# PRELIMINARY RISK ASSESSMENT

# PROPOSED DEVELOPMENT SITE

# LAND ADJACENT TO NO.5, BEECH CLOSE

# HENTHORN ROAD

# CLITHEROE

# BB7 2LD

# for

# ONWARD HOMES




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# 1. INTRODUCTION

## 1.1 Appointment

Carley Daines & Partners has been commissioned by Onward Homes to undertake a Phase 1 Preliminary Risk Assessment on the proposed development of a small plot of land adjacent to 5 Beech Close, off Henthorn Road, Clitheroe.

## 1.2 Proposed Development

Preliminary plans have been made available to us showing the future development of the land to be residential and containing 2 units. In addition, the development will include associated parking, drainage infrastructure, and gardens.

## 1.3 Objectives

The objectives of this report are to identify any potential constraints to the proposed development with respect to contaminated land. The report will facilitate the design of future geotechnical and environmental ground investigations of the site, and will support a Planning Application for the proposed development.

## 1.4 Scope of Report

The scope of activities included in the production of this study are:

- Assessment of geo-environmental information;
- Assessment of historical and current mapping;
- Production of a preliminary conceptual site model
- Recommendations for intrusive ground investigation.

## 1.5 Previous Investigations

To the best of our knowledge, no previous Phase 1 or Phase 2 Site Investigations have been undertaken on the site. If these exist, they have not been made available to us.

## 1.6 Sources of Information

The following sources of information have been used in the compilation of this report;

- Ordnance Survey Maps at various scales
- Site Specific Environmental Information
- Historical mapping
- A Coal Authority Report

# 2. SITE LOCATION AND DESCRIPTION

## 2.1 Site Location

The site location and description are summarised in Table 1 below.

| Table 1 – Site Description | | |
|---|---|---|
| **Site Location** | The site comprises a small plot of land on Beech Close, which is off Henthorn Road in Clitheroe. | |
| **Site Description** | The site is of a rectangular shape and is accessed via Beech Close. | |
| **Grid Reference** | NGR 373730,441520 | |
| **Site Area** | 300m$^2$ (0.03 hectares) | |
| **Site Setting / Description** | Current Land use: | The site is currently unoccupied and used as garden space by property on Beech Close. |
| | Surrounding area: | The site is located within an area of mostly residential development, although some industrial units are located nearby. |

Site location and site layout plans are presented in Appendix A.

## 2.2 Site Visit

A limited site inspection was undertaken on 14th September 2017.

The small site exists as overgrown garden space *(Fig.1)* and features several trees and shrubs as well as a shed and a small paved area. The site is reasonably level and there are no watercourses present. There is an electricity sub-station *(Fig.2)* located approximately 15m from the site boundary, on Henthorn Road *(Fig.3)*.

*Fig.1 – Site*

*Fig.2 – Electricity Substation*

*Fig.3 – Beech Close entrance*

## 2.3 Site History

The earliest published site plans are from 1847 at 1:10,560, and from 1886 at a scale of 1:2,500. Both plans are from the Lancashire & Furness Series.

The earliest site plan from 1847 indicates the site as being undeveloped. The site is located within open ground, possibly a field. Development around the site is minimal, except for a small number of cottages located at the end of Mill Lane. Clitheroe Railway Station is located approximately 400m north east of the site on the Bolton, Blackburn and Hellifield Line. This railway line passes within 200m east of the site in a north south direction. Holmes Mill (cotton) is located within 500m of the site. The town centre of Clitheroe itself is located 750m to the north east of the site and the development includes several breweries and cotton mills. The River Ribble passes in a north south direction approximately 950m west of the site. There is also a small unidentified watercourse 450m east of the site which runs into Primrose Lodge nearby.

By 1890 the development of Clitheroe has extended to the eastern boundary of the site. The site is now shown near Millthorne House, with further houses shown on the eastern side of Mill Lane. Slightly further south along Mill Lane is a Foulsykes Cotton Mill, approximately 175m from the site. There are two more cotton mills and a paper mill 750m south of the site, adjacent to the nearby railway line. A gas works is now shown 700m north of the site.

Plans from 1893 indicate the site as remaining undeveloped while the expansion of Clitheroe brings increased nearby development – particularly residential. Foulsykes Mill is still shown near the site and there are new areas of allotment gardens. There are further allotment gardens located within 750m of the site. Primrose Mill and Primrose Works are still located 750m south of the site.

Between 1912 and 1932 there was no development on site, though terraced housing development increased to the east.

By 1964, further residential development occurred to the south and south west. Mill Lane is now identified on plans as Henthorn Road. Faraday Avenue runs from north to south 50m away from the site and joins Mill Lane nearby. Properties along Faraday Avenue back onto allotment gardens which run to the southern boundary of the site. The south west flank of the site actually appears to be within an area identified as allotment gardens. Foulsykes Mill is now shown as disused, although still present.

