

Land West of Kidmore End Road: Land Quality Desk Study

P25033_R1
March 2025



Document Control

Title

Land West of Kidmore End Road: Land Quality Desk Study

Client

Fairfax Acquisitions Limited,
Bunton Barn,
Bunton Lane,
Bolney,
Haywards Heath,
RH17 5RE

Reference

P25033_R1

Status

Final

Document reference	Issue date	Comments	Written by	Approved by
P21335_R1	September 2022	Draft	SW	JEM
P25033_R1	March 2025	Updated to Aqua Terra	RLW	JEM

Table of Contents

1.	Introduction	4
1.1.	Instruction.....	4
1.2.	Brief.....	4
1.3.	Scope	4
1.4.	Limitations.....	4
2.	Desk Study	5
2.1.	Site Location.....	5
2.2.	Proposed Development.....	5
2.3.	Geology	5
2.4.	Hydrogeology.....	5
2.5.	Hydrology	5
2.5.1.	Surface Water.....	5
2.5.2.	Flooding	6
2.5.3.	Groundwater	6
2.6.	Site History.....	6
2.7.	Environmental Database Search	6
2.8.	Geo-hazards.....	7
2.8.1.	Potential for chalk mining and solution features	7
2.9.	Environmental Designations	8
2.10.	Preliminary UXO Risk Assessment.....	8
3.	Conceptual site model and risk assessment	9
3.1.	Sources	9
3.1.1.	On Site source potential	9
3.1.2.	Off Site source potential.....	9
3.2.	Pathways.....	9
3.2.1.	Construction-phase pathways	9
3.3.	Receptors	9
3.3.1.	Human health	9
3.3.2.	Wider environment.....	9
3.4.	Qualitative risk assessment.....	10
4.	Conclusions and next steps	12
4.1.	Conclusions	12
4.2.	Next Steps.....	12
5.	References.....	13

List of Tables

Table 2-1	Strata encountered in nearby historical borehole logs	5
Table 2-2	Site history.....	6
Table 2-3	Environmental database records	7
Table 2-4	Summary of geo-hazards	7
Table 2-5	Solution features.....	8
Table 3-1	Pollutant linkage assessment	11

Drawings

P25033_R1_D01 Site Location Plan

List of Appendices

- Appendix A: Report Conditions
- Appendix B: Drawings provided by the Client
- Appendix C: Envirocheck Report
- Appendix D: Ciria 552 Risk Matrix

1. Introduction

1.1. Instruction

Aqua Terra Consultants Ltd (Aqua Terra) was instructed by Fairfax (Reading) Ltd (the Client) to provide a Phase 1 preliminary risk assessment (land quality desk study) for a parcel of land west of Kidmore End Road, Oxfordshire (the Site). Instruction to proceed in accordance with Yellow Sub proposal (Ref: P21335_P1_Rev1) was confirmed by email dated 8th June 2022.

1.2. Brief

The brief was to provide a land quality desk study to support the proposed development of up to 70 dwellings on the Site through the planning process.

1.3. Scope

This report presents records of desk study research, which is in-turn used to develop a conceptual site model and inform a preliminary environmental risk assessment. The information and assessment presented herein is considered sufficient to support the planning application process.

The report identifies key potential land quality risks and uncertainties associated with the ground conditions which may require further assessment and/ or risk management in due course via suitable condition(s) linked to the future planning consent.

1.4. Limitations

This report is written strictly for the benefit of the Client and bound by the conditions presented in Appendix A.

2. Desk Study

2.1. Site Location

A Site Location plan is presented as drawing P25033_R1_D01. The Site address is as follows:

Land off Kidmore End
Road, Emmer Green,
Oxfordshire,
RG4 8SE

The Site area (taken from the red line boundary presented in Appendix B) is approximately 5.9Ha and the British National Grid Reference at the centre of the Site is: 471460, 177140.

