GEOTECHNICAL ENGINEERS
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Desk Study Report

Richborough

Newbold Verdon Phase 2

February 2024

Ref: PJS24-0012-DOC-0001

Executive Summary

Instruction	In February 2024, PJS Geotechnical Engineers Limited (PJSG) were instructed by Richborough Estates (the Client) to undertake a Geo-Environmental Desk Study report for a site at land off Brascote Lane, Newbold Verdon, Leicestershire, LE9 9LE (the site).
Proposed Development	Potential future development proposals for the site are understood to comprise a residential development.
Site Description	The site predominantly comprises agricultural fields devoid of any buildings.
Site History	The site has remained undeveloped prior to 1885 with no discernable change up to the present day. A pond was however historically located in the south-west corner of the site which was indicated to have been in-filled in the late-1950s which could present a localised source of unidentified contamination / ground gas arising from any in-fill materials. A footpath was also historically located across the east until the mid-1980's which could represent a source of Made Ground. An historical tank record (dated 1991) has also been identified for the land adjacent north potentially related to a fuel tank present at the adjacent residential development.
Geology	<u>Superficial Drift Deposits</u> • Alluvium (clay, silt, sand and gravel) - mapped underlying the southern boundary of the site along the line of the stream. • Glaciofluvial Deposits (sand & gravel) - mapped underlying the majority of the site aside from along the southern boundary. • Oadby Member (Till) - mapped adjacent south and is likely to be present at depth below the site. <u>Bedrock</u> • Gunthorpe Member (mudstone) - mapped underlying the entire site and near vicinity.
Hydrogeology	• Secondary A Aquifer - Relates to the superficial Glaciofluvial Deposits and alluvium mapped under the site / in the vicinity. • Secondary B Aquifer – Bedrock. • The site is not located within a SPZ.
Hydrology	An inland river is located along the southern boundary which was identified during reconnaissance to comprise a surface water stream, flowing to the west.
Environmental Regulatory Records	• Two historical landfill records located within 500m of the site boundary. However, given the distance and / or age of fill, these landfills are considered unlikely to impact the site via migration of landfill gas. • A licensed discharge to controlled waters (sewage discharges for sewer storm overflow) located ~15 west of the site. However, discharge consents consent will contain conditions and limits to the discharge and as such, are considered unlikely to impact the site from unathorised discharge. • A minor pollution incident occurred in 2001 involving gas and fuel oils impacting the surface water stream located in the west corner of the site. However, surface water is indicated to flow towards the west away from the site which would carry any residual contamination downstream. As such, due to the age, severity and location of this pollution incident, it is considered unlikely to have the potential to impact the site.
Unexploded Ordnance (UXO)	Low risk; no further assessment considered warranted.
Mining Risk	Based on the available information, the site is not at risk from coal mining / non-coal mining activities.

Potential Contamination Sources	The assessment has identified limited potential on and off-site sources of localised contamination associated with the historical / current land uses identified which may represent localised sources of heavy metals, hydrocarbon fractions, PAHs, asbestos fibres & ACMs to have impacted the site.
Human Health Contamination Risk Assessment	Where localised on-site and off-site potential sources of contamination have been identified, the preliminary risk assessment has indicated that, in the absence of any mitigation measures, the site poses a **LOW / MODERATE** risk to human health in these areas until proven otherwise. The majority of the site is however currently in use as agricultural farmland. As such, there is considered to be a **LOW** risk to Human Health end users / construction workers based on redevelopment of the site for a residential end use.
Controlled Waters Risk Assessment	The preliminary risk assessment has indicated that the site poses a **LOW** risk to a Controlled Waters. There is a stream located on the southern boundary that is considered sensitive to site contamination; however, given the lack of significant contamination sources present, the risk to the stream is considered low.
Hazardous Ground Gas Risk	**LOW / MODERATE** risk associated with hazardous ground gas. Gas and groundwater monitoring on 6 No. occasions over 3-month period is recommended (CIRIA C665).
Vapour Risk	The risk of encountering vapour's on-site is generally **LOW**. However, the potential exists for a localised **LOW / MODERATE** risk of vapours to impact the site / site boundaries / groundwater under the north of the site arising from leaks and spills of fuels associated with a former off-site tank located adjacent north that could have contained fuel.
Radon	The site is not in a radon area; radon protection measures not required.
Ecological Risk	**LOW** risk from potential impacts from identified contamination sources and proposed construction to ecological receptors.
Ground Stability Hazards	Moderate compressibility risk associated with Alluvium mapped on the southern boundary which might also be susceptible to running sand conditions.
Geotechnical Summary	Strip or trenchfill foundations may be appropriate for the majority of the site, subject to an assessment of loadings of the proposed structures and verification of the ground conditions by intrusive investigation. Localised deepening of foundations/alternative foundations may also be required, coinciding with any potential soft compressible alluvial deposits, loose sand and gravels and if affected by the influence of trees. The underlying mudstone bedrock (MMG) deposits are noted for potentially containing pyrite and elevated sulphates. It is therefore recommended that appropriate classification testing of the bedrock material should be undertaken as part of the site investigation.
Drainage	Areas of the site underlain by superficial sand and gravels could potentially be suitable for drainage; however, if mudstone bedrock is encountered at shallow depth, then drainage may be limited. This preliminary assessment should be confirmed by undertaking infiltration testing on site in accordance with BRE365 guidance.
Recommendations	An intrusive site investigation should be undertaken to confirm ground conditions underlying proposed development, to confirm suitable foundation solutions and to confirm the contaminative status of the site. Investigation works should specifically target any identified potential sources of contamination / compressible strata.

Documents Issue Record

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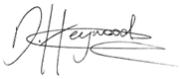
Final	-	19/02/24	Daniel Heywood BSc (Hons)	Adrian McVey BSc (Hons)	Adrian McVey BSc (Hons)
					

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1 Introduction

1.1 Instruction

In February 2024, PJS Geotechnical Engineers Limited (PJSG) were instructed by Richborough (the client) to undertake a Geo-environmental Desk Study at land adjacent to The Pastures, Arnold's Crescent, Newbold Verdon, Leicestershire, LE9 9LD (the site).

A site location plan (PJS24-0012-DR-0001) is included within the drawings section of this report.

1.2 Proposed Development

Development proposals for the site are understood to comprise a residential development. However, no proposed development layout is available at this stage for inclusion in this report.

1.3 Objectives

The purpose of the Geo-Environmental Desk Study is to collect information in order that an 'Initial Conceptual Site Model' (ICSM) can be developed. The ICSM considers potential contaminant sources, pathways and receptors, defined as a contaminant linkage.

The Desk Study and has been undertaken in accordance with the procedures described in Land Contamination Risk Management (LCRM) 2020, British Standard 'Code of Practice for Ground Investigations' (BS5930:2015+A1:2020) and BS 10175:2011+A2:2017 "Investigation of potentially contaminated sites".

The main objectives of this assessment are outlined below:

Table 1-1 Objectives

Objectives
Undertake a Desk Study to assess historical activities at the site and in the surrounding area with respect to their potential to impact on the site and surrounding environment.
To characterise the geological, hydrogeological and environmental setting of the site.
Undertake a Preliminary Risk Assessment (PRA) and develop and rationalise an ICSM which establishes whether there are any potentially unacceptable risks associated with potential land contamination.
Provide a preliminary assessment of potential foundation options and drainage characteristics.
Provide conclusions as to the perceived geo-environmental condition of the site with respect to ground related hazards.
Make recommendations for any investigation deemed necessary.

2 The Site

2.1 Site Description

A site walkover was undertaken by a PJS representative on 15th February 2024 to provide a general description of the site and to identify any significant constraints associated with development of the site. Detailed surveys such as structural, wildlife or tree surveys were outside the scope of this report.

A site features plan (PJS24-0012-DR-0002) is provided within the drawings section of this report. Photographs of the site are included as Appendix A.

A detailed description of the site and overview of the main features observed during the site walkover is presented in the table below. Reference has also been made to satellite imagery where available.

Table 2-1 Summary of Site Information

Specifics	Details
Location	Land adjacent to The Pastures, Arnold's Crescent, Newbold Verdon, Leicestershire, LE9 9LD.
Site Centre Coordinates	444839E, 303290N.
Approximate Site Area	7.04 Hectares (Ha).
Current Site Use	Open grassland surrounded by mature hedgerows and trees.
Topography	Land appears highest in the north-east of the site sloping towards the lowest point of the site in the south-west.
Surface Conditions	Grass vegetation overlies the whole site. Water logged soils are recorded along the southern and western boundaries.
Ground Stability Hazards	None noted.
Existing Buildings / Structures	No buildings were observed on site. A small wooden shed was observed just within the northern boundary, appearing to be associated with the neighbouring property (The Pastures). A small concrete plinth has been observed in the eastern portion of the site with an unknown use.
Services / Utilities	A drainage cover was observed in the northern portion of the site. No other services were observed on site. Overhead services and a drainage ditch run east to west adjacent to the site within the highway verge.
Access & Security	Access on foot via a public footpath is suggested, with parking on Barbara Avenue to the north. Vehicle access is restricted through a locked gate situated on the eastern boundary of the site. The track leads to a private yard with padlocked gated restriction. Access will need to be confirmed for any future required vehicular access.
Fuel Tanks / Storage	None observed.

Specifics	Details
Energy Features	None observed.
Asbestos Containing Materials (ACMs)	None observed on site.
Evidence of surface staining & odours	None noted.
Vegetation / Invasive Plants	No assessment has been made for the presence of pernicious plant species e.g. Japanese Knotweed, Giant Hogweed, within the remit of this investigation. It is recommended a specialist arboriculture survey be undertaken prior to design works commencing.
Existing Boundaries	Hedgerows and trees along the boundaries.
Surrounding Land Use	• N – Public Road (Arnold's Crescent) and residential properties • E – Agricultural fields, public footpath, river and cricket club • S – Agricultural fields, river and farm complex • W – Allotments and residential properties
Surface Water Features	A river has been observed to flow westward, along the southern boundary. The river on the southern boundary is a spur of a river, seen to flow both east to west and south to north adjacent to the site's eastern boundary.
Potential Contamination Sources from Reconnaissance	Potential for leaks / spills of fuels / oils to have occurred from vehicles accessing site when stockpiling manure in the north-east, from the track adjacent to the eastern boundary. The track itself may present a potential source of contamination dependent on the materials used to construct the track. On the northern boundary of the site a pile of garden waste was noted to be present and evidence of recent burning was present. This has the potential for PAH contamination. Adjacent dwelling (The Pastures) to north – potential for fuel storage tanks to be present.
Identified Receptors from Reconnaissance	Identified receptors observed include the water feature to the south and east and flora and fauna within the site boundary.

