

DESK TOP STUDY REPORT

Site Address:	Prestwick, Ermine Street, Buntingford, Herts, SG9 9RT
Report Date:	November 2023
Project No.:	18610
Prepared for:	LW Developments Ltd
Planning Application	East Herts Council - 3/23/1881/FUL



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LIST OF ABBREVIATIONS

BGS	British Geological Society
CIRIA	Construction Industry Research and Information Association
EA	Environment Agency
EHO	Environmental Health Officer
GL	Ground Level
GW	Groundwater
HESI	Herts & Essex Site Investigations
LAPPC	Local Authority Pollution Prevention and Control
NOS	Not Otherwise Specified (waste material)
NHBC	National House-Building Council
OS	Ordnance Survey
PAH	Poly Aromatic Hydrocarbons
SPZ	Source Protection Zone
TPH	Total Petroleum Hydrocarbons
UFST	Underground Fuel Storage Tanks

DESK STUDY GENERAL NOTES

This report has been prepared based on the findings of investigations into the site conditions using current available data which has been recovered from Envirocheck to provide environmental data in relation to the site and surrounding area. Where possible, local sources have been researched to gain a better understanding of the site conditions. As part of this review, research has been undertaken with the Local Authority and the Environment Agency as to the site condition.

We can confirm that this report has been prepared based on the information gained and that this information is not exhaustive, and that subsequent research may reveal additional facts that may influence the reporting. Where possible, this information has been researched.

All geological information has been researched using the British Geological Society website, (the geology viewer). The disclaimer associated with this portal confirms 'The British Geological Society accept no responsibility for omissions or misinterpretations of the data from their Data Bank as this may be old or obtained from Non-BGS sources and may not represent current interpretation.

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The accuracy of map extracts cannot be guaranteed, and it should be recognized that different conditions on site may have existed between subsequent to the various map surveys.

We can confirm that within the assessment of the site, various websites have been visited and as such, we cannot confirm the validity of these sites and as such, this information is accepted de facto and without prejudice. Anyone relying on these sources does so at their own risk, however, Herts & Essex Site Investigations does undertake all reasonable care to ensure this data is relevant and correct.

It should be confirmed that the extent of review of this report has undertaken a broad review of on site features which would promote a contamination ground risk, however, this does not include ecological features and in particular Japanese Knotweed which should be reviewed under separate cover.

A review of the site will be made to confirm the extent of obvious Asbestos product or sheet materials either on the surface of the site soils or evident above ground, however, does not constitute a full Asbestos Survey by any means. This should be sought under separate cover.

DOCUMENT INFORMATION AND CONTROL SHEET

Client

LW Developments Ltd
PO Box 417
Hertford
Herts
SG13 9LY

Environmental Consultants:

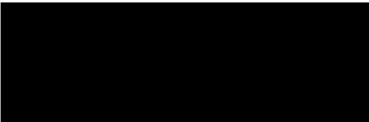
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C.S.Gray

- ONC - Civil Engineering.
- HNC – Civil Engineering.
- P.G. Certificate – Geotechnical Engineering, (Inc. Environmental Engineering)
- P.G. Diploma – Geotechnical Engineering, (Inc. Environmental Engineering)
- Master of Science, (Geotechnical Engineering), (Inc. Environmental Engineering)
- SNIFFER modelling course.
- CONSIM Groundwater Assessment Course.
- (30 Years in Geotechnical and Environmental Engineering)
- Asbestos Awareness Course.
- Non-Licensed Work with Asbestos Including>NNLW.
- Site Supervisors Safety Training Scheme, (SSSTS).
- First Aid Course in Construction – 3 Day Course – 3 years.
- CSCS Labourer Card.

Document Status and Approval Schedule

<i>Issue No</i>	<i>Status</i>	<i>Date</i>	<i>Prepared by: Rebecca Chamberlain Signature / Date</i>	<i>Technical review by: Chris Gray Signature / Date</i>
1	Final	November 2023		

SUMMARY

Client	LW Developments Ltd																
Site Location	Prestwick, Ermine Street, Buntingford, Herts, SG9 9RT																
Existing Development	Open land formally a residential house and associated landscaping. Numerous trees surround the site.																
Proposed Development	The proposed site construction forms the development of five new private residential houses with associated landscaping and access. Plans have been provided as to the extent of these works in the reporting completed below																
Site Settings and Previous Uses	<p>The site is identified as open land from the earliest map record in 1877 until 1923 when residential land was developed on the site/Additional buildings were added in 1976 which remained in place until present day.</p> <p>Surrounding the site, open land is in place. A pond is recorded 50 meters to the south of the site which is infilled in 1976. A farm is located 130 meters to the southeast from the earliest map record until present day. Residential housing is also recorded surrounding the site from 1976 to present.</p>																
Geological and Hydrological Profile	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="2">Geology</th> <th colspan="2">Aquifer Classification</th> </tr> </thead> <tbody> <tr> <td>Made Ground</td> <td>Shallow Made Ground Anticipated</td> <td colspan="2">Not Classified</td> </tr> <tr> <td>Glaciofluvial Deposits</td> <td>Clay over Sandy CLAY</td> <td colspan="2">Secondary Aquifer</td> </tr> <tr> <td>Lewes Nodular Chalk</td> <td>Chalk, (Not Encountered)</td> <td colspan="2">Principal Aquifer</td> </tr> </tbody> </table>	Geology		Aquifer Classification		Made Ground	Shallow Made Ground Anticipated	Not Classified		Glaciofluvial Deposits	Clay over Sandy CLAY	Secondary Aquifer		Lewes Nodular Chalk	Chalk, (Not Encountered)	Principal Aquifer	
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Glaciofluvial Deposits	Clay over Sandy CLAY	Secondary Aquifer															
Lewes Nodular Chalk	Chalk, (Not Encountered)	Principal Aquifer															
Nearest Surface Water Feature	The nearest surface water feature is recorded as on site which is likely formed by a ditch.																
Groundwater Abstractions	No groundwater abstraction wells are recorded within the site area up to 1000 meters away																
Source Protection Zone	The site lies within a Source Zone III Protection Zone. A Source Zone II protection zone is located 999 meters to the north of the site																
Potential Sources of Contamination	<table style="width: 100%;"> <thead> <tr> <th style="text-align: left;"><i>Features On Site</i></th> <th style="text-align: left;"><i>Features Off Site</i></th> </tr> </thead> <tbody> <tr> <td> <ul style="list-style-type: none"> • Access road & Parking – Ruled out as a risk </td> <td> <ul style="list-style-type: none"> • Infilled Pond, 50m, S–Ruled out as a risk </td> </tr> </tbody> </table>	<i>Features On Site</i>	<i>Features Off Site</i>	<ul style="list-style-type: none"> • Access road & Parking – Ruled out as a risk 	<ul style="list-style-type: none"> • Infilled Pond, 50m, S–Ruled out as a risk 												
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Previous Investigations	No reports relating to contaminated land are known to us at the time of writing this report relating to the site.																

Human Health Risk	<p>Limited sources of contamination are recorded within and surrounding the site.</p> <p>A watching brief should be kept as follows and it may be prudent to complete an exploratory investigation to confirm no risks are in place.</p> <p>Should any areas of the site be encountered within the development that appear potentially contaminated through visual or olfactory assessment outside that discussed within this report, consultation with ourselves should be undertaken in order to identify the risk associated with the material.</p>
Ground Water Risk	Limited sources of risk are in place within the site a watching brief should be maintained throughout the development, should any significant pollution or suspect materials be encountered reassessment to the risk should be undertaken
Surface Water Risk	Considering the nature of the feature and the lack of sources of risk direct links between the site conditions are unlikely to be in place.
Vapour Risk	No sources of vaporous contamination are recorded in place.
Land Gas Risk	No sources of land gases are in place for the site area, should significant made ground or organic matter be encountered within the site area reassessment may be required, although for the information collect to date the risk of this is low.
Recommendations	<ul style="list-style-type: none"> • Intrusive shallow based excavation using hand sampler to assess the geological conditions and recover samples. • General exploratory investigation sampling to assess the site. • Visual observations of the subsoil encountered to make initial assessment of the potential risk from contamination. • Watching brief to record assess and report on unexpected contamination. • Based on the above, a risk assessment should be completed if any investigation is completed. This will result in a revised conceptual model based on actual site conditions and confirm the risks in place.