2.2. Proposed Development

At present, we understand the proposed development will comprise up to 70 residential dwellings.

2.3. Geology

According to British Geological Survey (BGS) 1:50,000 scale mapping and nearby published boreholes, the geological sequence underlying the Site is as follows:

- Superficial deposits: Black Park Gravel Member (sand and gravel)
- Bedrock Geology: Seaford and Newhaven Chalk Formations (White Chalk)

The superficial deposits are discontinuous, outcropping only across the southwest of the Site. A nearby borehole log in the BGS database is summarised below in Table 2-1.

Table 2-1 Strata encountered in nearby historical borehole logs

Borehole ref.	Strata	Maximum thickness (m)
SU77NW68	Soils and pebbles	0.3
(Northern Site boundary)	Chalk and flints	70

2.4. Hydrogeology

The superficial Black Park Gravel Member is classified by the Environment Agency (EA) as a Secondary A Aquifer, which is defined as 'permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming important source of base flow to rivers'.

The White Chalk bedrock is classified by the EA as a Principal Aquifer. These are defined as 'layers of rock or drift deposits that have high intergranular and/or fracture permeability – meaning they usually provide a high level of water storage. They may support water supply and/or river base flow on a strategic scale'.

The Site lies in Zone III (Total Catchment) of a Source Protection Zone (SPZ) and groundwater vulnerability is noted to be high.

2.5. Hydrology

2.5.1. Surface Water

The nearest surface water feature is Emmer Green pond located approximately 540m south-east of Site. The Site also lies 2.5km to the north of the River Thames.

2.5.2. Flooding

According to the EA, the Site is located in Flood Zone 1 (low risk). Surface water (pluvial) flood risk at the Site is noted to be low.

2.5.3. Groundwater

According to the BGS, there is limited potential for groundwater flooding to occur on Site.

2.6. Site History

A review of historical Ordnance Survey (OS) mapping of the Site has been undertaken. The historical mapping is provided in Appendix C. The salient observations of historical changes have been summarised in Table 2-2.

Table 2-2 Site history

Epoch	Details	Development Consideration
1878-1901 (1:2,500 & 1:10,560)	Earliest OS mapping shows the Site and surrounding area are predominately fields, most likely used for agriculture. Chalk pits are present approximately 100m north and 100m west of the Site.	None.
1913-1938 (1:2,500 & 1:10,560)	The Site has been redeveloped into a golf course. The chalk pits to the north and west of the Site are now labelled as disused. Allotment gardens are noted approximately 100m south-west of the Site. A small building is noted immediately north of the Site within Cucumber Wood. Development of Emmer Green to the west and east of the Site is noted in the 1930s.	None.
1956-1973 (1:2,500 & 1:10,000)	Emmer Green continues to be developed in the wider area to the south, west and east of the Site.	None.
1990-Present (1:2,500 & 1:10,000)	No significant changes.	None.

2.7. Environmental Database Search

An Envirocheck report was purchased as part of the desk study assessment. The full database report is provided in Appendix C. A summary of the database records is provided in Table 2-3 below with reference to entries within 250m of the Site, unless considered to be relevant at greater distances.

Table 2-3 Environmental database records

Distance / direction	Land use / permitted activity / authorisation	Development consideration
On-Site to 14m (N & E)	2No. discharge consents for sewage final/treated effluent discharged into underground water, freshwater rivers and to the land.	None.
67m (NE)	1No. pollution incident to controlled water. Closest incident to the NE was oils (unknown) – minor incident.	None.
165m to 205m (W & E)	2No. contemporary trade directory entries for a mechanics and a cleaners both of which are inactive.	None.
116m (NE) and 144m (N)	2No. extractive mining pits which are now disused.	Infilled material of the pits could lead to leachate and gas generation.
103m (W), 135m (N) and 145m (E)	3No. BGS recorded mineral Sites, all opencast mines which have ceased operation.	