3 Historical Review

3.1 Ordnance Survey Map Review

Historical Ordnance Survey (OS) maps (presented in Appendix B) have been reviewed for the site and surrounding area, at 1:1,250, 1:2,500, 1:10,000 and 1:10,560 scale dating from 1885 – 2024. The pertinent historical features and changes in land use over time both on and off-site are summarised in the table below. All distances quoted are approximate.

Table 3-1 Summary of Site Development History

Mapping Dates & scale	Pertinent Features On-Site	Pertinent Features Off-Site
1885 – 1886 **[1:10,560 & 1:2,500]**	The site comprises six undeveloped agricultural fields, some of which are tree lined and form part of larger fields located on the adjacent land. A stream (trending east – west) is located along the southern boundary flowing towards the west. A pond is present in the south-western area of the site located along the stream.	Allotment gardens are mapped adjacent south-west. Numerous ponds are located within 250m of the boundary, the closest ~60m south. The remainder of the surrounding area predominantly comprises undeveloped agricultural land with sporadic residential properties and ponds located in the near vicinity. The village of Newbold Verdon is located >250m north.
1901 – 1904 **[1:10,560 & 1:2,500]**	Trees no longer shown along field boundaries on site.	No significant change noted.
1914 – 1919 **[1:10,560 & 1:2,500]**	No significant change noted.	Allotments are located adjacent south-east. Unspecified buildings are located ~20m north and ~50m north.
1930 – 1931 **[1:10,560 & 1:2,500]**	No significant change noted.	Allotments south-east no longer indicated.
1950 – 1955 **[1:10,560]**	Some of the field boundaries are noted to have changed.	Minor residential development has occurred 100m to >250m north-west.
1958 – 1966 **[1:10,560 & 1:2,500]**	By 1958, a footpath is located in the eastern area of site trending roughly north-south. The pond located in the south-west is no longer present, presumed in-filled. A sewage works is located ~450m west.	By 1958, both of the unidentified structures ~20m and ~50m north no longer mapped. A road is located ~120m to the west identified as Brascote Lane. Gilberts Farm is denoted ~250m north-west; however, associated farm buildings were present on the land prior to the earliest available mapping dated 1886.

Mapping Dates & scale	Pertinent Features On-Site	Pertinent Features Off-Site
1972 – 1980 **[1:10,000 & 1:2,500]**	The field boundaries largely represent the boundaries of present day. The footpath located in the east is denoted as a track. The sewage works ~450m west has increased in size.	Vast residential development has occurred adjacent north. Gilberts Farm previously present ~250m north-west has been redeveloped for residential housing. A residential dwelling is located adjacent north identified as The Pastures.
1984 – 1989 **[1:2,500]**	The track no longer crosses the site and now runs along the eastern boundary.	No significant change noted.
1991 – 2010 **[1:2,500, 1:10,000 & 1:1,250]**	No significant change noted.	No significant change noted.
2010 **[1:10,000]**	No significant change noted.	No significant change noted.
2024 **[1:10,000]**	A woodland is indicated in the western-most area of site.	No significant change noted.

3.2 Historical Land Use Features

Aside from the above, the GroundSure report includes specific pertinent historical industrial land use features that are potentially within an influencing distance of the site in relation to contamination risks. This is generally based on historical land use features located within 500m of the site boundary which have been digitised from historical OS mapping at various scales.

A summary of the historical land use features that could impact upon the site is given in the table below.

Table 3-2 Historical Potential Contaminative Land Use Features

Historical Land Uses (Digitised from OS Mapping)	Distance	Comments
Historical Tanks	Closest to site: ~1m N listed as an unspecified tank dated from 1991. No further tank records listed within 250m of the boundary.	The tank record could potentially be related to a fuel tank located at the adjacent residential development (The Pastures). Potential exists for localised fuel impact to the site's boundary associated with leaks / spills of fuels should the tank contain fuel.

Historical Land Uses (Digitised from OS Mapping)	Distance	Comments
Historical Industrial Potential Contaminative Land Use Features	Records within 250m of the site relate to an unspecified historical windmill located ~240m south-west dated 1885 to 1904.	Negligible risk to the site given the age and historical land use.
Historical Energy Features	Closest to site: An ESS located ~60m N dated from 1972 to 1991. No further ESS records listed within 250m of the boundary.	Potential to contain PCB's due to the age of installation. However, considered unlikely to impact the site given the distance and any internal leaks would likely be localised to the source.
Historical Garages	Closest to site: ~430m NE.	No risk to site.

KEY: N – North, S – South, E – East, W – West

The above historical land use records essentially confirm the findings of the historical mapping review presented in Table 3-1. However, of particular importance is the presence of an historical unspecified tank that was indicated to have been present on land adjacent north (dated 1991) which is not apparent on historical maps.

The remainder of the historical land use features identified within the GroundSure report are not considered to pose a significant risk to site and will therefore not be considered further.

3.3 Historical Aerial Photographs

Aerial photographs dated 1999 to 2022 are presented within the Groundsure Report which indicates the site to be unchanged from historical mapping and comprises a parcel of undeveloped agricultural land. Trees are noted along the southern boundary and numerous trees are also apparent in the west corner of the site as noted on the 2024 historical maps.

Aerial photographs also indicate the surrounding area to be essentially unchanged from historical mapping and comprises residential development located adjacent north, and undeveloped agricultural land to the south. However, a recreation ground is also located adjacent east from 1999 up to 2002 which is not apparent on historical mapping.

The GroundSure Insight Report is contained in Appendix C.

3.4 Historical Summary

The key on-site and off-site historical land use features identified during the review with the potential to impact on the site are summarised in the table below:

Table 3-3 Historical Summary – Main Potentially Contaminative Land Features

Historical Land Uses	Location / Distance	Historical Period
On-Site Land Uses		
Agricultural land	Whole site	1885 - Present
Infilled pond	South-west	Infilled circa. 1958.
Track	Eastern boundary	Existing.
Off-Site Land Uses		
Agricultural land use	~250m of the boundary.	1885 to present
Tank	Adjacent north.	1991.
Numerous in-filled ponds.	~250m of the boundary.	Various.
Farm	~250m north-west of the boundary.	1886 – 1972.
Sewage Works	~450m west.	1958- Present

As noted above, the site has remained undeveloped prior to 1885 with no change up to the present day. A pond was historically located in the south-west corner of the site which was indicated to have been in-filled in the late-1950s which could present a localised source of unidentified contamination / ground gas arising from any in-fill materials. A track is located across the eastern boundary and could represent a source of Made Ground.

The historical review has also identified an historical tank record (dated 1991) located on land adjacent north potentially related to a fuel tank present at the adjacent residential development. The potential therefore exists for localised impact to the site's boundary to have occurred associated with leaks / spills of fuels from the tank.

The remainder of the surrounding land uses identified above are considered unlikely to have the potential to impact on the site environment when considered in the context of the ICSM.

4 Geology, Hydrogeology and Hydrology

4.1 Information Sources

Information regarding the geology, hydrogeology and hydrology in regard to the site's setting has been obtained via a GroundSure Report and the BGS Geology of Britain Viewer. Only the information considered pertinent to the site has been included in this report.

A copy of the GroundSure Report is included in Appendix C.

4.2 Geology

Geological information pertinent to the site is summarised in the table below reviewed at a scale of 1:10,000 and 1:50,000.

Table 4-1 Summary of Site Geology

Geological Type	Name & Description	*Location & Distance
Artificial Deposits	Made Ground	None recorded on site or in the vicinity.
Superficial Geology	Glaciofluvial Deposits, Mid Pleistocene – sand & gravel.	Mapped underlying the majority of the site aside from the southern boundary (see below)
	Alluvium - clay, silt, sand and gravel.	Mapped underlying the southern boundary of the site along the line of the stream.
	Oadby Member - Till	Mapped adjacent south and is likely to be present at depth below the site.
Bedrock Geology	Gunthorpe Member – mudstone of the Mercia Mudstone Group (MMG).	Mapped underlying the entire site and near vicinity.

**Up to 100m distance from the site boundary where relevant.*

4.3 Landslips

There are no landslip records for the site or within 500m of the site boundary.

4.4 Bedrock Faults & Linear Features

There are no faults or linear features mapped on site or within 500m of the site.

4.5 Historical Borehole Records

There are no pertinent historical BGS borehole records on or within 250m of the site boundary.

4.6 Estimated Soil Chemistry

The soil chemistry estimated at the site is detailed in the table below, based upon rural topsoil data collected at a sample density of approximately 1 No. sample per 2 km^2.

Table 4-2 Estimated Soil Chemistry

Arsenic (mg/kg)	Lead (mg/kg)	Cadmium (mg/kg)	Chromium (mg/kg)	Nickel (mg/kg)
15	100	1.8	20 -90	15 - 30

4.7 Hydrogeology

A summary of the hydrogeological setting of the site is presented below,

Table 4-3 Summary of Hydrogeological Conditions

Details	Location & Distance	Summary / Comments
***Superficial Aquifers**		
Secondary A	On-site and present within 250m of the boundary mostly adjacent north.	Relates to the superficial Glaciofluvial Deposits and alluvium mapped under the site / in the vicinity.
Secondary Undifferentiated	On-site and present within 250m of the boundary mostly adjacent south.	Relates to the superficial Till deposits mapped adjacent south.
***Bedrock Aquifers**		
Secondary B	On-site and present adjacent in the vicinity.	Relates to the Gunthorpe Member mudstone deposits.

Details	Location & Distance	Summary / Comments
Groundwater Vulnerability & Flow		
Superficial Deposits	On-site	High vulnerability defined as areas able to easily transmit pollution to groundwater. They are likely to be characterised by high leaching soils and the absence of low permeability superficial deposits.
Bedrock Deposits	On-site	Medium vulnerability; defined as intermediate between high and low vulnerability.
Groundwater Flow	-	Based on the local topography, groundwater is likely to flow to the south / south-west.
Abstractions, Source Protection Zones & WFD Groundwater Bodies.		
Groundwater Abstractions	No current records within 1km; all records are listed as historical.	-
Potable Groundwater Abstractions	No current records within 2km. Records are listed as historical.	
Source Protection Zones (SPZ)	Not within 500m of an SPZ	Source Protection Zones define the sensitivity of an area around a potable abstraction site to contamination.
Water Framework Directive (WFD) Groundwater Bodies	On site	Soar – Secondary Combined - good chemical rating and good overall rating in 2019.