PRELIMINARY RISK ASSESSMENT – DESKTOP STUDY - PHASE 1 REPORT

1 Context and Objectives of this report

1.1 Introduction

We have been asked by LW Developments Ltd to undertake an investigation of the above site in order to assess the potential environmental impact of the existing and historical use of the site on the proposed development sufficient to document the level of risk and impact on future users and the environment.

The client is proposing to develop residential dwellings with gardens, as such the derivation of risk has been assigned as a 'Residential Land Use with Home-grown Produce'.

1.2 Reference to the Current Planning Application Details

An application is in place with East Herts District Council as follows:-

Decision Notice : 3/23/1881/FUL

Demolition of existing buildings, construction of 5 x 3-bedroom chalet bungalows, access road, landscaping and supporting infrastructure.

1.3 Decision Notice Relating to Contaminated Land

4. Prior to the commencement of the development hereby approved a scheme to deal with contamination of land and/or groundwater shall be submitted to and approved by the Local Planning Authority and the development should be implemented in accordance with the approved scheme. The scheme shall include all of the following measures unless the Local Planning Authority dispenses with any such requirement specifically and in writing:

1. A desk-top study carried out by a competent person to identify and evaluate all potential sources and impacts of land and/or groundwater contamination relevant to the site. The requirements of the Local Planning Authority shall be fully established before the desktop study is commenced and it shall conform to any such requirements. Copies of the desk-top study shall be submitted to the Local Planning Authority without delay upon completion.

2. A site investigation shall be carried out by a competent person to fully and effectively characterise the nature and extent of any land and/or groundwater contamination and its implications. The site investigation shall not be commenced until

(i) A desk-top study has been completed satisfying the requirements of paragraph (1) above;

(ii) The requirements of the Local Planning Authority for site investigations have been fully established; and

(iii) The extent and methodology have been agreed in writing with the Local Planning Authority. Copies of a report on the completed site investigation shall be submitted to the Local Planning Authority without delay on completion.

3. A written method statement for the remediation of land and/or groundwater contamination affecting the site shall be agreed in writing with the Local Planning Authority prior to commencement and all requirements shall be implemented and completed to the satisfaction of the Local Planning Authority by a competent person. No deviation shall be made from this scheme without the express written agreement of the Local Planning Authority.

Reason Details are required prior to the commencement of the development to minimise and prevent pollution of the land and the water environment in accordance with Policy EQ1 of the East Herts District Plan 2018.

1.4 Report Objectives

The objectives of the project were as follows: -

- A review of the geological, hydrological and hydrogeological setting of the site, and public domain environmental information to build up an understanding of the site and its environmental setting/sensitivity.
- Review of historical land uses for the site and surroundings with a particular emphasis on identifying potential ground hazards and on-site and off-site contamination sources.
- A visual walkover inspection of the site to review current and recent site activities, the condition of the site, potential ground related hazards and activities or areas that might have the potential to cause ground contamination as well as possible indicators of contamination; and
- Preparation of a Conceptual Site Model (CSM) with a view to identifying potentially significant source-pathway-receptor linkages followed by a qualitative risk assessment.

1.5 Timescales of the Assessment

The timescales for the site investigation process are based on immediate site investigation data and the assessment of the site conditions based on this report at present. The scope of this report which define the following: -

- Any immediate risks identified within the site that may promote a high risk to the immediate site conditions.
- Any current site use features that would promote a risk that required 'quick' action.
- Any construction or medium-term risks within the site which may be present during the construction process within the site.
- Any long-term risks within the site that may require long term assessments or interim monitoring.
- Any risks within the site that may change upon the change in use of the site to form the proposed development.

1.6 Level of Technical Confidence Expected

The scope of this report has been prepared in order to assess the historical impact of the site and any previous site uses on the existing and proposed development scheme. The level of risk will be prepared and assessed based on historical mapping and environmental information which has been gained to support the development of this report.

Whilst this is the case, gaps in map records and information will be in place that would reduce the readers confidence of the information sought. As such, this report has been prepared as a preliminary or Indicative Report with a Medium Confidence Level.

1.7 Management Constraints

The site investigation has been prepared based on a budget and time scales which has been agreed with the client. The desk top study fees have been agreed at this time which will dictate a way forward.

2 Characteristics of the site

2.1 The Site

The site is located within a rural area of Buntingford, Hertfordshire, the details of which are summarised in Table 1 with the location plan of the site shown in Appendix 2, Sheet 1.

Table 1 Site Detail

<i>Site Address:</i>	Prestwick, Ermine Street, Buntingford, Herts, SG9 9RT
<i>Site assessed under</i>	Site Owners Request - Aid as part of planning and warranties
<i>Current use of land:</i>	Residential House and landscaping
<i>Previous use of site, (if known)</i>	As above
<i>Grid Reference</i>	NGR 535510, 230810
<i>Site Area</i>	0.37 Hectares
<i>Local Authority</i>	East Herts Council
<i>Gradient of the site</i>	The site slopes down to the east. From the eastern boundary there is a steeper slope down onto the farm land off site.
<i>Proximity of Controlled Waters, (if known)</i>	The nearest surface water feature is recorded as 92 meters to the east of the site area, where the Tykes Water is recorded as flowing to the north east.

2.2 Existing Site Use

The site is formed by an old residential house which has been mostly demolished and is located to the rear of the site with some old walls in place. The majority of the land surrounding the old house form gardens and the main access driveway which runs from the main road up to the main house. The site has a gradual slope down to the main road from the site.

2.3 Surrounding Land Uses

The surrounding land uses are detailed below: -

- To the north of the site area residential land is in place.
- To the east of the site the main road is in place with open fields beyond.
- To the south of the site area, open land is in place.
- To the west of the site area open land is in place.

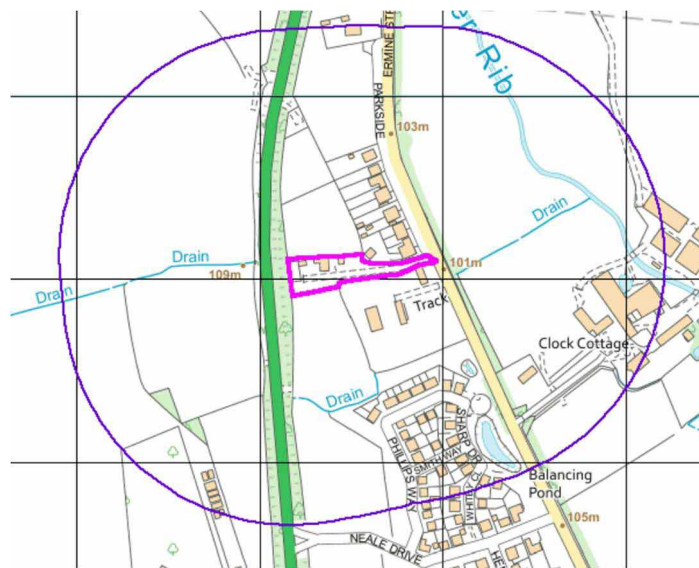
2.4 Site Reconnaissance

The site walk over visit was undertaken in November 2023 on which the weather conditions were recorded as overcast.