2.8. Geo-hazards

The EnviroCheck report provided in Appendix C includes information from the BGS regarding potential geohazards on or near the Site. These potential geo-hazards have been summarised in Table 2-4 below.

Table 2-4 Summary of geo-hazards

The following potential ground stability hazards have been identified by the BGS on-Site:		
Ground stability hazards	<i>Collapsible ground</i>	Very Low
	<i>Compressible ground</i>	No Hazard
	<i>Ground dissolution</i>	Low
	<i>Landslide ground</i>	Very Low
	<i>Running sand</i>	Very Low
	<i>Shrinking or swelling clay</i>	No Hazard
Radon	The property is in a lower probability radon area (less than 1% of homes are estimated to be at or above the Action Level).	

2.8.1. Potential for chalk mining and solution features

This Site is located on the White Chalk with thin and feather edge superficial deposits (Black Park Gravel Member) also present. The area is also well documented for the presence of both natural solution features (see Table 2-5) and rare chalk mines associated with the historic brick making process.

Whilst the potential for solution features on Site is possible, the geology indicates that their effect will likely be minimal. Due to the presence of White Chalk at the surface or beneath thin superficial

deposits, the potential for future surface instability is much lower than where significant overlying 'bridge' deposits are present.

The EnviroCheck report confirms the above with ground dissolution on Site as having a low hazard potential. However, as noted in Table 2-5, there are records of features within 30m of the Site.

Previous work on the parcel of land to the south of the Site (also within the former golf course), noted the recorded presence of a solution feature on the south-western boundary of the Site together with a 'band' of medium to high risk of solution features present across this adjacent parcel of land. However, none were noted to be present on-Site.

Table 2-5 Solution features

Distance / direction	Record details	Development consideration
240m (SW)	Shaft entry pillar and stall chalk mine	None.
30m (W), 41m (SW), 135m (NE), 159m (N) and 241m (W)	5 No. natural cavity groups (sinkholes and solution pipes)	Consideration of identifying potential solution features during future Site investigation works.

2.9. Environmental Designations

Online mapping (Defra) indicates that the Site lies within a Nitrate Vulnerable Zone. There are no other environmental designations on or in the immediate surrounding areas (<500m).

2.10. Preliminary UXO Risk Assessment

Zetica produce online mapping relating to potential risks associated with discovering unexploded ordnance (UXO). Based on this mapping, the Site is indicated to be at low risk from all forms of Unexploded Ordnance.

3. Conceptual site model and risk assessment

The following section draws together a preliminary conceptual site model. The relationship of identified sources, viable pathways and identified environmental receptors is considered and used as a technical basis to inform a qualitative assessment of risk to human health and the wider environment posed by the proposed ground conditions and the proposed redevelopment of the Site.

3.1. Sources

The key identified contaminant sources are summarised as follows and covered within the risk assessment table in Section 4 below.

3.1.1. On Site source potential

- None.

3.1.2. Off Site source potential

- **Infilled chalk pits:** Potential for the generation and migration of leachate and/ or ground gas associated with Made Ground (if the chalk pits are infilled).

3.2. Pathways

For the purposes of this risk assessment, it is assumed that the relevant pathways comprise:

- Direct contact with sub-surface materials (dermal soil/ leachate contact, soil ingestion and dust ingestion/ inhalation);
- Leaching of contaminants to groundwater;
- Migration of dissolved phase contamination in groundwater;
- Ingress into potable supply pipes;
- Preferential flow through the drainage system; and,
- Migration of gas and/ or vapours through preferential pathways and/ or permeable sub-surface materials.

3.2.1. Construction-phase pathways

In addition to the above, during the redevelopment of the Site it will be necessary to cause a period of exposure of bare earth. This in turn will allow for increased infiltration during rainfall events, and therefore an increased potential for leaching and throughflow of potential sub-surface contaminants.

3.3. Receptors

The key identified potential environmental receptors are summarised as follows and covered within the risk assessment table in Section 4 below.