**Definition of the aquifer terms are defined in the GroundSure report.*

Given the available information, groundwater is not considered highly sensitive to any potential contamination sources on site. Protection of groundwater resources should however be taken into consideration during any proposed redevelopment works undertaken at this site.

4.8 Hydrology

The table below provides a summary of the hydrological conditions at the site.

Table 4-4 Summary of Hydrology

Details	Records, Location & Distance	Summary / Comments
Surface Water Features – OS Mapping and Reconnaissance.	1 No. records on-site.	The on-site entry relates to a surface water stream located along the southern boundary identified to be present during site reconnaissance. The stream arises from a point circa 500m east of the site and flows along the southern boundary and off-site towards the west and south-west beyond >500m distance form site.
Surface Water Flow	-	Based on the local topography and available mapping, surface water in the stream located along the southern boundary has been observed to flow towards the west.
WFD Surface Water Bodies / Water Quality	On-site.	Thurlaston Brook Catchment (trib of Soar) located on-site failed the chemical rating, and a poor ecological rating and overall rating in 2019.
Surface Water Abstractions	No records within 1km.	-

KEY: N – North, S – South, E – East, W – West

Given the available information, surface water has been identified to flow along the southern boundary of the site and would be considered to be sensitive to any potential contamination sources on site. Protection of surface water resources should therefore be taken into consideration during any proposed redevelopment works undertaken at this site.

4.9 Flood Risk

The table below provides a summary of the preliminary flood risk as given in the GroundSure report.

Table 4-5 Preliminary Flood Risk

Flood Risk Summary	
Risk of Flooding from Rivers	No risk given
Historical Flooding	The Environment Agency (EA) Historical Flood Map indicates no previously recorded flooding events at or directly adjacent to the site.
Flood defences	None.
Flood Zones	Not located in a flood zone.

Flood Risk Summary	
Surface Water Flooding	Highest risk on site: 1 in 30 years, between 0.3m to 1m depth relating to the stream present along the southern boundary. Highest risk within 50m: 1 in 30 years, 0.3m to 1.0m depth.
Groundwater Flooding Susceptibility	Highest risk on site: Low Highest risk within 50m: Moderate

Given the above information, flooding across the majority of the site is considered unlikely. There is an increased likelihood of flooding along the southern boundary associated with the existing stream; however, this preliminary assessment should be confirmed prior to construction.

5 Mining & Ground Related Constraints

The section below details any ground related constraints that could impact on future development of the site such as the historical mining legacy and subsidence risk detailed within the GroundSure Report. A copy of the GroundSure Report is included in Appendix C.

Only the information considered pertinent to the site has been included in this section.

5.1 Coal Mining

The Coal Authority interactive map (https://mapapps2.bgs.ac.uk/coalauthority/home.html) has been used in the below assessment.

The site is in a Coal Mining Reporting Area according to The Coal Authority. The site is not however indicated to be within a Development High Risk Area (DHRA).

A Coal Authority report was previously obtained for the adjacent parcel of land to the north. The information contained within this report has therefore been reviewed to provide a general idea as to the risk to the current site associated with historical coal mining and to assess the requirement for further assessment.

The Coal Authority report is summarised in the table below and is presented within Appendix D.

Table 5-1 Coal Authority Report Summary

Details	Comments
Coal Seams	No past mining recorded
Present / future coal mining	None identified.
Mine Entries	None located on site or the vicinity.
Coal mining subsidence	No records.
Coak Mining Geology	No faults present.
Open cast mines on or within 200m of the site	No records or future plans.
Mine gas	No records.
Remedial works	The property has not been subject to remedial works, by or on behalf of the Coal Authority
Withdrawal of Support	The property is not an area where notices to withdraw support were given.
Overall Risk	Based on the available information, it is considered that the site is at negligible risk from coal mining and gas egress risk.

5.2 Non-Coal Mining, Mineral Extraction, Ground Workings & Cavities

A review of the non-coal mining, quarrying and ground workings records potentially affecting the site has been undertaken. Records have been obtained from various sources such as the BGS, Coal Authority etc as detailed within the Groundsure Report.

This is generally based on features identified in the Groundsure report within 1km of the site boundary.

The review has however identified no pertinent records recorded within 1km of the site that could have an impact on development of the site, and will therefore not be considered further.

5.3 JPB Mining Area

The GroundSure report indicates that site is located within a JPB mining area. Whilst outside of an area where the Coal Authority have information on coal mining activities, Johnson Poole & Bloomer (JPB) may have information such as mining plans and maps held within their archive that have occurred within 1km of this property. The plans held by JPB may however also relate to non-mining records.

Taking the available information into consideration, as there are no historical records of mining activities recorded within the site boundary, at this stage JPB have not been contacted for information.

5.4 Natural Ground Subsidence Risk

Records of the natural ground subsidence risks identified for the site are summarised below.

Table 5-2 Natural Ground Subsidence Hazard Summary

Ground Stability Hazard	Hazard Rating	Comments
Shrink-Swell Clays	Very low to negligible	Ground conditions expected to be predominantly low to non-plastic plastic.
Running Sands	Very low to low	**Very Low** – relates to the Glaciofluvial Deposits mapped underlying the majority of the site (aside from the southern boundary). Running sand conditions are unlikely. No identified constraints on land use due to running conditions unless water table rises rapidly. **Low –** Relates to the alluvium mapped along the southern boundary - Running sand conditions may be present. Constraints may apply to land uses involving excavation or the addition or removal of water.
Compressible Deposits	Moderate to negligible.	**Moderate** - relates to the alluvium mapped along the southern boundary - Compressibility and uneven settlement hazards are probably present. Land use should consider specifically the compressibility and variability of the site. Elsewhere, compressible strata are not thought to occur.
Collapsible Deposits	Very low to negligible.	**Very low** - relates to the alluvium mapped along the southern boundary - Deposits with potential to collapse when loaded and saturated are unlikely to be present. Elsewhere, deposits with potential to collapse when loaded and saturated are believed not to be present.

Ground Stability Hazard	Hazard Rating	Comments
Landslides	Very Low	Slope instability problems are not likely to occur but consideration to potential problems of adjacent areas impacting on the site should always be considered.
Ground Dissolution of Soluble Rocks	Negligible	Soluble rocks are either not thought to be present within the ground, or not prone to dissolution. Dissolution features are unlikely to be present.

The most significant ground stability hazard is related to the potential for compressible deposits to be present along the southern boundary associated with the alluvium mapped which might also be susceptible to running sand conditions. The compressibility of the in-situ soils and potential for running sands should therefore be determined by undertaking an intrusive site investigation across the site to confirm the site-specific ground conditions.

5.5 Potential for Unexploded Ordnance (UXO)

Regional Unexploded Bomb Risk maps from Zetica indicates that the site has a low risk in regard to UXO. Zetica state that low-risk regions are those with a bombing density of up to 15 bombs per 1000 acres or less. In general, a low risk means that there is no greater probability of encountering UXO than anywhere else in the UK.

In that regard, the risk of encountering UXO on site is considered to be low and therefore no further assessment is therefore considered to be warranted.

The Zetica unexploded bomb risk map is presented in Appendix E.

5.6 Potential for Radon

The Groundsure Report indicates that the property is in a lower probability radon area (less than 1% of homes are estimated to be at or above the Action Level). This indicates that no radon protective measures would be required in this area.

The dataset used within the Groundsure Report to derive the above is considered the highest resolution radon dataset available for the UK. The findings of this should supersede any estimations derived from the Indicative Atlas of Radon in Great Britain.

5.7 Railway Infrastructure & Projects

No pertinent records of railways, tunnels and infrastructure have been recorded within 500m of the site boundary which could have an impact on future development of the site.

6 Environmental Review

6.1 Information Sources

Environmental data, including Environment Agency and Local Authority regulatory information, has been obtained via the Groundsure Report contained within Appendix C.

The Groundsure Report contains factual information, which has been obtained from various sources, including Ordnance Survey Mapping, Local Authorities, Environment Agency, National Radiological Protection Board, the National Archives and English Nature. The environmental records pertinent to the site have been reviewed in the sections below.

6.2 Environmental Records

The environmental records have been reviewed to identify any pertinent land use features or regulatory records that may have the potential to impact the site. This review is generally based on features identified in the Groundsure report within ~500m of the site boundary. Additional records at a distance >500m from the site boundary are however presented in the Groundsure Report and will be also considered below if relevant to the site;

6.2.1 Landfills and waste Disposal Sites

A summary of landfills / waste disposal sites that could potentially impact the site are given below.

Table 6-1 Landfills & Waste Disposal Sites

Landfills & Waste Disposal Sites	Distance (m)				Summary	Comments
	On Site	0 - <50m	50 - <250m	250 - 500m		
Historical Landfill (EA NRW Records)	-	-	-	2	Newbold Verdon Landfill Site located ~410m N; Waste listed as unknown. Wrask Farm, located 480m NE; waste listed as inert, industrial last recorded in 1950.	Low risk to site given the distance and / or age of fill.

KEY: N – North, S – South, E – East, W – West

6.2.2 Current Industrial Land Use

A summary of current industrial land uses sites that could potentially impact the site are given below.

Table 6-2 Current Industrial Land Use

Current Industrial Land Use	Distance (m)				Summary	Comments
	On Site	0 - <50m	50 - <250m	250 - 500m		
Current Potentially Contaminative Land Uses	-	-	2	-	Relates to 2 No. records for electricity sub stations (ESS) located 65m NW and 90m NW of the site.	No risk to site given the distance.
Current or Recent Petrol Stations	-	-	-	1	Located ~430m E of the site listed as obsolete.	No risk to site.
Sites determined as Contaminated Land under Part 2A	-	-	-	-	No records.	-

KEY: N – North, S – South, E – East, W – West

6.2.3 Environmental Regulatory Records

A summary of the Environmental Regulatory Records that could potentially impact the site are given below.