Access

Access into the site area is recorded as from the main road, (Ermine Street), where a dirt track leads up and into the site for both pedestrian and vehicle access. The driveway is laid to some loose gravel and has grass verges. Either side of the main access, a trench had been excavated for water main laying and revealed what appeared to be a good quality topsoil with flint gravel. No obvious signs of risk were in place within the trenching.

Site Area



The site is recorded as an irregular shaped parcel of land which runs along from the main road and entering the site through a track leading up and into the site area. Upon gaining access into the site, the site opens out into somewhat of a construction site where the former structure in place, (a residential house), has been demolished and only partially remains. This includes some brickwork and a window frame, although, this has only been retained to retain the existing electric network for the site until it can be removed.

Debris from the demolition of all previous structures has been split into two stockpiles on site, both which appear to contain brickwork, concrete and demolition waste / debris.

The remainder of the entire site area is identified as formally laid to grassed landscape which has been tracked with mechanical excavators through the site clearance works. This has exposed some roots in place across the site.

The site slopes down from the rear of the site to the main road. This is formed by a gradual gradient and does not include any dips or troughs.

Vegetation

No obvious trees are recorded in place within the site. Aerial photography of the site would suggest that some trees and vegetation have been identified within the site area.



Above or below ground fuel or oil storage tanks

By examination of the site no above ground tanks are in place, no features are present to suggest that any below ground fuel tanks would be in place within the site area.

Asbestos Containing Materials

No Asbestos containing materials were reviewed within the site area. We recommend that an asbestos survey of the building be carried out, if not done so already, prior to any further demolition or works on site. A full assessment for asbestos within any made ground will be required in order to fully consider risk from Asbestos.

Surrounding Area

Surrounding the site area trees line the boundary lines of the site but include residential land and an allotment to the north of the site, open land to the east of the site, a small wooded area to the west of the site and residential land to the south.

Site Levels and Ground Cover

The site area forms a generally level area of land, which slopes down to the east.

The site is laid to soft landscaping.

Current site activities

The current site use forms vacant land with no features which would indicate significant risk.

Effluent, Site Drainage and Services

To the northern boundary of the site there is a ditch in place. At the time of the walk over some services were still in place within the site associated with the former building, although their location is not known and are proposed to be made redundant and new to be put in for the proposed development.

2.5 Site Reconnaissance – Photos

Print 1



Print 2



Print 3



Print 4



Print 5



Print 6



Print 7



Print 8



Print 9



Print 10



Print 11



Print 12



Print 13



Print 14



Print 15



Print 16



Print 17



Print 18



Print 19



Print 20



Print 21 View



Print 22 View

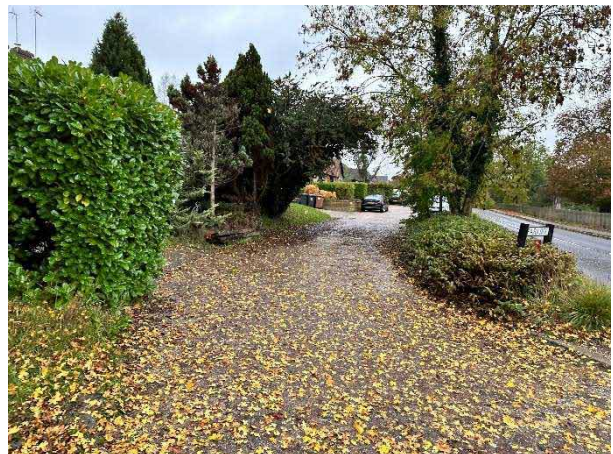


Table 2 Walk Over Inspection Risk

<i>Feature</i>	<i>Location</i>	<i>Elevation</i>	<i>Is A Risk Assessment Required?</i>
Parking / Road Access	Entrance	At GL.	✓

3 Details of Searches Undertaken

Within this report, various searches have been undertaken in order to assess the risk associated with the development of the site from the historical and current use of the site and surrounding area. These include: -

- Environmental Data Search 1:10,000.
- Environmental Data Search 1:2,500.
- Site Sensitivity Maps and Data Sheets.
- Historical Maps.
- Internet Search.
- Local Authority Search –Planning Files.
- Consultation with Site Owner / Architect.

4 Information on Historical and Current Activities on the Site and Surrounding Area

The history of the site’s land-use and development from Victorian times onwards has been researched from Ordnance Survey, (O.S.) maps. Extracts of the O.S. Maps and plans are presented in Appendix 4. Reference to historical maps provides invaluable information regarding the land use/history of the site, but historical evidence may be incomplete for the period pre-dating the first edition and between successive map references.

4.1 Discussion of the Development History

A summary of the historical development of the site and surrounding area based on the information obtained from the above sources is provided in Table 3. It should be noted that these maps are only a small section of time and represent the timescales given in each of the map records. It is highly possible that development or features may have been developed within or surrounding the site which may influence the site, and this should be born in mind when assessing the history of the site.

Table 3 *Historic Maps Assessment*

<i>Date</i>	<i>Scale</i>	<i>On Site Feature</i>	<i>Off Site Features</i>
<i>1877</i>	1:2,500	Open Land	Pond, 50m, S, Farm, 130m, SE
<i>1883</i>	1:10,560		
<i>1898</i>	1:2,500		
<i>1899</i>	1:10,560		
<i>1923</i>	1:2,500	House Constructed with drive	
<i>1923</i>	1:10,560		
<i>1948</i>	1:10,560		Residential Housing, 20m, NE
<i>1960</i>	1:10,000		
<i>1976</i>	2,500	Additional buildings added	Additional houses constructed, 10m, S Pond Infilled, 50m, S
<i>1980</i>	10,000		
<i>1987</i>	2,500		

Table 4 Historic Maps Assessment

<i>Date</i>	<i>Scale</i>	<i>On Site Feature</i>	<i>Off Site Features</i>
<i>1989</i>	10,000		
<i>1993</i>	2,500		
<i>1999</i>	10,000		
<i>Historic Aerial Photo</i>			
<i>2006</i>	10,000		
<i>2023</i>	10,000		

Table 5 *Overview of Historic Map Assessment Risk*

Identified Risk	Distance & Direction	Year	Is A Risk Assessment Required?	Justification
Open Land	On Site	1877 –1923	X	
Residential Housing	On Site	1923 –Present	X	
Additional Buildings	On Site	1976 - Present	X	
Pond	Off Site, 50m, S	1877 - 1976	X	
Farm	Off Site, 130m, SE	1877 - Present	X	
Residential Housing	Off Site, 20m, NE	1948 –Present	X	
Additional Residential Housing	Off Site, 1976 - Present	1976 - Present	X	
Pond Infilled	Off Site, 50m, S	1976 - Present]	

5 *Details of the Intended Future Use of the Site*

The proposed site construction forms the development of five new private residential houses with associated landscaping and access. Plans have been provided as to the extent of these works in the reporting completed below.

6 *References of Planning Applications*

From a review of the East Herts Council web site the following applications is recorded for the site area.

Decision Notice : 3/23/1881/FUL

Demolition of existing buildings, construction of 5 x 3-bedroom chalet bungalows, access road, landscaping and supporting infrastructure.

7 *Discussion with Local Authority*

No discussion with the Local Authority has been completed.

8 *Consultation with Environment Agency*

Consultation has not been made with the Environment Agency at this time. The information gained from Envirocheck and the EA web site has provided sufficient information at this stage. The assessment of the site should take into account the groundwater regime within the site area and the possible risk from both on-site and off-site contamination.

Should heavy or persistent contamination be identified within any Phase 2 or intrusive investigation, consultation will be required and will be undertaken.

9 *Consultation with Appropriate Bodies/Local Sources*

Limited consultation with the Local Authority has taken place a review of the online planning files has been made. No other local sources of information were available at the time of the walk over. This forms the level of assessments made.