Between 1977 and 1983, Beech Close was constructed alongside Millthorne House. Six properties are shown on Beech Close which curves to the rear of Millthorne House. Access to the site is gained via Beech Close and neighbouring properties have been constructed within the Cul-de-Sac. By 1983 the allotment gardens neighbouring the site are no longer shown, and Foulsykes Mill is now identified as some form of works unit.

There is no significant change between 1983 and the present day though the number of nearby residential properties, schools, shops etc. has increased off site.

| Table 2 – On-Site History | | |
|---|---|---|
| **Potentially Contaminative Past Uses** | Map Date | |
| | From | To |
| Allotment Gardens | 1938 | 1983 |

| Table 3 – Off Site History (within 250 metres) | | |
|---|---|---|
| **Potentially Contaminative Past Uses** | Map Date | |
| | From | To |
| Allotments | 1893 | To Date |
| Residential development & highways | 1847 | To Date |
| Foulsykes Mill (Cotton) | 1890 | 1983 |
| Engineering Works | 1983 | To Date |

There is no evidence to suggest that there has been any significant past industrial, commercial or contaminative use of the site, save for possible minor contamination from former allotments.

## 3. ENVIRONMENTAL INFORMATION

In compiling this section, environmental, geological and ground stability reports produced by Envirocheck were reviewed. Copies of these reports are presented in Appendix B. A summary of the environmental setting is provided in Table 4 below. A coal authority report is also included as Appendix C.

| Table 4 – Summary of Environmental Information | |
|---|---|
| **Made Ground** | There are no obvious areas of made ground on site or within 250m of the site. The closest potential area of infilled land is 500m south east in the location of Primrose Lodge. |
| **Drift Geology** | **On Site:** Indicated as Devensian Till. |
| | **Surrounding Area:** Indicated as Devensian Till and Alluvium. |
| **Solid Geology** | **On Site:** Rocks of the Clitheroe Limestone Formation and the Hodder Mudstone Formation (undifferentiated). |
| | **Surrounding Area:** Rocks of the Clitheroe Limestone formation. |
| **Faults** | There is a fault line relatively close to the site running from the south-west to the north-east. The fault is estimated to be approximately 50m south east of the site at its closest position, and joins another fault line running perpendicular, which also passes close to the site – around 100m north. |
| **Hydrology** | The closest indicated watercourses are the River Ribble, approximately 950m north west of the site, and the unidentified water course running in a southerly direction, approximately 450m east of the site. There are a few isolated ponds within 500m of the site. |
| **Hydrogeology** | The site is located above what is designated as a Minor Aquifer. |
| **Groundwater Abstractions** | There are 2 water abstraction points between 250m & 500m, and a further 7 abstractions between 500m & 1000m from the site. |
| **Discharge Consents** | There are 12 discharge consents within 500m – 1000m of the site. |
| **Source Protection Zones** | None within 1000m of the site |
| **Flood Risk** | The site does not lie within a flood risk area and is not at risk of flooding from rivers or the sea. There is potential for groundwater flooding of property situated below ground level. |

| | |
|---|---|
| **Environmental Incidents** | There have been 5 recorded incidents between 250m & 500m, and a further 34 incidents between 500m & 1000m from the site. These are generally classified as minor incidents, typically occurring pre 2000. |
| **Mineral and Coal Extraction** | The Coal Authority Report indicates that the site has not been affected by past coal mining. |
| **Brine Compensation** | The site is not within a known brine compensation area. |
| **Radon Gas** | The site is located within an intermediate probability radon area.<br>No Radon protection measures are necessary. |
| **Hazardous Installations** | There are no obvious hazardous installations within 500m of the site. |
| **Potentially Contaminative Land Uses** | The Envirocheck data indicates 2 historic landfill sites between 500m & 1000m from the site. |
| **Shrinkage/Swelling of Clay** | Very low risk. |
| **Landslip** | Very low risk. |
| **Running Sands** | Very low risk. |
| **Compressible Deposits** | No risk. |
| **Collapsible Deposits** | Very low risk. |
| **Chemical Contamination** | Chemical Contamination Plans do not indicate the site as being at any significant risk from chemical contamination. |

# 4. ENVIRONMENTAL RISK ASSESSMENT

## 4.1 Preliminary Conceptual Site Model

A conceptual site model (CSM), which supports the identification and assessment of contamination-pathway-receptor pollutant linkages, is integral to the overall process of risk assessment. A CSM provides a foundation for hazard identification and risk estimation. For a risk to be present, all three components of an identified pollutant linkage must be present. The potential risks have been assessed with respect to the most sensitive land use, which is deemed to be residential, with plant uptake.