Table 6-3 Environmental Regulatory Records

Environmental Regulatory Records	Distance (m)				Summary	Comments
	On Site	0 - <50m	50 - <250m	250 - 500m		
Licensed pollutant release (Part A(2)/B)	-	-	-	1	This record relates to an historical permit for unloading of petrol into a petrol service station located ~450m NE. (Part B Permit).	No risk to site

Environmental Regulatory Records	Distance (m)				Summary	Comments
	On Site	0 - <50m	50 - <250m	250 - 500m		
Licensed Discharges to controlled waters	-	2	-	10	The closest record relates to sewage discharges (sewer storm overflow) located ~15W into a tributary of Thurlaston Brook effective from 2020. Remaining entries relate to the same discharge located ~420m W also for storm overflow.	The discharge consents will contain conditions and limits to the discharge and as such, are considered unlikely to impact the site from unauthorised discharge.
Pollution Incidents (EA/NRW)	1	-	1	1	An on-site minor pollution incident occurred in 2001 involving gas and fuel oils impacting water. The remaining incident occurred ~180m SE and ~310m W both minor land impacts.	The closest incident occurred in the west corner of the site (potentially off-site) impacting the existing surface water stream. Surface water is indicated to flow towards the west away from the site carrying any contamination downstream. As such, due to the age, severity and location of the pollution incident, this pollution incident is considered unlikely to have the potential to impact the site.

KEY: N – North, S – South, E – East, W – West

6.2.4 Environmental Designations

There are no environmental designations of concern that could impact / affect redevelopment of the site located on-site or within 500m of the site boundary.

6.3 Environmental Records Summary

In summary, there are 2 No. historical landfill records located within 500m of the site boundary. However, given the distance and / or age of fill, these landfills are considered unlikely to impact the site via migration of landfill gas.

There is a licensed discharge to controlled waters record relating to sewage discharges (sewer storm overflow) located ~15 west of the site discharging into a tributary of Thurlaston Brook which was effective from 2020.

However, discharge consents consent will contain conditions and limits to the discharge and as such, are considered unlikely to impact the site from unauthorised discharge.

An on-site minor pollution incident occurred in 2001 involving gas and fuel oils impacting water which occurred in the west corner of the site (potentially off-site) impacting the existing surface water stream. However, surface water is indicated to flow towards the west away from the site which would carrying any residual contamination downstream. As such, due to the age, severity and location of this pollution incident, it is considered unlikely to have the potential to impact the site.

6.4 Visual and Cultural Designations

Visual and cultural designations are only assessed in this desk study in relation to their potential to be environmental receptors for contamination at the site or which could be impacted by the development.

However, within 250m of the site, there are no visual and cultural designation records and will therefore not be considered further.

7 Preliminary Contamination Risk Assessment

7.1 Introduction

This section provides a qualitative Preliminary Risk Assessment (PRA) of the risk posed from potential on and off-site contamination sources, identified by the information presented in the previous sections of this report and outlines the assessment process and procedures employed and the assessment findings.

A PRA is the first tier of risk assessment that develops the Initial Conceptual Site Model (ICSM) to establish whether there are any potentially unacceptable risks associated with the site.

The legislative framework for Land Contamination Risk Management (LCRM) guidance published by the EA on 8th October 2020 (updated July 23) and has been adhered to throughout this PRA. Details of the framework is provided on the following government website:

https://www.gov.uk/government/publications/land-contamination-risk-management-lcrm

The Environment Agency (EA) expects this guidance to be followed and referenced when managing the risks from land contamination.

7.2 Initial Conceptual Site Model

The first stage in the assessment of a site is the derivation of an ICSM. The information previously gathered during the review will be used to develop the ICSM which is representative of the characteristics of the site. This will be in a written or tabulated form, considering all potential sources of contamination, all potential receptors and whether there is a plausible pathway between the two.

The ICSM has been developed based on the commonly adopted Source-Pathway-Receptor (S-P-R) model as detailed within the LCRM guidance. In the context of LCRM, there are three essential risk elements. All three risk elements can exist independently, but without the three risk elements being linked there is no risk. Where all three elements are present or are likely to be present, they are described as potential contaminant linkages, which can then be subjected to the risk assessment and risk management process.

The three risk elements are detailed in the table below.

Table 7-1 Summary of Risk Elements

Risk Element	Definition
Source (S)	A contaminant or pollutant that is in, on or under the land and that has the potential to cause harm or pollution.
Pathway (P)	A route by which a receptor is or could be affected by a contamination.
Receptor (R)	Something that could be adversely affected by a contaminant, for example a person, controlled waters, an organism, an ecosystem, or Part 2A receptors such as buildings, crops or animals

If a contaminant linkage exists on site there is a risk, and if realised may result in:

- A potential liability under current environmental legislation including Part 2A of the Environmental Protection Act 1990 (if 'significant harm' or the 'possibility of significant harm' is occurring) or Groundwater Regulations 1998.

- Redevelopment of the site could lead to risks to new property, site personnel and, if no intervention, future occupiers from existing contamination. These risks would have to be mitigated under the planning regime.

- Liabilities associated with pollution of adjacent land & damage to adjacent property.

By considering the S-P-R (contaminant linkages), an assessment of the human health / environmental risks is made regarding the significance and degree of the risk. This assessment is based on consideration of whether the source of contamination can reach a receptor and hence whether it is of major or minor significance.

The risk assessment procedures to derive contaminant linkages and to develop an ICSM are described in Appendix F.

7.3 Contaminant Linkage Assessment

The qualitative contaminant linkage assessment has identified several potential contaminant linkages as discussed in further detail below.

7.4 Potential Sources of Contamination

Sources (S); These are potential or known sources of contamination that may relate to a former land use or present site feature or process (e.g., fuel storage tanks).

The potential on-site and off-site sources of contamination that have been identified during the desk study and reconnaissance are detailed in the table below.

Table 7-2 Potential Sources of Contamination

Location	Potential Sources (S)	Inorganic Contaminants	Organic Contaminants
On-Site	Possible areas of unrecorded Made Ground (former in-filled pond, track, concrete plinth, shed and elsewhere).	Common contaminants may include: Cadmium, chromium, copper, lead, mercury, nickel, zinc, sulphate, sulphide, sulphur, pH, free cyanide, asbestos.	Depends on source of material; common contaminants may include: Poly-Aromatic Hydrocarbons (PAH), Petroleum Hydrocarbons (TPH) and Volatile Organic Compounds (VOCs).
On-Site	Agricultural Land - Potential for localised spills of fuels / oils from farm machinery and chemical use.	Naturally occurring metals and asbestos.	As above and pesticides.
On-Site	Burning of garden waste.	Potential for PAH contamination.	Poly-Aromatic Hydrocarbons (PAH).
On-Site	Mudstone Bedrock of the MMG.	Elevated sulphates	-

Aside from the above, a licensed discharge to controlled waters (sewage discharges for sewer storm overflow) has been identified located ~15 west of the site. However, discharge consents consent will contain conditions and limits to the discharge and as such, are considered unlikely to impact the site from unathorised discharge.

A minor pollution incident has also been identified involving gas and fuel oils impacting the surface water stream located in the west corner of the site. However, surface water is indicated to flow towards the west away from the site which would carry any residual contamination downstream. As such, due to the age, severity and location of this pollution incident, it is considered unlikely to have the potential to impact the site. Should any obvious signs of contamination be identified in the soils in the vicinity of the stream to the south / south west of the site then targeted testing should be carried out for any potential contaminants of concern.

7.5 Potential Sources of Hazardous Ground Gas and Vapours

The potential sources of hazardous ground gas / vapours identified on site and in the surrounding, alongside the gas generation and migration potential are detailed in the table below.

Table 7-3 Potential Sources of Hazardous Ground Gas / Vapours

Location	Potential Sources (S)	Details	Gas Generation & Migration Potential (CIRIA C665)
On-site	Ground Gas: Areas of unrecorded Made Ground (in-filled pond and potentially elsewhere).	Made Ground has the potential to generate elevated ground gas at the site, particularly if any putrescible material is present.	Generally, very low and localised to the source but would be dependent on nature of any materials identified.
On-site	Ground Gas: Areas of site underlain by alluvial deposits in the south.	Alluvial deposits have the potential to generate ground gas, particularly if soils are of high organic content.	Generally, very low and localised to the source but would be dependent on nature of any materials identified.
Off-Site	Ground Gas. Two historical landfill records located within 500m of the site boundary.	Landfill material has the potential to generate elevated ground gas particularly if any putrescible material is present.	Low to moderate generation potential: however, given the distance and / or age of fill, these landfills are considered unlikely to impact the site via migration of landfill gas.
On-site & Off-site	Organic Vapours: Spills / leaks of fuels / oils from the various sources identified in Table 7-2.	The potential exists for localised VOCs to be present within any soils / groundwater below the site associated with leaks or spills from farm vehicles historically using the site and vehicles using adjacent roads migrating towards the site.	Generally low and localised to the source.

The organic content of any underlying ground, the available degradable material proportion, the nature of any fill materials (if present) and the general ground conditions across the site the site should be established by undertaking an intrusive investigation on site. This should assist with establishing if a hazardous ground gas and vapour risk is present.

7.6 Identified Potential Pathways (P)

Migration pathways are defined as the routes that chemicals take from a source to an exposed organism or receptor. Potential human exposure to contaminants is feasible through three principal pathways (ingestion, inhalation and dermal contact) as defined in the LCRM guidance which are summarised below. Other potential pathways potentially affecting the wider environment such as controlled waters, buried structures and ecological receptors have also been included and are summarised in the table below. This is based on a proposed residential end-use of the site.

All plausible pathways (P) between the potential contaminant sources (S) and the receptors (R), i.e., S-P-R contaminant linkages, that have been identified and are outlined below in Table 7-4.