10 *Previous Reporting*

No previous reports are known to us at the time of writing this report.

11 *Environmental Settings*

11.1 *Superficial Deposits and Solid Geology*

The ground conditions based on geological maps and BGS information shows the site to be located within an area which is identified as Glaciofluvial Deposits which in turn are recorded as overlying Lewes Nodular Chalk.

11.2 *BGS Boreholes*

A BGS Borehole is recorded a short distance to the south of the site which identifies the geological profile as follows :-

G.L to 0.60 meters – Topsoil

0.60m to 2.20 meters – Firm orange brown sandy silty CLAY with a trace of subangular fine to coarse flint gravel.

2.20m to 10.00 meters – Firm to stiff greyish brown mottled silty CLAY with some subrounded fine to coarse chalk gravel and occasional flint and assorted gravel.

10.00 to 20.00 meters – Very stiff grey silty CLAY.

Table 6 **Geological Information**

<i>Geological Unit</i>	<i>Brief Description</i>	<i>Anticipated thickness, (m)</i>	<i>Aquifer Type</i>
Superficial Deposits/Drift On Site			
Filled/Re-worked ground	Made Ground, (Potentially Contaminated Stratum).	0.5-1.00 meters+	Not Classified
Lowestoft Formation - west	Chalky till, together with outwash sands and gravels, silts and clays	2 meters	Secondary Aquifer
Glaciofluvial Deposits - east	Sand & Gravel	10 meters	Secondary Aquifer
Solid Geology Deposits			
Chalk	Chalk	15m +	Principal Aquifer

11.3 Hydrology

The nearest surface water feature is recorded as on site which is likely formed by a ditch along the northern boundary of the site

The nearest discharge consent is identified as 337 meters to the south east of the site. This is recorded as Sewage Discharges –Final Treated Effluent.

The nearest pollution incident to controlled waters is identified as 284 meters to the south of the site and is identified as Unknown.

11.4 Hydrogeology

The published Environment Agency Groundwater Vulnerability Map of the area indicates the site to be located within an area classified as a Secondary A Aquifer. The underlying geology is recorded as a Principal Aquifer which is formed by Chalk at depth.

Principal aquifers provide significant quantities of drinking water, and water for business needs. They may also support rivers, lakes and wetlands.

Secondary A aquifers comprise permeable layers that can support local water supplies, and may form an important source of base flow to rivers.

No groundwater abstraction wells are recorded within the site area up to 1000 meters away.

The site lies within a Source Zone III Protection Zone. A Source Zone II protection zone is located 999 meters to the north of the site.

11.5 Implication of groundwater

Considering the underlying Secondary A Aquifer, groundwater links are possible and therefore some degree of assessment will be required to classify the extent of risk to a groundwater system, as well as abstraction wells, surface water features and source protections zones surrounding the site area.

In accordance with Environment Agency guidance document: -

- The Environment Agency's approach to groundwater protection, Version 1.2, (February 2018).

The document confirms: -

- "Selecting compliance points for use in land contamination risk assessments the distance to a set compliance point should not exceed 50 metres for hazardous substances or a maximum of 250 metres for non-hazardous pollutants unless there are specific physical constraints on the ability to use the groundwater resource. Any increases above these specified distances may be justified but must be supported by a sustainability assessment that takes into account environmental, social and economic factors."

Considering the above, groundwater risk may be in place if significant contamination or a persistent source of contamination are encountered or recorded within the site area, within the information to date risk is considered low.

11.6 Flooding

The site does not lie within an area which is susceptible to flooding. The land 110 meters to the north of the site is identified a susceptible to Extreme Flooding from Rivers or Sea without Defences.

11.7 Landfill Sites

A historic landfill is identified 384 meters to the south of the site. Deposited wastes in this location are recorded as Inert. A Local Authority Recorded Landfill site is recorded as 501 meters to the south of the site. A Registered Landfill site is identified as 483 meters to the south of the site.

Table 7 *Sensitivity of Environmental Receptors in the Vicinity of the Site*

<i>Receptor Type</i>	<i>Receptor(s)</i>	<i>Sensitivity</i>	<i>Comments</i>
Groundwater	Secondary A Aquifer	Moderate	Possible risk to underlying Gravel Deposits
	Principal Aquifer	High	The principle aquifer is likely to be in place at depth within the chalk
Water Abstraction	Potable Water Supply	Medium	The nearest abstraction well is located 1785 meters to the west of the site
Source Protection Zone	Zone 3	Medium	Possible risk should groundwater and or significant contamination is encountered.
Surface Water	Ditch	Low	Recorded in place along the northern boundary of the site
Flooding	NONE		

12 *Site Drainage and Other Potential Man-Made Pathways*

Drainage is recorded in place, although, the site has not been reviewed for drainage routes. A full drainage assessment may aid in the assessment of the site in relation to pathway creation for pollution to migrate.

13 *Regulatory Data*

Information relating to the potential hazards associated with environmental regulatory controls are summarised in Table 8 and 9. This information is recorded in full within the Envirocheck data provided within Appendix 5. The salient points recorded within this data are re-created below.

Table 8 *Summary of Regulatory Data - Sources*

<i>Data Sources</i>	<i>On Site</i>	<i>Off Site</i>	<i>Distance from site.</i>	<i>Is A Risk Assessment Required?</i>
Discharge Consents	None	Sewage Discharges - Final/Treated Effluent - Not Water Company	337, SE	X
Pollution Incident to Controlled Waters	None	Unknown Pollutant –Significant Incident	284m, S	X
		Miscellaneous - Urban Runoff –Minor Incident	375m, N	X
Local Authority Recorded Landfill Sites	None	A.Monk & Co, Throcking Lane, Cottered	501m, S	X
Registered Landfill Sites	None	A Monk & Co Plc Throcking Lane, Buntingford, Hertfordshire	483m, S	X
Historical Landfill Sites	None	Deposited Waste included Inert Waste	384m, S	X
Potentially Infilled Land	None	Unknown Filled Ground (Pit, quarry etc)	560m, W	X
Radon Potential - Radon Protection Measures	The property is in an Intermediate probability radon area (1 to 3% of homes are estimated to be at or above the Action Level).			X

Table 9 Summary of Regulatory Data - Receptors

<i>Data Receptors</i>	<i>On Site</i>	<i>Off Site</i>	<i>Distance from site.</i>	<i>Is this a potential receptor for risk ?</i>
Nearest Surface Water Feature	Ditch	Stream extending away	On Site]
Water Abstractions	None	General Farming and Domestic	1052m, W]
OS Water Network Lines	Inland river	Inland River –Thames Group.	On Site]
Source Protection Zone	Zone 3	Zone III (Total Catchment): The total area needed to support the discharge.	On Site]

<i>BGS Estimated Soil Chemistry Pollutant</i>	<i>BGS Estimated Soil Chemistry</i>
Arsenic	<15
Cadmium	<1.8
Chromium	60-90
Lead	<100
Nickel	30-45

Table 10 *Geological Hazards*

<i>Geological Hazard</i>	<i>Distance & Direction</i>	<i>Feature</i>	<i>Risk Assessment Required</i>
Non-Coal Mining Areas of Great Britain	On Site		Rare
Collapsible Ground	On Site		Very Low
Compressible Ground	On Site		Very Low
Ground Dissolution Features	On Site		Very Low
Landslide	On Site		Very Low
Running Sand	On Site		Very Low
Shrinking or Swelling Clay	On Site		Low

Table 11 *Summary of Contemporary Trade Entries*

<i>Trade Name</i>	<i>Trade Use</i>	<i>Distance & Direction from Site</i>	<i>Is A Risk Assessment Required?</i>	<i>Comment</i>
NONE			X	
<i>No trades are recorded within 250 meters site, (See Envirocheck Data)</i>				

*NB The above information is taken from the Envirocheck trade directories

14 Identification of Potential Contaminants of Concern and Source Areas

Potential sources of contamination are brought forward for further risk assessment which are detailed in Table 14: -

Table 12 Table of Source Risk

<i>Risk Assessment</i>	<i>Source Risk</i>	<i>Source of Information</i>	<i>Location</i>	<i>Date</i>	<i>Considering Site Specific Pathways</i>	
					<i>Assessment Required.</i>	<i>Method of Assessment</i>
A	Parking / Access Road	Walk Over Survey	Main Access Route	N/A	Possible Soil Risk Possible Groundwater Risk Possible Vapour Risk	Simple soil sampling
B	Infilled Pond, 50m, S	Envirocheck maps	Off Site, 50m, South	1976 - Present	Possible Groundwater Risk Possible Vapour Risk Possible Land Gas Risks Possible Ground Gas Risk	Install Standpipe Vapour and Gas Monitoring.