Risk estimation is based upon consideration of magnitude, probability, and consequence of a contaminant-pathway-receptor linkage occurring. This is in line with best practice and guidance described in CLR11[1].

### 4.1.1 Possible Sources of Contamination

Based upon a review of historical maps and available environmental information, there is potentially a low risk of contamination at this site most likely as a result of previous agricultural use as allotment gardens – very low level pesticides.

The site is not located in a coal mining area and is unaffected in this respect.

### 4.1.2 Possible Pathways

In our assessment of potential exposure pathways, we have used a residential with gardens land use scenario.

Potential exposure pathways are as follows:

- Ingestion of soil and soil derived indoor dust;
- Ingestion of home grown produce and soil attached to home grown produce;
- Dermal contact with soil and soil derived indoor dust;
- Inhalation of indoor and outdoor dust (on and off site);
- Inhalation of indoor and outdoor vapours;
- Migration of mobile contaminants in groundwater; and

### 4.1.3 Potential Receptors

Based upon development of the site to a residential gardens end use, the following potential receptors have been identified:

- Site users (residents and visitors);
- Construction workers;
- Buildings;
- Drinking water supplies;
- Minor aquifer

A summary of the potential pollutant linkages is presented as a CSM in the following Table 5.

| Table 5 - Conceptual Site Model | | | | |
|---|---|---|---|---|
| Potential Source | Potential Pathways | Potential Receptor | Comments | Risk |
| On-site contamination | Ingestion<br>Dermal Contact<br>Inhalation | Human Health - Site Users, Maintenance Staff, Contractors | There have been previous activities on site that might lead to contamination, including allotment gardens. However, these are considered to be minor. | Very Low to Low |
| | Direct Contact | On-site structures, Water pipes | | |
| | Migration of contamination to groundwater | Local Water Courses, Underlying Aquifer | Site above a minor aquifer. | Very Low |
| Off-site contamination (Heavy Metals, PAH's TPH, Asbestos & pH) | Ingestion<br>Dermal Contact<br>Inhalation | Human Health - Site Users<br>Maintenance Staff<br>Contractors | Levels of contamination may be present immediately off-site in ground workings & due to previous industrial activities. These will diminish with increasing distance from site. | Low |
| | Direct Contact | On-site Structures<br>Water Pipes | | |
| | Migration of contamination to groundwater | Underlying Aquifer | Site above a minor aquifer. | Very Low |
| Ground gas from nearby landfill sites | Migration through permeable strata | Human Health, On-site Structures | There are no significant ground workings & landfill adjacent to the site. | Very Low |
| Coal Mining / Brine Pumping | Voids close to surface | Buildings, roads & services | The Coal Authority Report indicates that the site is not affected by mining. The report does not indicate that the immediate area is affected by brine subsidence. | Zero |

# 5. CONCLUSIONS AND RECOMMENDATIONS

## 5.1 Conclusions

Carley Daines and Partners have completed a Preliminary Risk Assessment for the proposed development site at Beech Close, off Henthorn Road, Clitheroe. This is being considered for redevelopment for residential end usage.

The purpose of the report is to identify possible constraints to the proposed development, and to provide appropriate information to form part of any future planning submission. Based upon an assessment of the available information and development of the conceptual site model, it is considered likely that several potential pollution linkages may be relevant to the site which require further investigation and assessment. In addition to the identified sources, there may be localised areas of contamination present as a result of unidentified activities at the site.

## 5.2 Recommendations

An intrusive ground investigation is recommended to investigate the potential pollutant linkages that have been identified. The purpose of the site investigation would be to provide sufficient data to enable a robust site specific Risk Assessment and to identify potential remedial requirements and to enable an appropriate waste disposal management strategy to be drawn up. In addition, the ground investigation should include a geotechnical assessment to confirm the ground conditions with respect to appropriate foundation design.

It is recommended that the ground investigation comprises a series of boreholes and trial pits targeted to the sources of contamination identified in this report across the site to provide site wide coverage. Specifically, sampling and testing for heavy metals, TPH and PAH should be undertaken as well as screening for asbestos. No significant levels of contamination are anticipated, but this is precautionary and in line with good practice. Ground gas monitoring is not considered necessary due to the absence of any significant landfill either on site or within 250m.

Although significant on site inground contamination is not anticipated, we believe that the above proposals set out a prudent and balanced approach in relation to the possible future site development, given the sites previous use as an allotment garden.

**SIGNED**

C.R. CARLEY
CARLEY DAINES & PARTNERS

# A P P E N D I X  A

## SITE PLANS

# A P P E N D I X  B

## ENVIROCHECK REPORT

# A P P E N D I X  C

## COAL AUTHORITY REPORT