Table 7-4 Potential Pathways

Pathway	Details
Ingestion of Soils / Dust / Groundwater	Eating and swallowing of contaminated soil and/or groundwater either by deliberate consumption, indirectly by eating or smoking with dirty hands or by ingestion of fugitive dust.
Dermal Contact with Soils / Dust / Groundwater	Direct contact with contaminated soil and groundwater, causing skin conditions such as dermatitis etc. Certain contaminants can be absorbed into the body through the skin or enter directly through open cuts or abrasions.
Inhalation (Outdoor / Indoor) of Dust and / or Vapour	Breathing dust and vapour from contaminated soil in outdoor air. Vapour can also migrate into buildings resulting in inhalation by the occupants, as can dusts which may be tracked back to the school buildings.
Leaching	Infiltration of water through soil can leach out soluble contaminants migrating laterally and/or vertically dependent on permeability, preferential pathways, man-made voids etc., resulting in groundwater pollution.
Migration of Contaminated Water	Contaminated groundwater can migrate laterally and/or vertically dependent on permeability, preferential pathways, within the aquifer and via man-made voids etc. Surface water run-off of contaminated water can also occur.
Aggressive Attack	Building materials can be damaged by direct contact with aggressive ground conditions, for example sulphate attack on concrete and hydrocarbon attack on plastics, causing embrittlement.
Direct Contact & Uptake by Plants	Plants on-site / surrounding area are susceptible to site-based contamination.
Migration and accumulation of Ground Gas / Vapour	Generated ground gas / vapour can migrate laterally and / or vertically dependent on permeability, preferential pathways, man-made voids etc.

7.7 Identified Potential Receptors

Receptors are defined as human (site occupiers, end users etc) or non-human (controlled waters, property and ecological) receptors that have the potential to experience adverse effects from direct or indirect exposure to contaminated material.

The receptors that are currently present on and off the site or likely to be present in the future as detailed in the table below and are based on the proposed residential end-use.

Table 7-5 Potential Receptors

Receptor Category		Present	Type of Receptor / Comment
Human Health	Future Site Occupants (End Users)	Y	A female child will be regarded as the critical receptor.
	Construction Workers	Y	A female adult office worker will be regarded as the critical receptor.
	Adjacent Site Users	Y	A female child will be regarded as the critical receptor
Controlled Waters	Groundwater	Y	Superficial deposits - Secondary A Aquifer. Bedrock - Secondary B Aquifer.
	Surface Water	Y	Surface water stream located adjacent south.
Property	Underground Structures	Y	Buried Services (Present & Future).
		Y	Buried concrete (Present & Future).
Ecological	Flora and fauna	Y	Woodland / hedgerows located on-site / adjacent.

7.8 Potential Contaminant Linkages

The risk classification has been qualitatively derived in accordance with the legislative framework for LCRM and in accordance with CIRIA C552 (2001). The methodology is presented in Appendix F.

The PRA has identified the potential for localised contamination at the site resulting from past / present on-site and off-site land uses which may have potentially impacted the site. Plausible contaminant linkages have been identified and therefore a site investigation is recommended to establish current levels of contamination and risk.

Based on the information above, the ICSM and potential contaminant linkages considered applicable to the site are detailed in Table 7-6 overleaf. The ICSM is based on current site conditions and information reviewed to date and will need to be revised should any changes at the site take place or when additional data is available.

The ICSM has been designed in general accordance with BS EN ISO 21365:2020 – 'Soil Quality Conceptual Site Models for Potentially Contaminated Sites'.

Table 7-6 ICSM & Potential Contaminant Linkages

Contaminant Linkage			Risk Assessment		
Source (S)	**Pathway (P)**	**Receptor (R)**	**Probability**	**Consequence**	**Current Risk**
Human Health					
Potential contaminants as detailed in Table 7-2.	Ingestion of contaminated particulates. Dermal contact. Inhalation of contaminated dust / particles.	Site end users.	Unlikely	Medium	Low
		Construction workers / maintenance workers.	Unlikely	Medium	Low
Potential contaminants as detailed in Table 7-2.	Inhalation of contaminated dust / particles.	Members of the public / properties adjacent to the site during construction	Low	Mild	Low
Potential sources of hazardous ground gas as detailed in Table 7-3.	Migration of asphyxiant and explosive/ harmful gasses into confined spaces.	Site end users.	Unlikely	Severe	Low / moderate
		Construction workers / maintenance workers.	Unlikely	Severe	Low / moderate
Potential sources of vapours as detailed in Table 7-3.	Inhalation of vapours in indoor and outdoor air.	Site end users.	Unlikely	Severe	Low / moderate
		Construction workers / maintenance workers in trenches.	Unlikely	Severe	Low / moderate

Contaminant Linkage			Risk Assessment		
Source (S)	**Pathway (P)**	**Receptor (R)**	**Probability**	**Consequence**	**Current Risk**
Controlled Waters					
Potential contaminants as detailed in Table 7-2.	Leaching of contamination into groundwater.	Secondary Undifferentiated (Superficial) Aquifer and Secondary B (Bedrock) Aquifer.	Unlikely	Medium	Low
	Surface water run-off and / or migration of contaminated groundwater.	Inland rivers located adjacent south – surface water stream.	Unlikely	Medium	Low
Property and Infrastructure					
Potential contaminants as detailed in Table 7-2.	Leaching of contaminants & direct contact	Buried concrete & structures	Low	Medium	Moderate / Low
Potential contaminants as detailed in Table 7-2.	Leaching of contaminants & direct contact	Buried services / water pipes.	Unlikely	Mild	Very Low
Ecology					
Potential contaminants as detailed in Table 7-2.	Uptake of available phytotoxic contaminants via direct contact with contaminants.	Ecological receptors Flora & Fauna on and off-site. Adjacent Woodland.	Low	Mild	Low

8 Conclusions and Recommendations

8.1 Conclusions

The Desk Study has produced the following key conclusions and recommendations.

8.1.1 Site Summary

Site Summary	
Proposed Development	Potential future development proposals for the site are understood to comprise a residential development.
Current Site Use	The site predominantly comprises agricultural fields devoid of any structures.
Surrounding Land Use	Surrounding land uses comprise agricultural to the south, residential to the north and west and recreational to the north-east.
Brief Site History	The site has remained undeveloped prior to 1885 with no discernible change up to the present day. A pond was however historically located in the south-west corner of the site which was indicated to have been in-filled in the late-1950s which could present a localised source of unidentified contamination / ground gas arising from any in-fill materials. A track is present along the eastern boundary which could represent a source of Made Ground. An historical tank record (dated 1991) has also been identified for the land adjacent north potentially related to a fuel tank present at the adjacent residential development.

8.1.2 Environmental Risk Assessment Summary

Environmental Summary	
Human Health Risk Assessment	The assessment has identified limited potential on and off-site sources of localised contamination associated with the historical / current land uses identified which may represent localised sources of heavy metals, hydrocarbon fractions, PAHs, asbestos fibres & ACMs to have impacted the site. Where localised on-site and off-site potential sources of contamination have been identified, the preliminary risk assessment has indicated that, in the absence of any mitigation measures, the site poses a **LOW / MODERATE** risk to human health in these areas until proven otherwise. The majority of the site is however currently in use as agricultural farmland. As such, there is considered to be a **LOW** risk to Human Health end users / construction workers based on redevelopment of the site for a residential end use.
Controlled Waters Risk Assessment	The preliminary risk assessment has indicated that the site poses a **LOW** risk to a Controlled Waters. There is a stream located on the southern boundary that is considered sensitive to site contamination; however, given the lack of significant contamination sources present, the risk to the stream is considered low.
Hazardous Ground Gas Risk	**LOW / MODERATE** risk associated with hazardous ground gas. Gas and groundwater monitoring on 6 No. occasions over a 3-month period is recommended (CIRIA C665).

Environmental Summary	
Vapour Risk	The risk of encountering vapour's on-site is generally **LOW**. However, the potential exists for a localised **LOW / MODERATE** risk of vapours to impact the site / site boundaries / groundwater under the north of the site arising from leaks and spills of fuels associated with a former off-site tank located adjacent north that could have contained fuel.
Radon	The site is not in a radon area; radon protection measures therefore not required.
Ecological Risk	**LOW** risk from potential Impacts from identified contamination sources and proposed construction to ecological receptors.

8.1.3 Geotechnical Summary and Constraints

Geotechnical Summary and Constraints	
Expected Ground Conditions	The underlying geology is expected to comprise superficial sand and gravel deposits across much of the site with variable alluvial deposits present across the southern boundary. Mudstone bedrock is expected to underlie the superficial deposits across the entire site.
Mining Risk	Based on the available information, the site is not at risk from coal mining / non-coal mining activities.
Ground Related Constraints	Moderate compressibility risk associated with Alluvium mapped on the southern boundary which might also be susceptible to running sand conditions.
Preliminary Foundation Assessment	Strip or trenchfill foundations may be appropriate for the majority of the site, subject to an assessment of loadings of the proposed structures and verification of the ground conditions by intrusive investigation. Localised deepening of foundations/alternative foundations may also be required, coinciding with any potential soft compressible alluvial deposits, loose sand and gravels and if affected by the influence of trees. The underlying mudstone bedrock (MMG) deposits are noted for potentially containing pyrite and elevated sulphates. It is therefore recommended that appropriate classification testing of the bedrock material should be undertaken as part of the site investigation.
Preliminary Drainage Assessment	Areas of the site underlain by superficial sand and gravels could potentially be suitable for drainage; however, if mudstone bedrock is encountered at shallow depth, then drainage may be limited. This preliminary assessment should be confirmed by undertaking infiltration testing on site in accordance with BRE365 guidance.

8.2 Recommendations

An intrusive site investigation should be undertaken to confirm ground conditions underlying proposed development, to confirm suitable foundation solutions and to confirm the contaminative status of the site. Investigation works should specifically target any identified potential sources of contamination / compressible strata.

9 References

The following documents are referenced in the report;

1. Land Contamination Risk Management (LCRM) 2020
https://www.gov.uk/government/publications/land-contamination-risk-management-lcrm

2. CIRIA C552, Contaminated land risk assessment - A guide to good practice, dated 2001.

3. British Standards Institution (BSI) BS10175:2011+A2:2017 Investigation of Potentially Contaminative Sites Code of Practice 2015.

4. BS 5930 'Code of Practice for Site Investigations' 2015+A1:2020.

5. Construction Industry Research and Information Association (CIRIA). 2008. Assessing the risk posed by hazardous gases to buildings. C665.

6. BS EN ISO 21365:2020 – Soil Quality. Conceptual Site Models for Potentially Contaminated Sites.

Drawings

PJS24-0012-DR-0001	Site Location Plan
PJS24-0012-DR-0002	Site Features Plan

A4

General Notes

1. Do not scale this drawing. If in doubt, ask.
2. This drawing is to be read in conjunction with all other relevant Engineers, Architects and specialist design drawings and details.
3. All dimensions are in metres unless noted otherwise. All levels are in metres unless noted otherwise.
4. Any discrepancies noted on site are to be reported to the Engineer immediately.

