacturing Ltd – Access Equipment

Full details are contained in Appendix C.

#### 5.5 Petrol and Fuel Sites

1 record found:

354m E. Obsolete

#### 5.6 Electricity cables

No records found.

#### 5.7 Underground Gas Pipelines

No records found.

#### 5.8 Environmental permits, Incidents and Registers

<b>Industrial Sites Holding Licences/ Authorisations:</b>	<b>Records Held:</b>
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)	No records found
Radioactive Substances Authorisations	No records found
Licensed Discharges to controlled waters	1 record found. Nearest: 162m W. Effluent Type: Sewage Discharges
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	1 record found. 304m W. Pollutant: Inert Materials and Wastes – Soils and Clay. No impact on water, land or air.
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 on 24<sup>th</sup> March 2022 to allow a visual inspection to take place. The site comprised two buildings surrounded by an area of hardstanding.

The building at the SE end of the site contained pits for vehicle inspections, some staining was noted within the building.

No staining was noted in the showroom.

No staining was observed on the external hardstanding areas. Two underground tanks were present, both have been filled, one with foam and the other with concrete.

Other Information:

The site has had a variety of commercial uses, earliest knowledge indicates it was used as a builder's yard and workshop which was used to repair cars. In the late 1920s and early 1930s petrol pumps were present on the NW front of the site. The site was used for car sales from the 1950s and the showroom was built in the 1970s. The 'later workshop' was also built around the 1970s to replace the original workshop. From the early 1980s the site was primarily used for car sales and servicing and the petrol pumps were removed around the 1980s.

---

## 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 the site was originally agricultural land but has been used commercially for car sales and repairs since the 1920s. Presence of two underground tanks and use of the site for car repairs and servicing indicates the potential for petroleum hydrocarbons (TPH) to be present in the subsurface from leakage from tanks or historic spillage from filling tanks or during car servicing. Both short chain compounds generally associated with fuel and long chain compounds associated with oils are anticipated on site.

Made ground is anticipated to be present beneath the site from the demolition of the original workshop and development of the site. The presence of contaminants in site soils including heavy metals, PAHs and asbestos from this source cannot be ruled out.

### 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, we cannot rule out the presence of contaminants in site soils including heavy metals, PAH compounds, asbestos and TPH. Consequently, the main pathways relevant to human health will involve ingestion of soils, consumption of produce, dust inhalation, vapour inhalation and dermal contact. In the case of asbestos, only dust inhalation is a relevant pathway. A tabular conceptual model is presented below:

Source	Pathway	Receptor	Severity	Likelihood	Consequence/likelihood
Heavy Metals, PAH	Ingestion of soils including attached to vegetables	Site Users	Medium	Likely	Moderate Risk
	Consumption of home grown produce		Medium	Likely	Moderate Risk
	Dermal contact		Medium	Likely	Moderate Risk
	Dust inhalation - indoor		Medium	Likely	Moderate Risk
	Dust Inhalation - outdoor		Medium	Likely	Moderate Risk
Asbestos	Dust inhalation - indoor	Site Users	Medium	Likely	Moderate Risk
	Dust Inhalation - outdoor		Medium	Likely	Moderate Risk
TPH	Dermal contact	Site Users	Medium	Likely	Moderate Risk
	Dust inhalation - indoor		Medium	Likely	Moderate Risk
	Dust Inhalation - outdoor		Medium	Likely	Moderate Risk
	Vapour Inhalation		Medium	Likely	Moderate Risk

**Table 7-5. Human health conceptual site model.**

Bedrock deposits beneath the site is shown as a Principal Aquifer. Although no water abstraction points are present within 900m of the site, presence of TPH in soils underlying the site could allow direct migration and leaching of this contaminant through soils and impact the underlying Principal Aquifer. A tabular conceptual site model is presented below.

Source	Pathway	Receptor	Severity	Likelihood	Consequence/likelihood
TPH	Direct migration	Groundwater	Medium	Likely	Moderate Risk
	Leaching		Medium	Likely	Moderate Risk

**Table 7-6: Tabular conceptual model, controlled waters.**



Therefore, risks to site users are considered to be **MODERATE** and to controlled waters are considered to be **MODERATE**.

#### **7.4 Ground Gas**

A landfill is indicated 175m north west of the study site dating from 1986. The waste type is unknown, but 2 other landfill sites are shown 1315m west and 452m west utilising the same stretch of railway cutting, but further from the site. These were all operated the same contractor with the more distant ones recorded between 1981 and 1987. Both of these are recorded as accepting inert and industrial waste. And we would contend that the closer record with the unnamed fill is a continuation of the more distant earlier records. Consequently, we would consider it unlikely that a source of ground gas is present, and consequently risks from this source are considered to be **NEGLIGIBLE**

#### **7.5 Mining**

The site is located within a coal mining area as defined by the Coal Authority. We would advise that a Coal Authority mining report is obtained

## **8.0 Conclusions and Recommendations**

The review of documentary information indicates that there is a MODERATE risk to human health and a MODERATE 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 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 soils<sup>4</sup>.