3.3.1. Human health

- Demolition, construction and maintenance workers (short term acute risks); and,
- Future residential Site users.

3.3.2. Wider environment

- Secondary A (Black Park Gravel Member) and Principal Aquifers (White Chalk); and,

- Surrounding residential areas.

3.4. Qualitative risk assessment

A summary of the potential contaminant linkages associated with the Site is presented in Table 3 1, alongside an assessment of the risks posed by each linkage. The contaminant linkages have been assessed using the risk assessment methodology described in CIRIA C552 (2001). As such, risk is considered to be a function of both the probability (likelihood) of contamination occurring at the study site and also the potential severity (consequence) of the environmental impacts associated with any such contamination. The classification system used to define contaminant probability, consequence and risk is described in Appendix D.

Land West of Kidmore End Road: Land Quality Desk Study
P25033_R1

Table 3-1 Pollutant linkage assessment

Sources	Pathways	Receptors	Consequence	Probability	Risk	Discussion
Off-Site infilled chalk pits.	Direct human contact exposure pathways (dermal, ingestion, inhalation)	Future Site users (Residential)	Medium	Unlikely	Low risk	None required.
		Construction workers	Mild	Unlikely	Very low risk	If unexpected contamination is identified, potential risks to construction workers can be adequately managed through standardised precautions (good hygiene practices and PPE) and health and safety procedures when working on Site.
	Ingress into potable supply pipes	Future Site Users (Residential)	Medium	Unlikely	Low	None required.
	Migration of gases and/or vapours through permeable subsurface materials and/or preferential pathways	Future Site Users (Residential)	Medium	Unlikely	Low	None required.
	Leaching and/or water mobile constituents passing through permeable sub-surface soils and/or shallow preferential pathways	Secondary A and Principal Aquifers	Medium	Unlikely	Low	None required.

4. Conclusions and next steps

4.1. Conclusions

The Site comprises part of a former golf course within a mixed residential and rural area. Historically the Site has remained a golf course for over 100 years, with the residential development of Emmer Green typically occurring between the 1930s and 1950s to the east, south and west of the Site.

Based on the desk study, no significant on-Site sources of contamination have been identified with the only off-Site sources comprising historic chalk pits located approximately 100m north and west of the Site.

The Site is within an area known to include solution features and rare man-made cavities. However, as the White Chalk either outcrops at the surface or below a thin veneer and/ or feather edge of superficial deposits, the potential risk to the development is considered to be low.

Based on the findings of the desk study and the proposed residential development an assessment of land quality has been undertaken in accordance with current guidance and best practice. On this basis, the potential risks to **human health** and the surrounding **environment** are considered to be **VERY LOW TO LOW**.

4.2. Next Steps

The preliminary conceptual site model and desk based preliminary risk assessment presented herein are considered sufficient to support the proposed planning application. However, to support the proposed development design, once planning has been granted, a site investigation should be undertaken to confirm the ground conditions present. It may be prudent to include geophysical testing to confirm the absence of solution features or confirm potential anomalies to investigate further.

5. References

CIRIA 2001. *Contaminated land risk assessment: a guide to good practice*. CIRIA document reference C552.