Rev	Date	Amendments	By	Chk

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Client: Richborough

Project: Newbold Verdon Phase 2

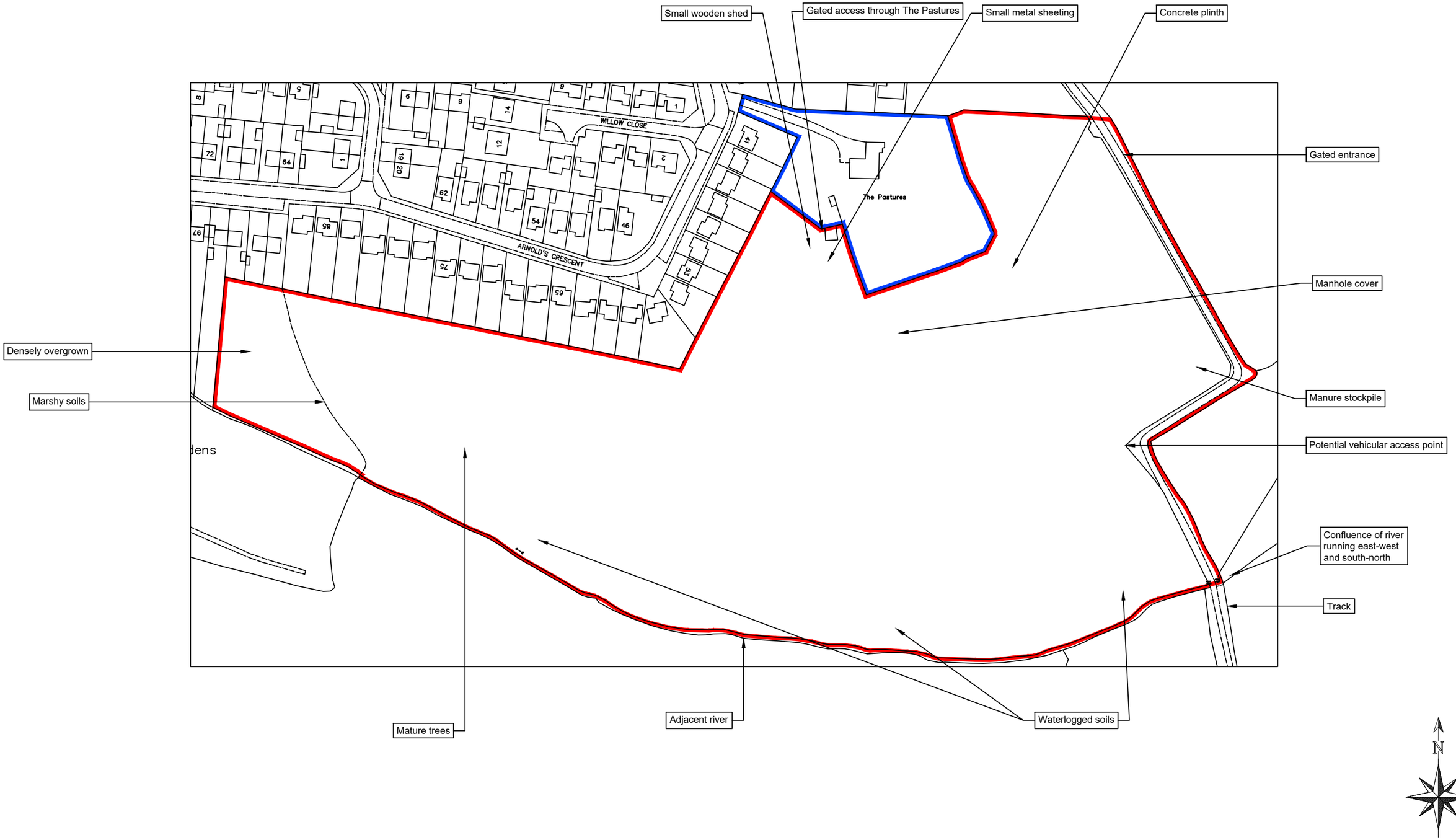
Drawing Title: Site Location Plan

	Drawn	Checked
Initial	DH	VH
Date	16/02/24	16/02/24

Status	Scale
INFORMATION	NTS

Project	Drawing Number	Revision
PJS24-0012	DR-0001	-

A3



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Client	Richborough
Project	Newbold Verdon Phase 2
Drawing Title	Site Features Plan
Drawn / Checked	Initial: DH / VH; Date: 16/02/24 / 16/02/24
Status	INFORMATION
Scale	NTS
Project	PJS24-0012
Drawing Number	DR-0002
Revision	-

Rev	Date	Amendments	By	Chk

General Notes

1. Do not scale this drawing. If in doubt, ask.
2. This drawing is to be read in conjunction with all other relevant Engineers, Architects and specialist design drawings and details.
3. All dimensions are in metres unless noted otherwise. All levels are in metres unless noted otherwise.
4. Any discrepancies noted on site are to be reported to the Engineer immediately.

Appendix A: Site Walkover Photos

PJS Consulting Engineers Ltd
Geneva II Lakeview
Annesley
Nottinghamshire NG15 0ED
UK

Project: PJS24-12 Newbold Verdon Phase 2
Report date: 19 Feb 2024 1:12:05 pm
Generated by: Paul Smith
Email: enquiries@pjs-geo.co.uk

PJS24-12 Newbold Verdon Phase 2 19-February-2024 1:12:02 PM

REPORT DETAILS
Capture date: 15 Feb 2024
Captured by: Paul Smith

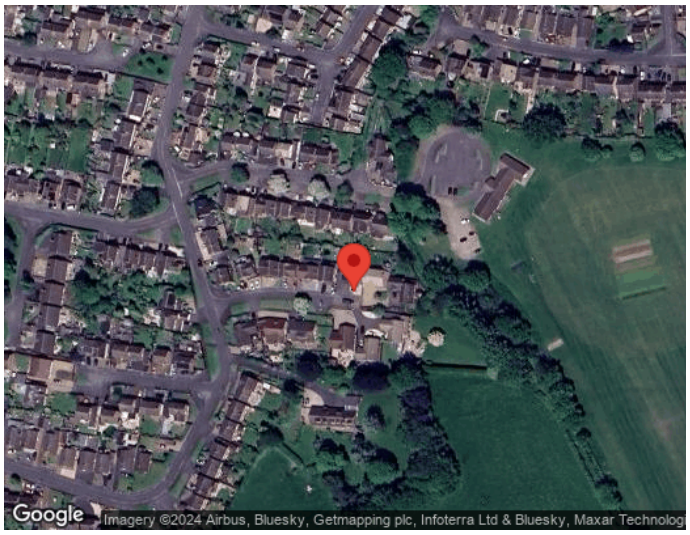
CONTENTS
Report items: 92
Photos: 46

View online

Item 1

ID: A001 (15 Feb 2024)

Entrance via public footpath off Barbara Ave



Item 2

ID: A002 (15 Feb 2024)

Locked gate to site on eastern boundary

Item 3 **ID:** A003 (15 Feb 2024)

View south from northern portion

Item 4 **ID:** A004 (15 Feb 2024)

Boundary with neighbouring property

Item 5 **ID:** A005 (15 Feb 2024)

Unidentified structure eastern portion

Item 6 **ID:** A006 (15 Feb 2024)

Northern boundary

Item 7 **ID:** A007 (15 Feb 2024)

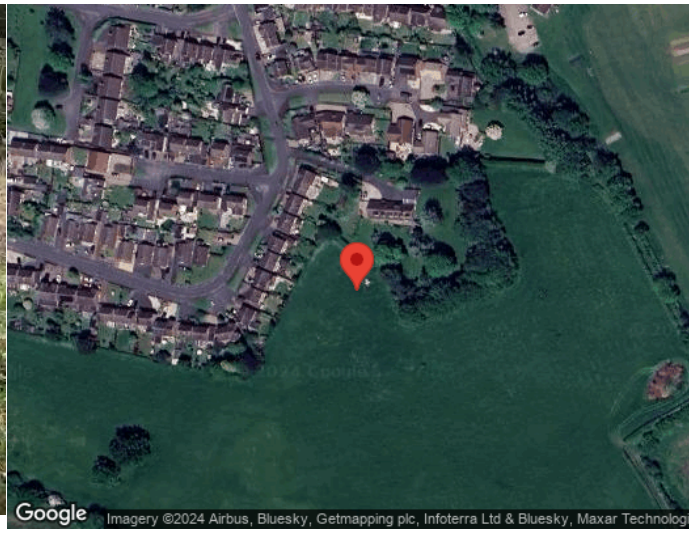
Drain cover north central

Item 8 **ID:** A008 (15 Feb 2024)

Northern access point and small shed

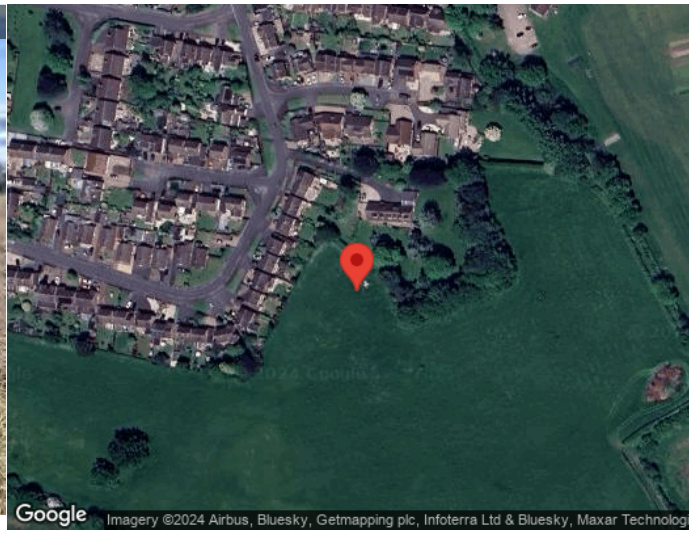
Item 9 **ID:** A009 (15 Feb 2024)