15 Outline Conceptual Model

What must now be considered is what contamination should be identified as a potential hazard as a result of the use of the site-specific areas. In order to undertake this task, the *Contaminated Land Reports, (CLR10)*, has been used which details some trades and potential sources of contamination. In addition to this, the Department of Environment Industry Profiles have been incorporated which detail trade, and also, specific site usage of the trade and contaminant sources.

The information below incorporates a hazard assessment of the features surrounding the site that could potentially impact on the proposed development. This is based on the information below: -

Table 13 *CIRIA Contaminated Land Risk Assessment Table*

		<i>Consequence</i>			
		Severe	Medium	Mild	Minor
<i>Probability</i>	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

Extracted from CIRIA Publication C552 Contaminated Land Risk Assessment

Table 14 Risk Assessment A

Source (Potential Contaminating Use)	Potential Contaminants	Receptors	Pathways	Associated Hazard, [Severity]	Proposed Site Use Risk Assessment				
					Likelihood of occurrence	Potential Risk	Notes		
Parking & Road Access	TPH's Naphthalene	Site Users Construction Workers.	Direct contact. Inhalation dust and fibers. Dermal contact	Medium	Low Likelihood	Moderate / Low	Risk is unlikely based on walk over survey of good quality soils		
			Ingestion of home-grown produce	Medium	Low Likelihood	Moderate / Low	Risk is unlikely based on walk over survey of good quality soils		
			Ingestion of contaminated water through water main pipework	Medium	Low Likelihood	Moderate / Low	Risk is unlikely based on walk over survey of good quality soils		
			Inhalation of vapours	Medium	Low Likelihood	Moderate / Low	Risk is unlikely based on walk over survey of good quality soils		
			Inhalation of land Gases	Medium	Unlikely	Low	Risk is low		
			Inhalation of vapours through contaminated ground waters	Medium	Low Likelihood	Moderate / Low	Risk is unlikely based on walk over survey of good quality soils		
	Adjoining Landowners			Direct contact. Inhalation dust and fibers. Dermal contact	Medium	Unlikely	Low	Risk is low	
				Ingestion of home-grown produce	Medium	Unlikely	Low	Risk is low	
				Ingestion of contaminated water through water main pipework	Medium	Unlikely	Low	Risk is low	
				Inhalation of vapours	Medium	Unlikely	Low	Risk is low	
				Inhalation of vapours through contaminated ground waters	Medium	Unlikely	Low	Risk is low	
	Controlled Surface Water;			Leaching, lateral migration of shallow groundwater to a target receptor.	Medium	Low Likelihood	Moderate / Low	Risk is unlikely based on walk over survey of good quality soils	
				Ground Water. Abstraction Well.	Leaching, migration through fissures / cracks which may migrate to a groundwater receptor.	Medium	Low Likelihood	Moderate / Low	Risk is unlikely based on walk over survey of good quality soils
	Flora			Plant Uptake Direct Contact	Medium	Low Likelihood	Moderate / Low	Risk is unlikely based on walk over survey of good quality soils	
				Asbestos	Site Users Construction Workers.	Inhalation dust and fibers (from Asbestos within the building)	Severe	Unlikely	Moderate / Low
			Inhalation dust and fibers (from asbestos within the soil)			Severe	Unlikely	Moderate / Low	Risk is low
	Metals Metalloids PAH's	Site Users Construction Workers.		Direct contact. Inhalation dust and fibers. Dermal contact;	Medium	Low Likelihood	Moderate / Low	Risk is unlikely based on walk over survey of good quality soils	
				Ingestion of home-grown produce	Medium	Low Likelihood	Moderate / Low	Risk is unlikely based on walk over survey of good quality soils	
		Controlled Surface Water;			Leaching, lateral migration of shallow groundwater to a target receptor.	Medium	Low Likelihood	Moderate / Low	Risk is unlikely based on walk over survey of good quality soils
					Ground Water. Abstraction Well.	Leaching, migration through fissures / cracks which may migrate to a groundwater receptor.	Medium	Low Likelihood	Moderate / Low
	TPH's Naphthalene	Buildings. Construction Materials. Services		Direct contact with contaminated soils;	Medium	Low Likelihood	Moderate / Low	Risk is unlikely based on walk over survey of good quality soils	
Direct contact with contaminated groundwater				Medium	Low Likelihood	Moderate / Low	Risk is unlikely based on walk over survey of good quality soils		

Table 15 Risk Assessment B

Source (Potential Contaminating Use)	Potential Contaminants	Receptors	Pathways	Associated Hazard, [Severity]	Proposed Site Use Risk Assessment				
					Likelihood of occurrence	Potential Risk	Notes		
Infilled Pond. Located 50 meters to the south of the site.	TPH's Naphthalene CO2, CH4.	Site Users Construction Workers.	Direct contact. Inhalation dust and fibers. Dermal contact	Medium	Unlikely	Low	Distance and small nature of infilling removes risk.		
			Ingestion of home-grown produce	Medium	Unlikely	Low	Distance and small nature of infilling removes risk.		
			Ingestion of contaminated water through water main pipework	Medium	Unlikely	Low	Distance and small nature of infilling removes risk.		
			Inhalation of vapours	Medium	Unlikely	Low	Distance and small nature of infilling removes risk.		
			Inhalation of land Gases	Medium	Unlikely	Low	Distance and small nature of infilling removes risk.		
			Inhalation of vapours through contaminated ground waters	Medium	Unlikely	Low	Distance and small nature of infilling removes risk.		
	Adjoining Landowners			Direct contact. Inhalation dust and fibers. Dermal contact	NO LIABILITY FROM THIRD PARTIES				
				Ingestion of home-grown produce					
				Ingestion of contaminated water through water main pipework					
				Inhalation of vapours					
				Inhalation of vapours through contaminated ground waters					
	Controlled Surface Water;			Leaching, lateral migration of shallow groundwater to a target receptor.					
	Ground Water. Abstraction Well.			Leaching, migration through fissures / cracks which may migrate to a groundwater receptor.					
	Flora			Plant Uptake Direct Contact	Medium	Unlikely	Low	Distance and small nature of infilling removes risk.	
	Asbestos	Site Users Construction Workers.		Inhalation dust and fibers (from Asbestos within the building)				No building in place	
				Inhalation dust and fibers (from asbestos within the soil)	Severe	Unlikely	Moderate / Low	Risk is low	
	Metals Metalloids PAH's	Site Users Construction Workers.		Direct contact. Inhalation dust and fibers. Dermal contact;	Medium	Unlikely	Low	Distance and small nature of infilling removes risk.	
				Ingestion of home-grown produce	Medium	Unlikely	Low	Distance and small nature of infilling removes risk.	
		Controlled Surface Water;			Leaching, lateral migration of shallow groundwater to a target receptor.				
		Ground Water. Abstraction Well.			Leaching, migration through fissures / cracks which may migrate to a groundwater receptor.				
	TPH's Naphthalene	Buildings. Construction Materials. Services		Direct contact with contaminated soils;	Medium	Unlikely	Low	Distance and small nature of infilling removes risk.	
Direct contact with contaminated groundwater				Medium	Unlikely	Low	Distance and small nature of infilling removes risk.		