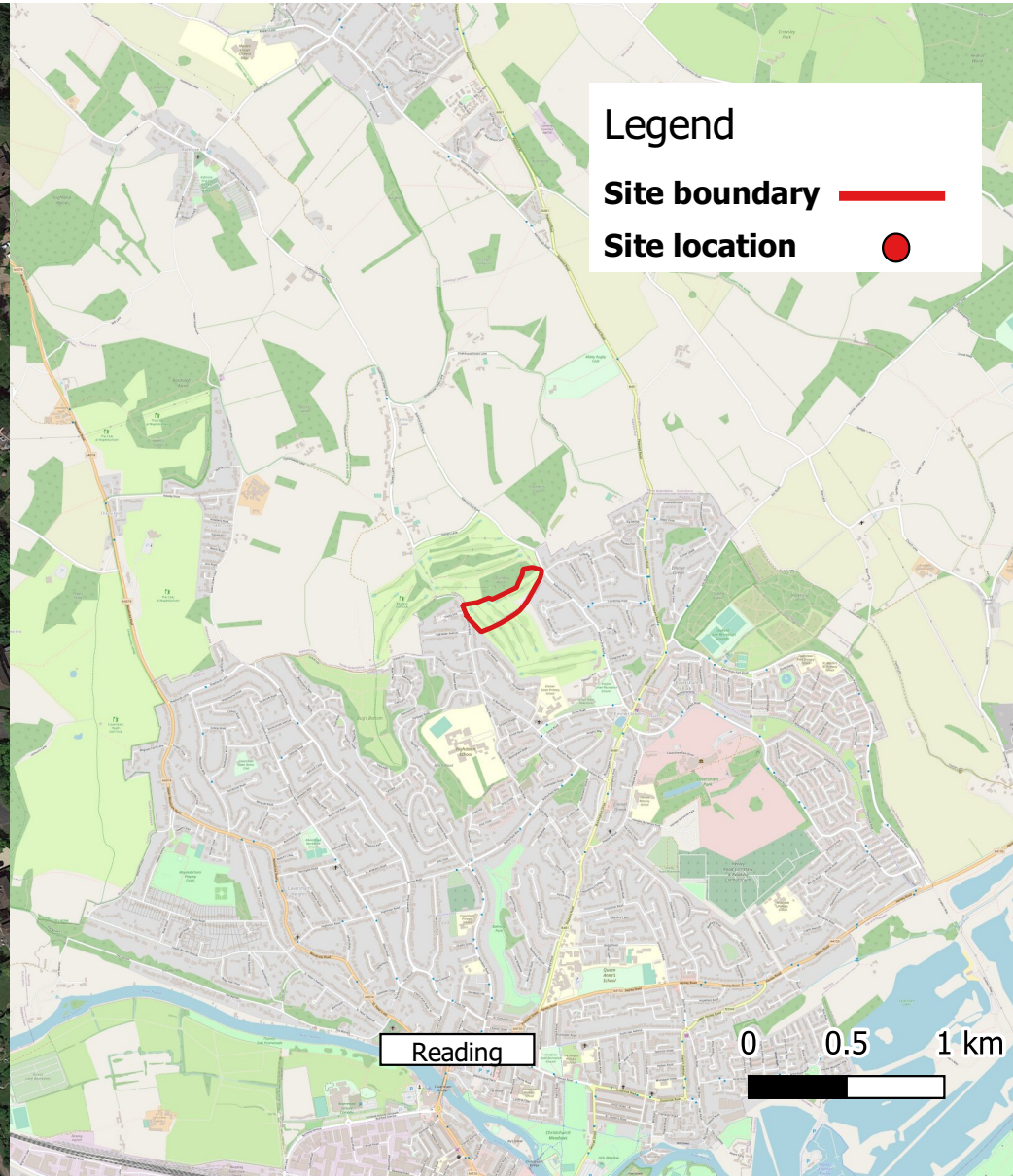


	Figure Title Site location, Reading Golf Course	Client Fairfax (Reading) Limited and RGC (SODC) Limited	Date 08/09/22	Drawn RLW	 AQUA TERRA CONSULTING
		Drawing Number P25033 R1 D01	Scale NTS	Checked JEM	
			Original A4	Revision 1	
		Project Number P25033	Reading Golf Course, Emmer Green		

Report Conditions

This report has been prepared by Aqua Terra Consultants Ltd. (Aqua Terra) in its professional capacity as soil and groundwater specialists, with reasonable skill, care and diligence within the agreed scope and terms of contract and taking account of the manpower and resources devoted to it by agreement with its client and is provided by Aqua Terra solely for the internal use of its client.