An intrusive investigation should be undertaken to establish the risk from contaminants detailed in section 7.

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 Clarke Design. 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-8616886.
2. Groundsure Enviro and Geo Insight. Ref: WES-8616887.
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.

## APPENDIX A

### Figures

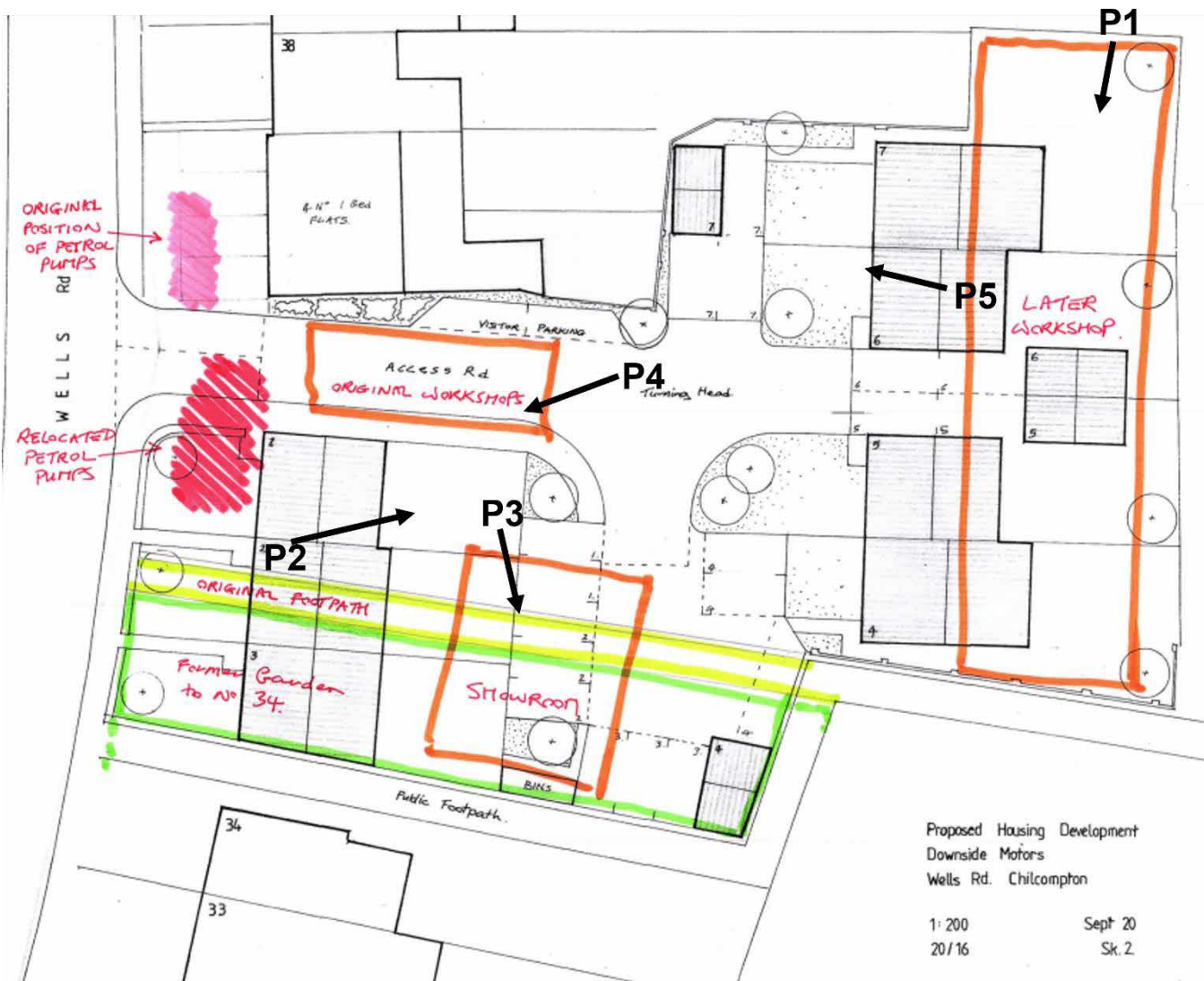


Figure 1: Site plan with photograph locations.



Figure 2: P1



Figure 3: P2





Figure 4: P3



Figure 5: P4



Figure 6: P5

**APPENDIX B**  
**Historical Maps**

## **APPENDIX C**

### **Environmental Reports**