Table 16 Overview of Risk Assessments - Proposed Site Use

Receptors	Pathways	A	B
		Parking & Access	Infilled Pond, 50m, S
Site Users Construction Workers	Direct Contact, Inhalation of Dust and Fibres, Dermal Contact	X	X
	Ingestion of home-grown vegetation	X	X
	Ingestion of contaminated water through water main pipework	X	X
	Inhalation of vapours from soils	X	X
	Inhalation of vapor from contaminated ground waters	X	X
	Inhalation of land gas vapours	X	X
	Inhalation Asbestos dust and fibers (from Asbestos within the building)	X	X
	Inhalation Asbestos dust and fibers (from asbestos within the soil)	X	X
Adjoining Land Owners	Direct Contact, Inhalation of Dust and Fibres, Dermal Contact	X	No Liability from third parties
	Ingestion of home-grown vegetation	X	
	Ingestion of contaminated water through water main pipework	X	
	Inhalation of vapours from soils	X	
	Inhalation of vapours from contaminated ground waters	X	
Flora	Plant Uptake / Direct Contact	X	X
Groundwater; Abstraction Well & Surface Water	Leaching, lateral migration of shallow groundwater to a River or surface water receptor.	X	No Liability from third parties
	Leaching, lateral migration of shallow groundwater system underlying the site and subsequent abstraction well or SPZ	X	
Buildings	Direct contact with contaminated soils.	X	X
	Direct contact with contaminated groundwater	X	X

*NB: Due to Severe Consequence from Asbestos and Explosive Gases, some risk is assessed and potentially in place and therefore highlighted above.

GW Only: Some risks have been assessed as a direct result of potential mobilisation of groundwater contamination that may influence the site. A pictorial conceptual model has been reproduced within this report to confirm the above findings

16 *Identification of Potential Contaminants of Concern and Source Areas*

Based on the information gained no specific sources of contamination are in place, which are likely to impact on the development site. Within the site area there may be made ground in place although this is unlikely to contain contamination the following assessments are recommended

17 *Next Steps*

Considering the information gathered to date, it may be prudent to complete a general assessment of any fill material encountered within the site area to confirm no risk are in place.

The assessment of the site proposed in this report and the following recommendations which are detailed below have been prepared in accordance with key guidance documents as follows: -

- National Planning Policy Framework.
- British Standards 10175:2011+A2:2017
- Land contamination risk management (LCRM)
- Contaminated Land Report, (CLR11) 11, 'Model Procedures for the Management of Contaminated Land', (2004).
- DEFRA: Environmental Protection Act 1990: Part 2A Contaminated Land Statutory Guidance, (April 2012)
- Environment Agency, (EA), GP3 'Groundwater Protection: Policy and Practice'.

The investigation is proposing to undertake the following at the site: -

- Determine the ground and groundwater conditions.
- Determine if there are any obstructions such as old service and foundations, buried tanks, etc.
- Obtain samples of the made ground, natural soils for contamination testing for a general suite of potential contaminants.
- Visually appraise soils to consider olfactorily or visual presence of contamination factors, risk, vapours or fragments.
- All laboratory testing should be completed to MCERT/UKAS accredited standard.
- All detection limits provided by chemical laboratories must fall below the set screening values

17.1 Soil Assessment

Soil sampling will be completed recovering samples in appropriate containers for analysis by the analytical chemist. All samples will be sent directly to the chemist in cool boxes to retain the integrity of the soil sample.

Table 17 *Soils Assessment - Targeted Sampling*

<i>Feature</i>	<i>Contaminant</i>	<i>Method of Investigation</i>
<i>Spatial Sampling, (General Assessment)</i>	Moisture Content, pH, Electrical Conductivity, Cyanide, (Free), Cyanide, (Total), Organic Matter, Boron, Sulfate, (2:1 water soluble), Chromium, (Hexavalent), Sulfate, (Total), Arsenic, Cadmium, Chromium, Copper, Mercury, Nickel, Lead, Zinc, Speciated PAH's, (EPA Priority 16), Phenols.	Window Sampler Boreholes Hand Auger Boreholes Trial Pits

Upon completion of on-site sampling and the associated chemical analysis, the soil data will be compared against the Generic Assessment Criteria derived by AtRisk Soils which has been purchased as a reviewing standard. This has been prepared by Atkins as Soil Screening Values, (SSV's). Additionally, values will be adopted for screening values using LQM / CIEH –Suitable 4 Use Levels in the absence of Atkins adopted values.

17.2 Groundwater Assessment

The lack of sources reduce the potential of risk to the ground water, therefore the watching brief noted in section 15.5 should be kept.

17.3 Land Gas Assessment

No sources of land gases are in place for the site area, should significant made ground or organic matter be encountered within the site area reassessment may be required, although for the information collect to date the risk of this is low.

17.4 Vapour Risk Assessment

No sources of vapours risks are recorded within the site area.

17.5 Working Brief

During the course of the development it will be the responsibility of the on-site manger to ensure watching briefs are kept. A watching brief consists of a record of:

- Any observations of contamination made during the course of development by any member of site staff, contractor or visitor.
- A photographic record of the key stages of development and key occurrences including any contamination found during the course of the development, the formation levels of excavations, any reduced level dig/mass excavation, formation of landscaped or garden areas, etc.
- Contact the Environmental Engineer and strategic points within the development of the site where contamination validation elements will be required.

In areas of the site where there is a greater chance of finding contaminated soil and/or water an area specific watching brief will need to be kept. Such a brief will need to be completed by an appropriately qualified site manager and/or an environmental consultant. The following table specifies works in specific parts of the site that require an area specific watching brief, identifying who must complete the watching brief.

Table 18 *Watching Brief – Targeted areas for observation*

<i>Area of site</i>	<i>Works to be observed</i>	<i>Person to observe works</i>
Sitewide	General watching brief through any excavations or reduced digs.	Site agent / Contractors

Upon completion of associated works, a written and signed statement will be obtained by the following parties:

- Ground works contractor(s) upon completion of foundations and ground works.
- On site manager upon completion of groundworks and landscaping work.

The written statement must clearly state whether or not evidence of contamination was identified during the course of the development and the action that was taken. An example statement is provided below.

“I am [insert name] from [insert company]. We undertook [insert works undertaken] between the [start date] and [finish date]. During the course of work at [insert site name and address] we observed [delete were not applicable: no potential contamination / evidence of contamination / significant evidence of contamination].

Where contamination is identified

The contamination identified:

[include a description of the observations of the contamination]

[identify the location of the observations of contamination and mark the locations on a plan]

[Who was notified of the observations]

[What action was taken to mitigate/clear up contamination]”

The on-site manager statement must include confirmation of whether all site staff and contractors received an appropriate brief regarding the potential presence of contamination.

17.6 Site Staff Training / Briefing

All site staff, site contractors and, where significant contamination is expected site visitors, will be briefed on the potential presence of land, water or air bourn contamination before commencing work on the site. Apart from any standard Health & Safety practices this will include the following information:

- Health & Safety considerations.
- Asbestos Awareness course.

- The type of land, water or air bourn contamination expected at the development site based on previous use and available site investigation information.
- Any particular areas of the site which are likely to be affected.
- Staff responsibilities under the discovery strategy.

The on-site manager will need to provide written confirmation that site staff were briefed about contaminated land in line with these recommendations.