The advice and opinions in this report should be read and relied on only in the context of the report, taking account of the terms of reference agreed with the client. The findings are based on the information made available to Aqua Terra at the date of the report (and will have been assumed to be correct) and on current UK standards, codes, technology, and practices as at that time. They do not purport to include any manner of legal advice or opinion. New information or changes in conditions and regulatory requirements may occur in future, which will change the conclusions presented here.

Where necessary and appropriate, the report represents and relies on published information from third party, publicly and commercially available sources which is used in good faith of its accuracy and efficacy. Aqua Terra cannot accept responsibility for the work of others.

Site investigation results necessarily rely on tests and observations within exploratory holes only. The inherent variation in ground conditions mean that the results may not be representative of ground conditions between exploratory holes. Aqua Terra take no responsibility for variation in ground conditions between exploratory positions.

This report is confidential to the client. The client may submit the report to regulatory bodies, where appropriate. Should the client wish to release this report to any other third party for that party's reliance, Aqua Terra may, by prior written agreement, agree to such release, if it is acknowledged that Aqua Terra accepts no responsibility of any nature to any third party to whom this report or any part thereof is made known. Aqua Terra accepts no responsibility for any loss or damage incurred as a result, and the third party does not acquire any rights whatsoever, contractual, or otherwise, against Aqua Terra except as expressly agreed with Aqua Terra in writing. Aqua Terra reserves the right to withhold and/ or negotiate the transference of reliance on this report, subject to legal and commercial review.

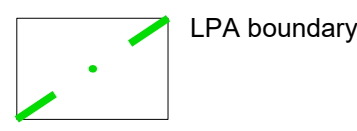
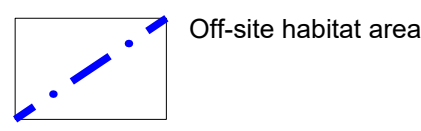
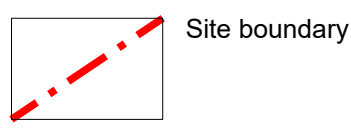


This drawing has been created using the best available information and is not a guarantee of performance or results. It is the responsibility of the client to ensure that the information provided is accurate and complete. The client acknowledges that the information provided is for informational purposes only and is not a guarantee of performance or results. The client acknowledges that the information provided is for informational purposes only and is not a guarantee of performance or results.

Project	25-04-2025	Preliminary Issue	cm	is
Revision	Date	Reason	Drawn	Checked
1	25-04-2025	Preliminary Issue	cm	is

Disclaimer:
1. This drawing is copyright of fabrik. It must not be copied or reproduced without written consent from the owner.
2. Do not scale from this drawing. Only signed dimensions are to be taken from this drawing.
3. All contractors must read and be responsible for taking and checking all dimensions related to the works shown on the drawing prior to fabrication or setting out.
4. This drawing uses coloured lines. Please do not rely on a monochrome copy.

Legend



1. Main site access points
2. Main street
3. Edge / secondary streets
4. Play spaces - LAP / LEAP
5. Youth and young adult spaces
6. Community orchards
7. Open space
8. Woodland planting

9. Woodland edge
10. Attenuation basin
11. Swale
12. Footpath links

fabrik

Project: Kidmore End Road, Reading | 16.1km from London | Hampshire | G234 1HG

Drawing Title: Colour Masterplan

Proposed Issue: Preliminary

Drawn By: cdm

Checked By: ajs

Drawn Scale: 1:750 @ A1

Date of First Issue: Apr | 2025

Revision: P01

Client: Fairfax Properties

Project: Kidmore End Road, Reading | 16.1km from London | Hampshire | G234 1HG

Drawing Title: Colour Masterplan

Proposed Issue: Preliminary

Drawn By: cdm

Checked By: ajs

Drawn Scale: 1:750 @ A1

Date of First Issue: Apr | 2025

Revision: P01

Client: Fairfax Properties