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Contaminated Land Phase One Desk Study Report for Clifton House Farm, Clifton Hill, Preston PR3 0AR

Prepared for:

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Summary

This report consists of a phase one contaminated land desk study produced in support of planning application for residential properties at Clifton House Farm, Clifton Hill, Preston, PR3 0AR.

Following the site walkover and review of the available information it has been concluded that no contamination exists which poses a significant risk of significant harm to the identified receptors either on site or in the immediate vicinity and the site is considered safe and suitable for the intended use.

The report further recommends that a watching brief is maintained throughout the construction of the new dwelling and any signs of potential contamination found and fully investigated, with appropriate remedial action taken as necessary.

Raond protection measures may be required for the proposed properties as 1-3% of properties in the area are reported to have radon levels above the action level.

Contents

Introduction

Martin Environmental Solutions has been commissioned, to carry out a phase one contaminated land desk study report in relation to a proposed residential development at Clifton House Farm, Clifton Hill, Preston, PR3 0AR.

Aims and Objectives of the report

The aims and objectives of this report are as follows:

- Assess the likelihood of contamination affecting the site,
- Identify any likely receptors to be affected by the potential contamination,
- Identify the pathways by which the receptors will be exposed to any potential contamination,
- Identify any areas where further investigation will be required.

Scope of works

This report has been written in line with the 'BS 10175: 2011 Investigation of potentially contaminated sites – Code of Practice' and 'The Model Procedures for the Management of Land Contamination, CLR11'.

The scope of this report covers the phase one desk study only. It will look at relevant information on: -

- the history of the site and surrounding area,
- the current use of the site and surrounding area,
- the geology and hydrogeology of the area,

A site walk-over survey has been undertaken in addition to consultations with the existing site owners, to identify any potential contamination issues.

Evaluation of the above information will be used to construct an initial conceptual model as appropriate, with the identification of any additional investigations that may be required.

The Site:

Site Address: Clifton House Farm, Clifton Hill, Preston, PR3 0AR.

Grid reference: 348375, 451240

An aerial photograph of the site is included in Figure 1.

Current Site use:

The site is located to the west of School Lane and south of Stony Lane, access is via this road. The site consists of agricultural land, to the east beyond School Lane lies the village of Forton. Whilst to the south, west and north is similar agricultural land.

The centre of the site is occupied by a cricket ground which has its eastern boundary defined by School Lane.

Research

Details of Research

This report has been based on information gathered from a number of reputable sources, covering details:

- on the historic and current use of the site,
- any known waste disposal activities in the area,
- any regulated industrial activities within the vicinity of the site including recorded industrial accidents,
- on the geology, hydrogeology, hydrology of the area,
- identification of any environmentally sensitive sites,
- any natural hazards.

Principle sources of this information have been:

- environmental data from Groundsure Limited
- the Local Planning Authority,
- historic maps (Lancashire County Council, Groundsure Ltd),
- site walk-over survey and discussion with the current owners.

Site History

Information on the historic uses of the site has been obtained from historic mapping information, and environmental data from Groundsure Limited, and a discussion with the site owner.

Mapping Year	Changes on Site	Changes off Site
1847	The site is agricultural, a pond are clearly shown located in the northwest corner. An unspecified pit is shown at the centre.	The area is primarily agricultural fields. A farm "Clifton Hill farm" is shown to the north. Stony Lane and School Lane are identified. To the east the A6 and further east the West Coast railway line, the Lancaster Canal is located to the west. A number of ponds are clearly shown, the nearest along the boundary of the site are located east, southeast and west. The Lancaster canal is shown to the east 500m away.
1890	No Change	No significant changes. The farm now renamed "New Farm"
1910-12	No Change	No significant changes. The farm changes name to "Newstead Farm" The village of Forton is very sparsely developed to the east.
1932-33	No change,	A disused quarry – Richmond quarry is shown 600m to the north. .
1951-55	No change	No significant changes
1963	No change	No significant changes
1970-71	The unspecified pit is now infilled	Considerable housing development expanding Forton. The cricket ground is commissioned Electricity sub-station erected 186m east, nurseries established 9m northeast and two pumping stations adjacent. A garage has been established 170m east.
1994	No changes	The pumping station and the land it

		occupied is developed into housing, the pumping station is still present. The nursery has expanded
2002	Pond in the northwest corner is longer shown on map.	No significant changes
2010-14	No changes	No significant changes

Regulatory Information

Relevant information obtained from the Groundsure report (Appendix 1) is summarised below.