17.7 *Discovery Strategy*

The discovery strategy sets out the actions that must be taken if contamination is encountered during the course of a development.

A significant observation includes any observation of contamination. Examples of the types of observations that would be considered significant are set out in the following table.

Table 19 *Discovery Strategy – Examples of Observations*

<i>Evidence</i>	<i>Description</i>
Visual	<ul style="list-style-type: none"> • Fuel or oil like substances mixed in with or smeared on the soil or floating on perched, groundwater or surface waters. • Waste materials (refuse, barrels, industrial wastes, ash, tar, etc.) buried at specific location or across the site. • Marked variation in colour. For example red, orange, yellow, green, light or dark blue, etc. may indicate contamination from a variety of contaminants. • Soils including large amounts of ash and clinker where such contamination of soils wasn't expected.
Odours	<ul style="list-style-type: none"> • Fuel, oil and chemical type odours • Unusual odours such as sweet odours or fishy odours
Wellbeing	<ul style="list-style-type: none"> • Light headedness and/or nausea when in excavations, at the working face of an excavation, when visual or olfactory evidence of contamination exists, etc. • Burning of nasal passages, throat, lungs or skin. • Blistering or reddening of skin due to contact with soil

Note: The examples provided in this table are not exhaustive.

The following table sets out the actions that must be taken if significant or suspected land, water or air contamination is observed by site staff, contractors or visitors.

Table 20 *Discovery Strategy – Action to be taken if risks are encountered*

<i>Person observing contamination</i>	<i>To be reported to:</i>	<i>Action to be taken</i>
Site visitor	Must report observations to the site manager	None
Contractor	Must report observations to the site manager	Stop work and where possible make area safe and secure area before reporting to site manager
On site manager	Must report observations to their direct manager, the appointed Environmental Consultant, the Planning Authority and Contaminated Land Officer at the Local Authority	Stop work and where possible make area safe and secure area before reporting to others
Environmental Consultant	Must report observations to the site manager, the Planning Authority and Contaminated Land Officer at the Local Authority	Advise that work stops and where possible that the area is made safe before reporting to others

The following table identifies other organisations that may need to be contacted in an emergency or where pollution of controlled waters or nuisance is occurring.

Table 21 *Discovery Strategy – Organisations to be contacted if risks are encountered*

<i>Occurrence</i>	<i>Description</i>	<i>Contact</i>
Risk to the public	If at any point residents, the public or others may be at risk as a result of contamination found during the course of investigation, remediation or development works	<ul style="list-style-type: none"> · Contact the emergency services if there is a risk to life · Contaminated Land Officer/Planning Authority · Health & Safety Executive
Nuisance to residents/the public	If a nuisance has been or is likely to be caused to nearby residents, the public and others –for example odours, dust, noise, vibration, etc.	<ul style="list-style-type: none"> · Pollution Control Team at the Local Authority (and other council's where necessary)
Pollution of controlled waters	If any surface, culverted or groundwater has been polluted – for example slurry, contaminated soil/water or a chemical spillage entering a river or canal.	<ul style="list-style-type: none"> · Environment Agency · Planning Authority and Contaminated Land Officer at the Local Authority
Pollution of adjoining land	If land outside the boundary of the development site is polluted from site activities –for example slurry, contaminated soil/water or a chemical spillage	<ul style="list-style-type: none"> · The owner of the land · Planning Authority and Contaminated Land Officer at the Local Authority

APPENDIX ONE

CONCEPTUAL MODEL

Prestwick, Ermine Street, Buntingford, Herts, SG9 9RT

Site Conceptual Model - Proposed Site Plan

Potential Pathways

Human Health

- ① Direct contact with contaminants in soil/dust or water
- ② Inhalation of contaminants through soil/dust/particles
- ③ Dermal Contact
- ④ Ingestion of home grown produce
- ⑤ Ingestion of contaminated water through water main pipework
- ⑥ Inhalation of Vapours From Soils
- ⑦ Inhalation of Vapours from Groundwater
- ⑧ Migration to off site Adjoining Land Owners

Flora

- ⑨ Plant uptake & direct contact with soil

Controlled Surface Water, Ground Water & Abstraction Well

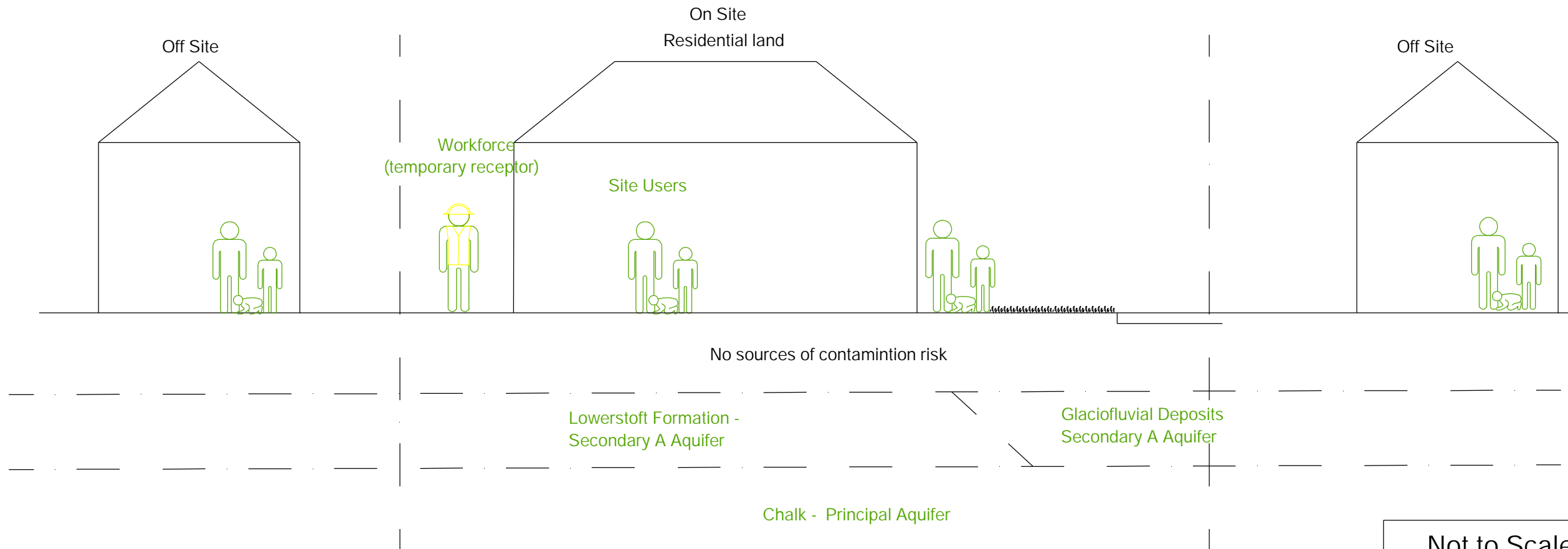
- ⑩ Leaching, lateral migration of shallow groundwater to a target receptor

Off Site Sources

- (A) Migration of contamination to the site area
- (B) Migration of land gases/ vapours to the site area
- (C) Migration of contaminated groundwater to the site area