Vegetation burning



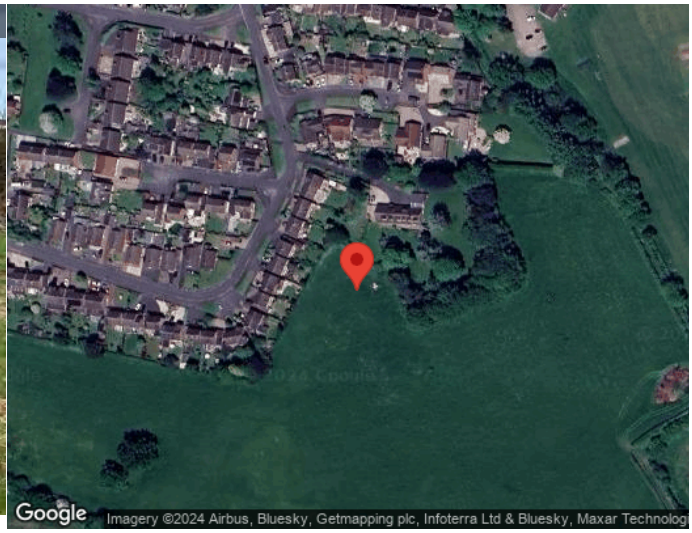
Item 10 **ID:** A010 (15 Feb 2024)

Waste metal



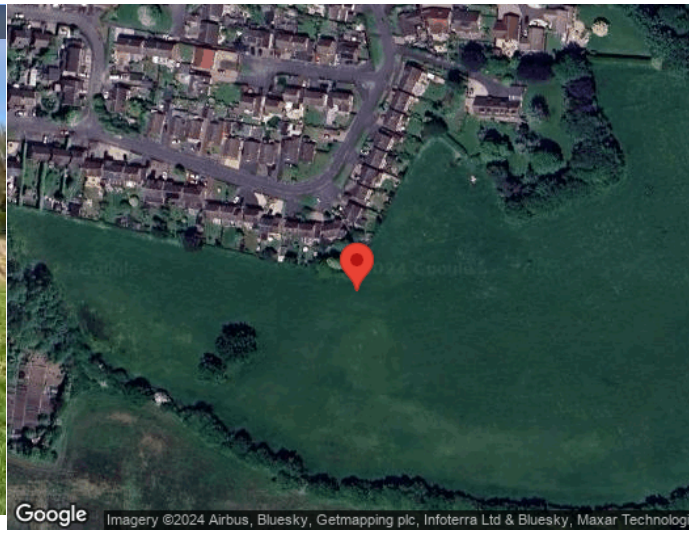
Item 11 **ID:** A011 (15 Feb 2024)

Hut/shed



Item 12 **ID:** A012 (15 Feb 2024)

Northern central portion



Item 13 **ID:** A013 (15 Feb 2024)

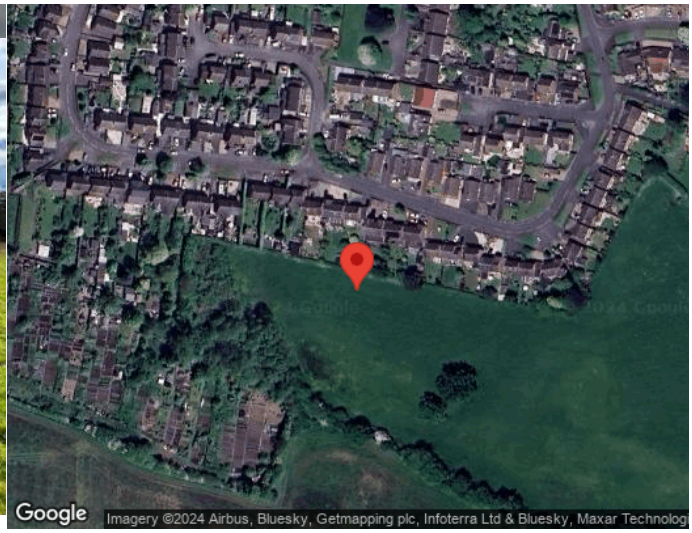
View east across site

Item 14 **ID:** A014 (15 Feb 2024)

View west across site

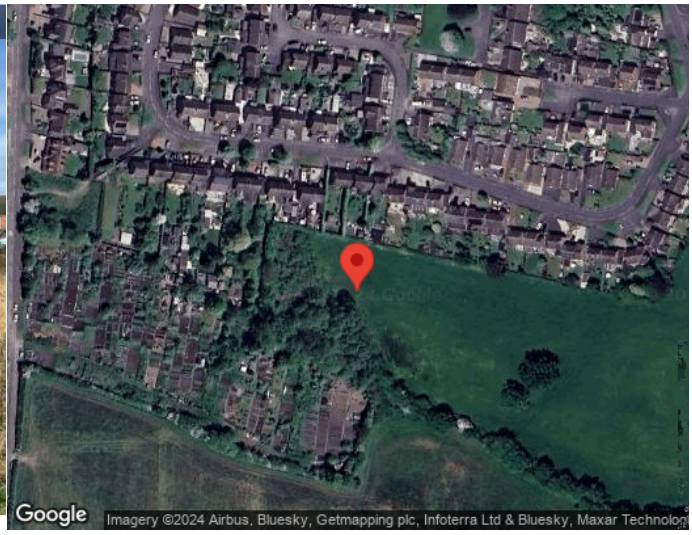
Item 15 **ID:** A015 (15 Feb 2024)

View southeast



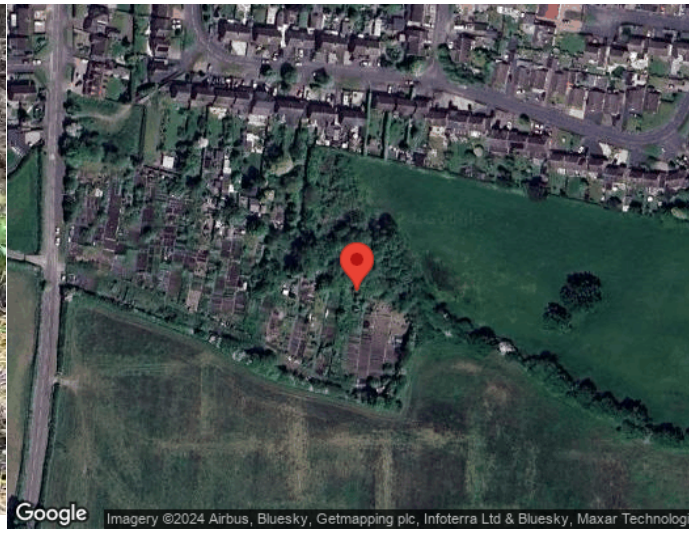
Item 16 **ID:** A016 (15 Feb 2024)

Overgrown on western boundary



Item 17 **ID:** A017 (15 Feb 2024)

Small drainage ditch



Item 18 **ID:** A018 (15 Feb 2024)

Standing surface water, boggy soils in western portion

Item 19 **ID:** A019 (15 Feb 2024)

Further swampy ground and reeds in west

Item 20 **ID:** A020 (15 Feb 2024)

River along southern boundary

Item 21 **ID:** A021 (15 Feb 2024)

View north-east

Item 22 **ID:** A022 (15 Feb 2024)

Northern boundary

Item 23 **ID:** A023 (15 Feb 2024)

Item 24 **ID:** A024 (15 Feb 2024)

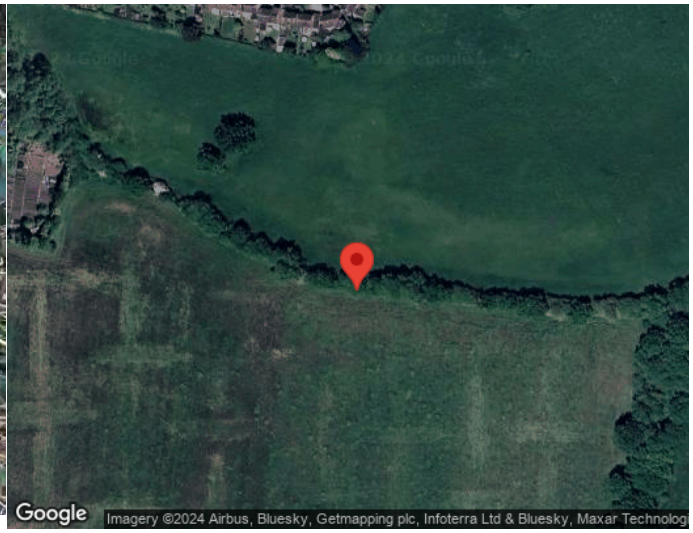
River along southern boundary

Item 25 **ID:** A025 (15 Feb 2024)

Waterlogged soil

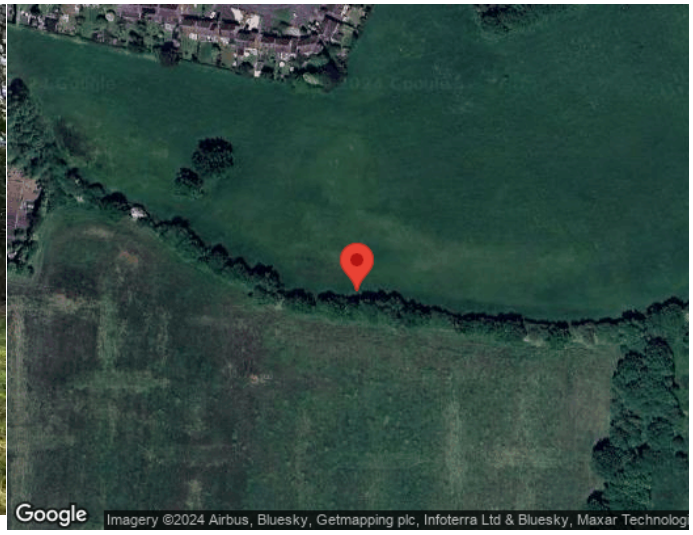
Item 26 **ID:** A026 (15 Feb 2024)

River on southern boundary



Item 27 **ID:** A027 (15 Feb 2024)