No permitted activities have been identified within 500m of the site as defined in the Environmental Permitting (England and Wales) Regulations 2010 or previous legislation.

One landfill site has been identified, 381m west, the licence is noted as surrendered. It is not likely that this will impact on the site.

One pollution incident has been identified within the area, 484m north involving oils and fuels in July 2003. There was only minor impact on to water and land.

Five discharge consents have been identified. All sewage discharges located 9m and 27m northwest and 183m northeast. The first two site are pumping stations for sewage discharges while the third site is historic. All are considered to be insignificant, as a source of contamination for the site.

Four current land uses have been identified which are potentially contaminative. Two are both gas transmission pipelines, the nearest is 9m west on the downward side of the site and the other 183m north. There is an electricity substation located 180m east and a pumping station 129m northeast of the site. It is unlikely that these will impact on the site.

Historical potentially contaminative land uses have been identified within 250m of the site from the purchased information; most of these have been identified from the historical mapping and include:

- Refuse heap 5m east in 1846 located on the farm
- Nurseries 9m northeast (now being redeveloped into housing)
- Grave yard 178m east
- Electricity sub-station 186m east
- Garage 168m east
- Ponds

A number of further sites, including the gravel pit, quarry, some unspecified tanks and additional ponds are identified between 250 and 500m. Based on the road network, development to the east, distance and topography of the area it is unlikely that any of these historic land-uses will impact on the proposed site.

Other potentially contaminative land uses are considered later see section headed "Site Walk-Over".

Geology and Hydrogeology

Information from the British Geology Survey 1:50,000 mapping identifies the bedrock in the area as Accerhill, Sherwood and Crossdale sandstone and mudstone formation, overlaid with Alluvium (Clay, Silt, Sand and Gravel) and Till, Devensian.

The information obtained on the hydrogeology of the area identifies the site as having Secondary A and Secondary (undifferentiated) aquifer located within the superficial deposits storing limited amounts of water supporting water supplies at a local level. A Principle and a Secondary A aquifer supporting strategic water supplies in the bedrock.
Three surface water abstraction licence sites have been identified, one historic and two active located 1725m and 1928m southeast. There are no ground or potable water abstraction licences.

The site is located within a Source Protection Zone 3. The Groundwater vulnerability and leaching potential is described as low.

Hydrology

The Biological and Chemical information provided covers watercourses the nearest of which the nearest is 774m south and is currently classified as good.

There are a number of detailed watercourses identified within 500m of the site. Those to the northeast flow into the watercourse on site which continues flowing westward towards the Lancaster Canal and the coast. All of these are described as Tertiary rivers and provide drainage for the surrounding farm land.

Environmental Sensitivity

There are two identified sites, both are Ancient woodlands, located 1499m and 1561m southeast.

The property is in an area identified as having between 1% and 3% of properties above the action level of 200 Becquerel's per cubic metre. However further detailed information for the specific site can be found on the UK radon website (www.ukradon.org). A copy of the Health Protection Agency Maps, (Appendix 3) is included. Radon protection measures may be required for new buildings or any future development.

No additional natural hazards have been identified & the site has very low/moderate risk of shrink swell, running sand, with a moderate risk of compressible ground.

Site Walkover

A site walkover was undertaken on the 28th August 2016, and confirmed much of what had already be identified from the information obtained. The photographs in Appendix 4 provide some indication of the current layout and condition of the site.

The site is agricultural land consisting of ground of widely differing topography. The land generally slopes east to west, but the bottom half of the site (east), is flat, with a slight fall towards the south and west. Whilst the top half (west) raises significantly from the northern and western boundaries. This part of the site was at the time of the Walk-over planted with Maize.

A cricket ground almost divides the site in half, located at the centre of the site, starting in the east running towards the west for approximately 105m roughly 2/3th of the width.