Key

- Purple =Possible pathways
- Green =Possible receptors
- Red =Possible sources



Not to Scale
Sketch No. : DTS / 18610 / 01 / 01

APPENDIX TWO

SITE PLANS

Prestwick, Ermine Street, Buntingford, Herts, SG9 9RT

Location Plan

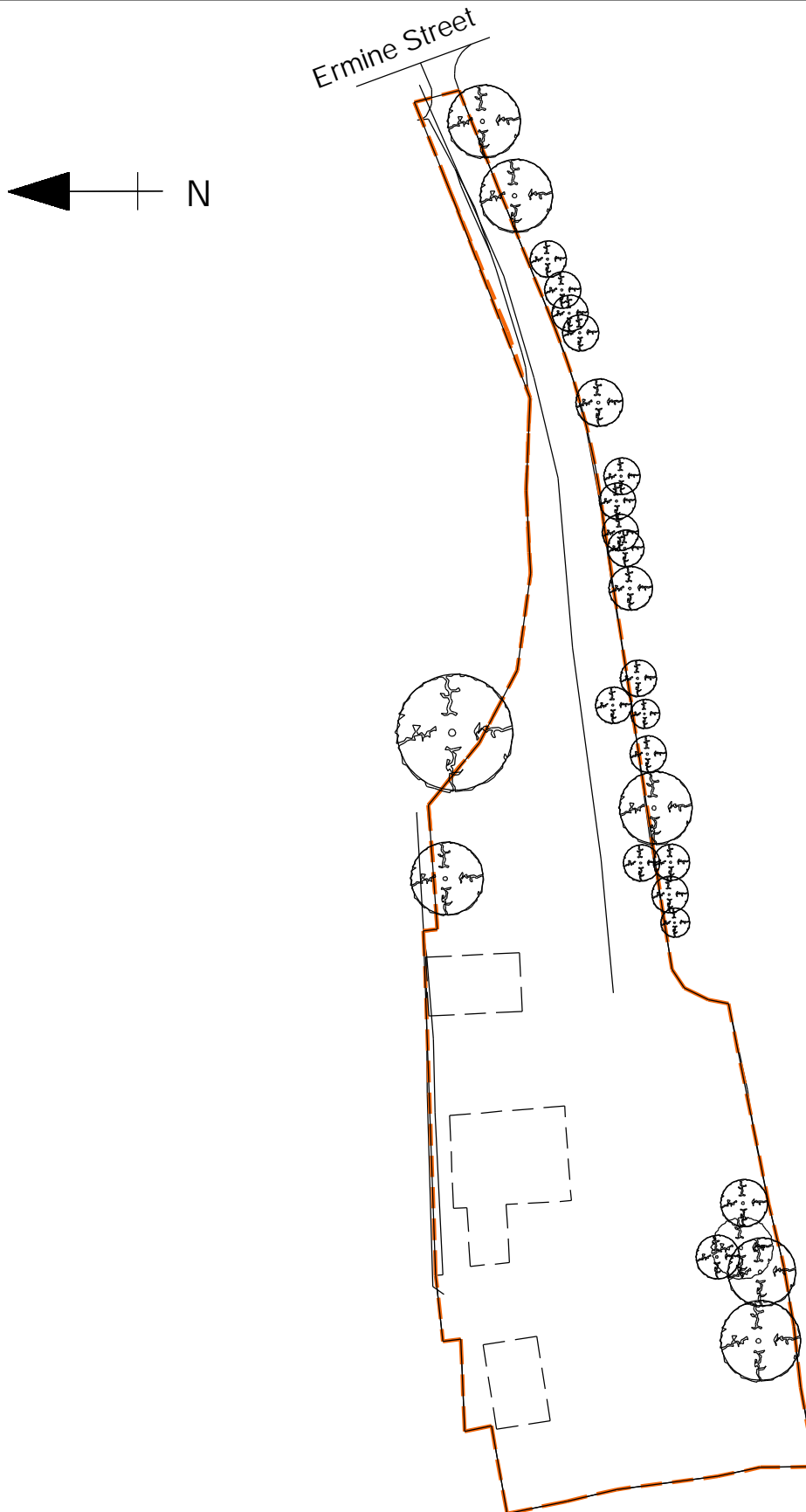


The Site



Prestwick, Ermine Street, Buntingford, Herts, SG9 9RT

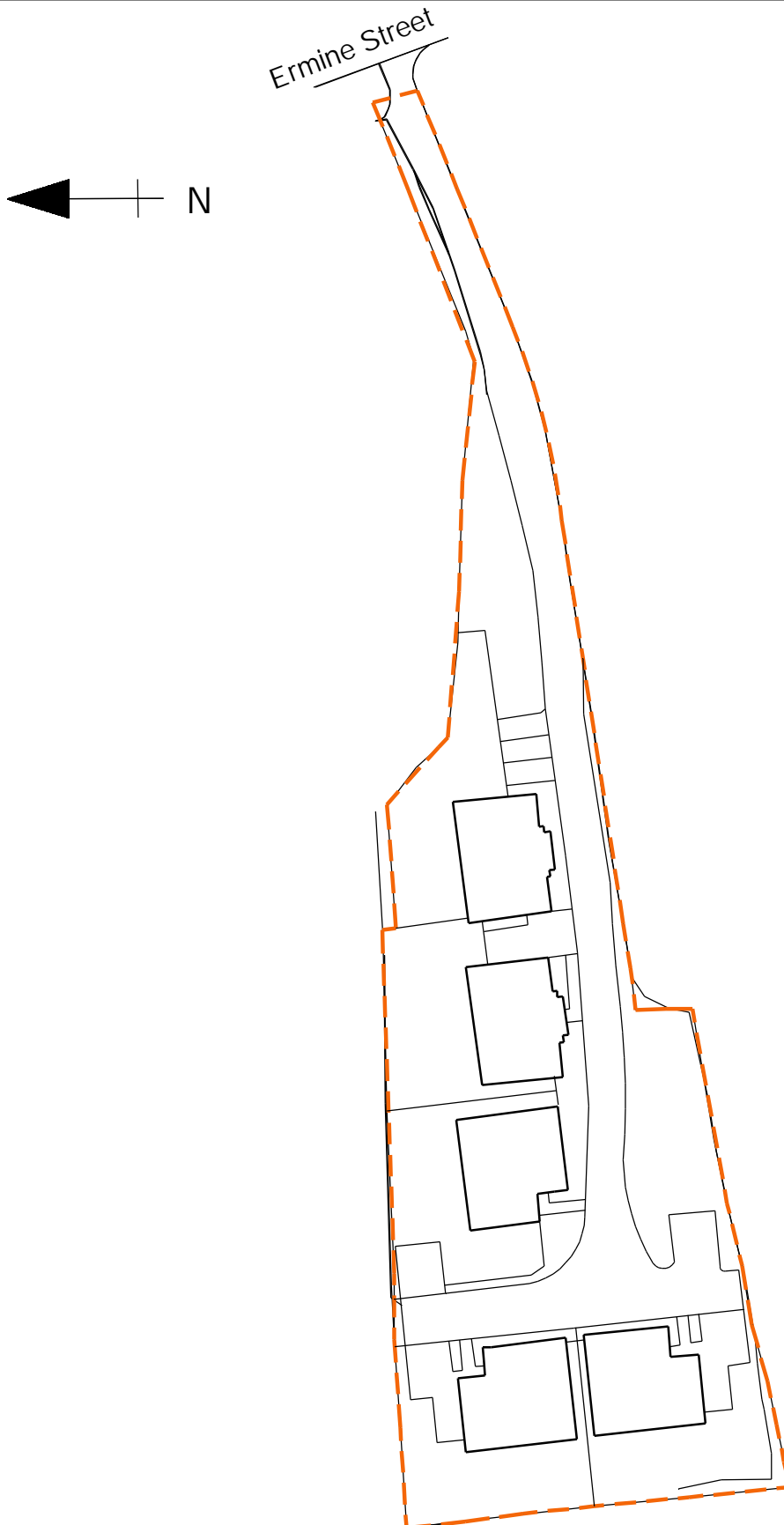
Existing Site Plan



Not to Scale
Sketch No. : DTS / 18610 / 02 / 02

Prestwick, Ermine Street, Buntingford, Herts, SG9 9RT

Proposed Site Plan



Not to Scale
Sketch No. : DTS / 18610 / 02 / 03