View east along southern boundary

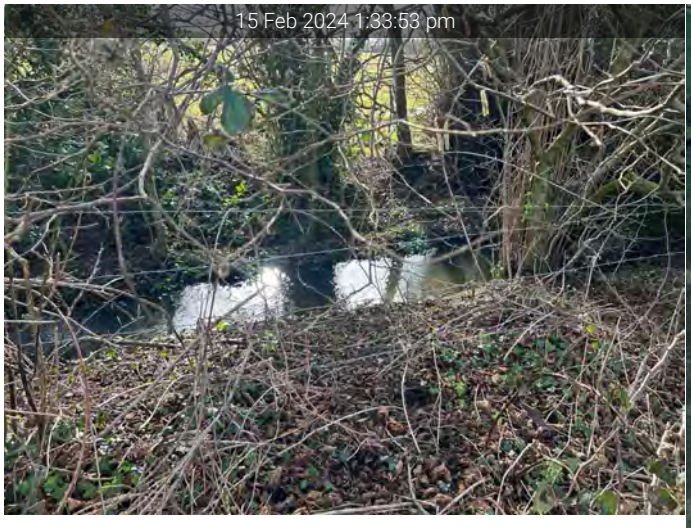


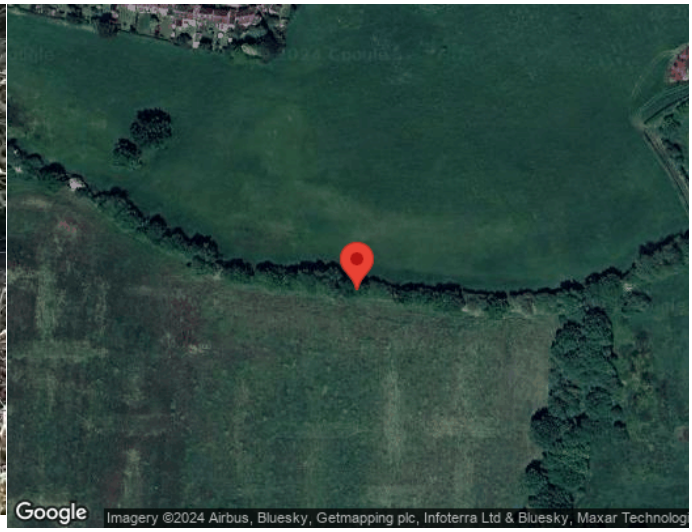
Item 28 **ID:** A028 (15 Feb 2024)

View west along southern boundary

Item 29 **ID:** A029 (15 Feb 2024)

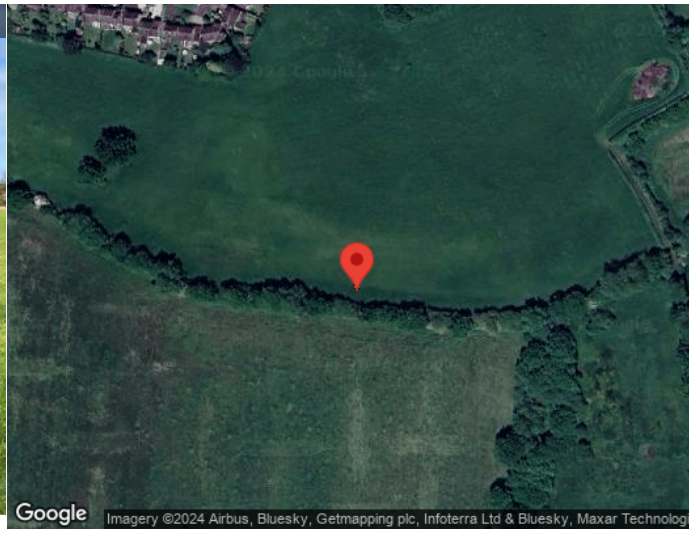
River on southern boundary





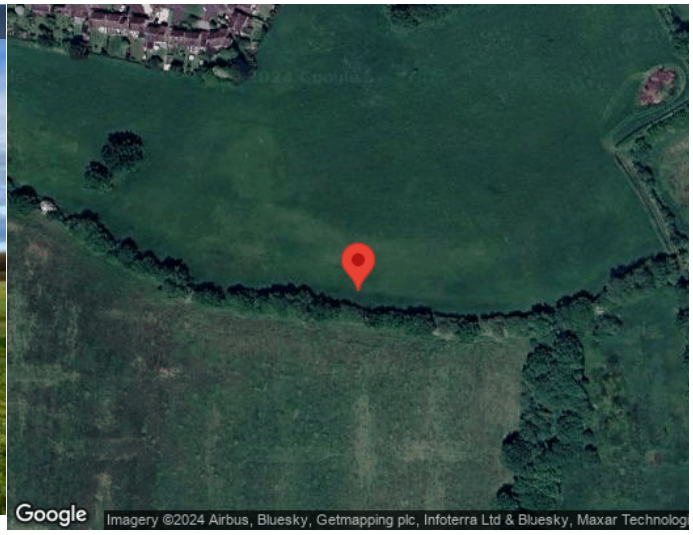
Item 30 **ID:** A030 (15 Feb 2024)

View northwest



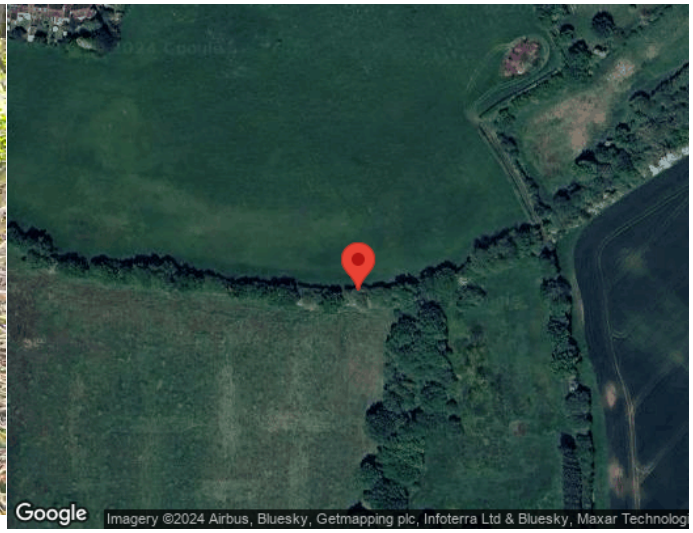
Item 31 **ID:** A031 (15 Feb 2024)

View northeast



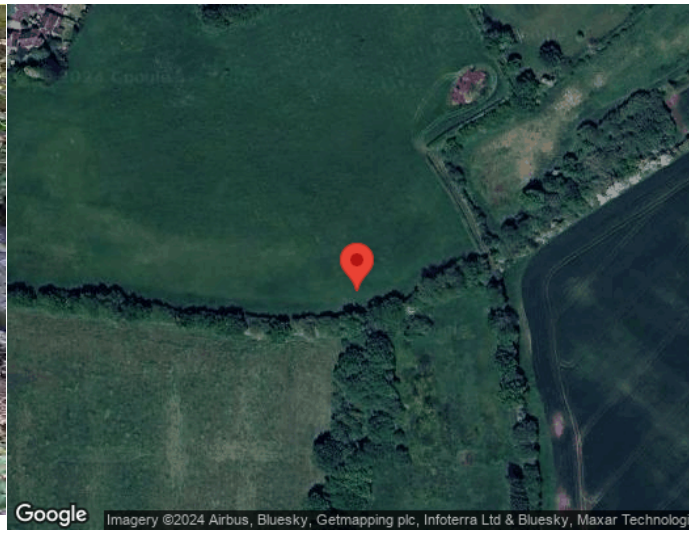
Item 32 **ID:** A032 (15 Feb 2024)

River on southern boundary



Item 33 **ID:** A033 (15 Feb 2024)

River on southern boundary

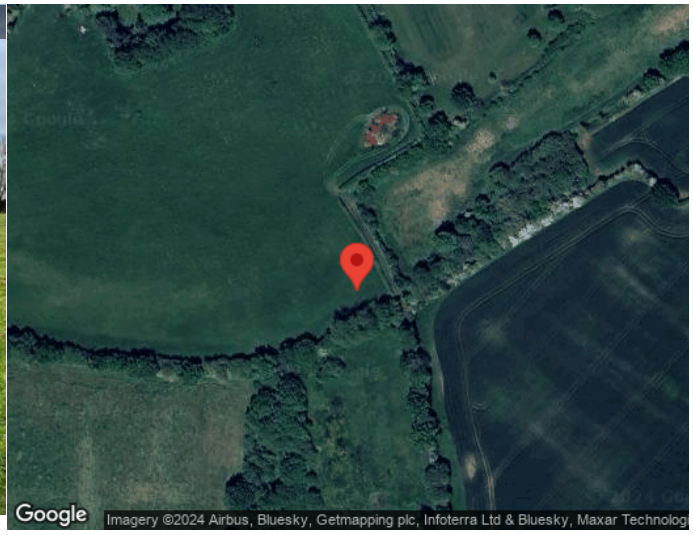


Item 34 **ID:** A034 (15 Feb 2024)

Waterlogged soils

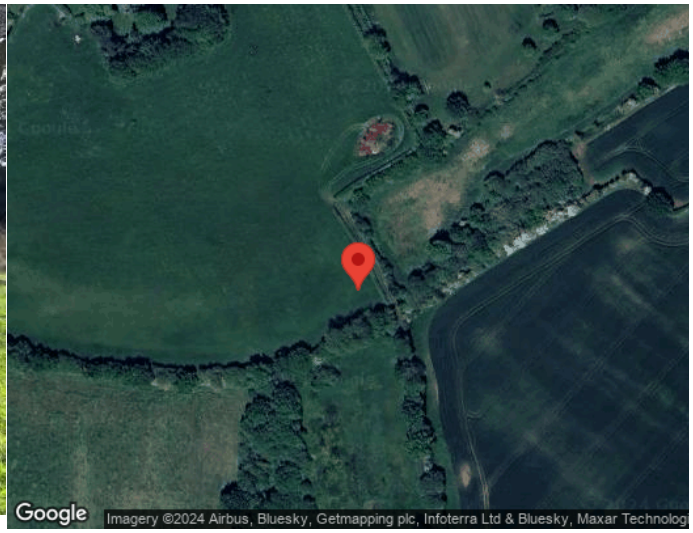
Item 35 **ID:** A035 (15 Feb 2024)

North-west from south eastern corner



Item 36 **ID:** A036 (15 Feb 2024)

South eastern corner



Item 37 **ID:** A037 (15 Feb 2024)

Anticipated vehicle access point