A number of potentially contaminated uses were identified and are as follows:

Unspecified Pit on-site at the approximate centre

Ponds on-site eastern boundary (note: wrongly labelled NE on Groundsure report)

Ponds on-site south-eastern boundary (note: wrongly labelled E on Groundsure report)

Ponds 1m west

The site of the pond located in the northwest corner does not appear to have been infilled, but is a drained “Dew Pond” which would only contain water during winter months, some infilling may also have occurred during normal farming activities.
The remaining ponds were carefully inspected and are not considered to be significant. No evidence of any contamination was found, the ponds are surrounded by lush vegetation and have significant quantities of wildlife resident. They may however be a receptor for any future potential contamination.

The site of the pit was confirmed as being infilled, due to its location, reference to historic maps and aerial photographs and actual inspection. We considered it most likely to have been infilled from spoil produced during the establishment of the cricket ground. No evidence of contamination was found and it is considered of low risk of

causing significant harm. However, a watching brief is recommended during development.

Conclusions

Potential Contaminants

Following a review of the information gathered on the history of the site and the surrounding area, and following the site walk-over survey there are no contaminants identified on or off site that are likely to present a significant harm to any identified receptor.

Historic records identified the infilled pit adjacent to the northern boundary of the cricket ground and it is considered that this has been infilled following creation of the cricket ground or normal farming practises – ploughing. However this should be carefully considered as part of the watching brief during the construction phase.

Radon levels in the area suggest that 1-3% of properties will experience level above the action level.

Receptors and Pathways

Potential receptors which may be affected by any unknown contamination on site will include:

- Construction workers who are likely to be affected by any potential contamination as they will initially be working in the ground and are likely to be the ones who unearth any potential contaminants.
- Future users of the site, including residents, staff and visitors to the site. For the purpose of evaluating any effects from any contamination found during any intrusive investigation future users/visitors to the site should be regarded as the 0-6 year old female child.
- Any building on site e.g. foundations which may be attacked by any contaminants in the ground or services.
- The underlying groundwater which may be contaminated by migrating pollutants present on the site. There is also the potential for further pollution of the groundwater or the watercourse from disturbing any potential contaminants on site.
- The watercourses, on site and to the west
- The ponds

The pathways by which these receptors may be exposed to any unforeseen potential contamination will include:

Construction workers

- Inhalation, of gases or vapours released during ground work or fine particles.
- Ingestion of the contaminants, principally from cross contamination with contaminated soil and inadequate hand washing before smoking and eating.
- Absorption through the skin following contact with contaminated soil.

Future users and visitors

- Inhalations of gas/vapours or fibres, particularly if these are allowed to enter the new structures through the ground, and build up in an enclosed area.
- Ingestion of contaminants, through the ingestion of contaminated soil from the garden area via direct contact, e.g. playing in the garden.
- Absorption of contaminants from dermal contact with contaminated soil.

Buildings

Contaminants on site have the potential to affect the foundations to the new building or the services supplying it.

Watercourses

As discussed above, if they exist on site, there is a potential for any contaminants to migrate through the ground into the groundwater and aquifer or via run-off into the watercourse.

Conceptual Model

The table represents a basic conceptual model. It highlights the potential sources of pollutants identified from the gathered information, and potential pathways in which any contaminants could reach the identified receptors.

Pathway	Description	Identified sources	Receptor at risk	Likelihood
1	Run off and seepage into groundwater from any spillages	-	Watercourse/ Environment	V. Low
2	Migration of gases into the building.	Radon	Future users	Low
3	Inhalation of gases/ vapours outside	-	Construction workers/future users	V. low
4	Inhalation of fine particles	-	Construction workers/future users	V. Low
5	Direct ingestion of contaminated soil	-	Construction workers/future users	V. Low
6	In-direct ingestion of contaminated soil	-	Future users	V. Low
7	Absorption via direct	-	Construction workers/future users	V. Low

	dermal contact with contaminated soil			

Recommendations

As a result of the investigation into the historical use of the site and surrounding area no sources of contamination have been identified, which present a significant possibility of significant harm to the any of the identified receptors.

Based on the information available the site is likely to be suitable for the intended use.

However further information on the radon levels are required and radon protection measures may be required within the construction of new properties.

In addition, a watching brief is required during the development, particularly in the area of the infilled land (unspecified pit) located on-site and discussed previously.

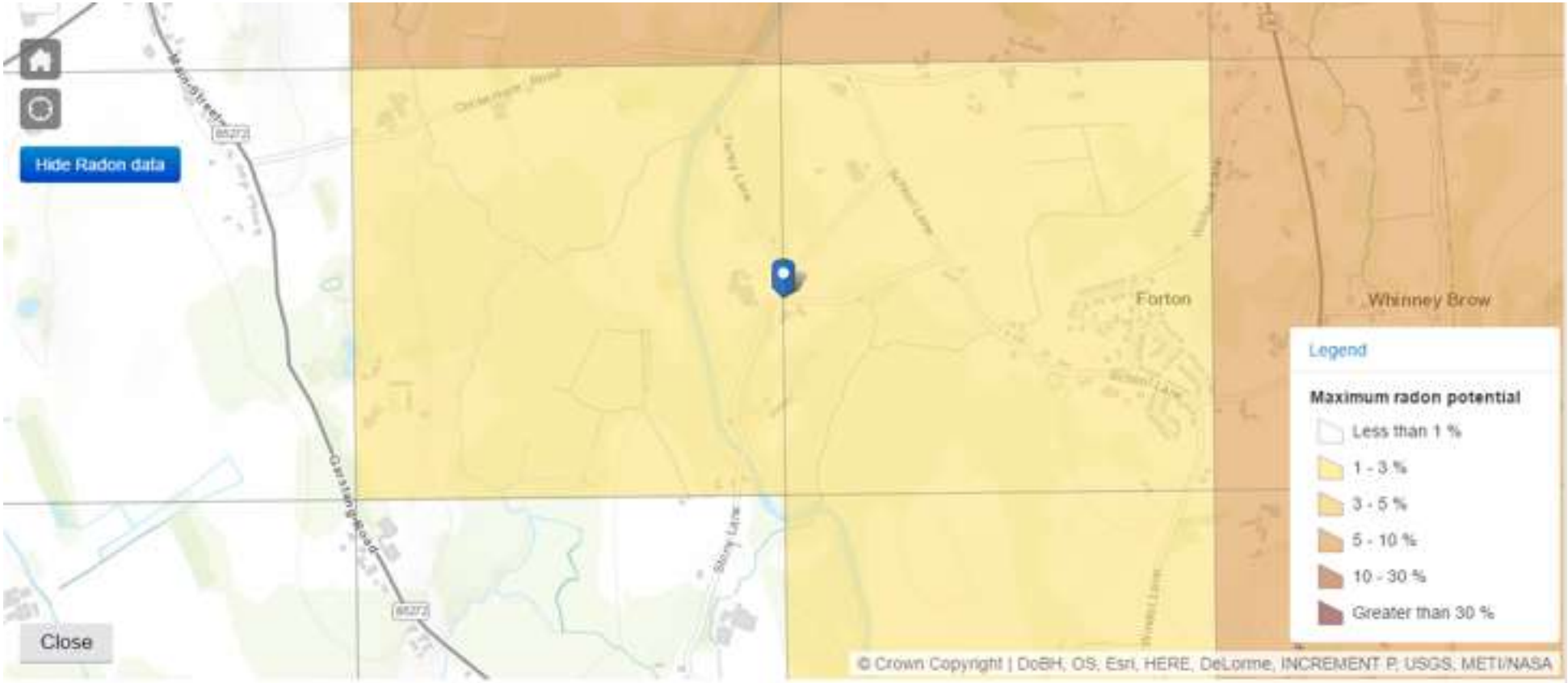
Should any unforeseen contamination be found during the construction works then appropriate measures should be taken to identify the risk posed and the local planning authority informed of the findings and proposed remedial action.

Figure 1 – Aerial Photograph

Appendix 1 – Groundsure Data

Appendix 2 – Historic Maps

Appendix 3 - Radon Maps



Appendix 4 – Site Photographs

Site access from Stony Lane

Close up of dried up pond northwest corner

Farm track leading from access gate

Pond on western edge

View looking east lower half of site

View towards cricket ground from southwest corner

Looking west lower half of site

Pond on south-eastern edge

View north over cricket ground showing elevation of top half of site

Eastern corner towards pond

View east along southern edge of cricket ground

View back toward location of infilled pit

Pond at eastern edge

Watercourse flowing west at centre of site