



Heywood Old Road Preliminary Risk Assessment

Job Number
LKC251564

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Client
Rochdale Borough Council

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1. Introduction

LK Consult Ltd (LKC) has been commissioned to carry out a Phase 1 Preliminary Risk Assessment (PRA) for Land off Heywood Old Road, Middleton.

In accordance with current guidance (including LCRM¹ and the National Planning Policy Framework (NPPF)²), the PRA will include a site reconnaissance, site history, geology, hydrogeology, hydrology, mineral search, and a landfill search. Information gathered from the desk study and site reconnaissance will be used to develop a contamination conceptual model for the site.

In addition, the information gathered will be used to identify potential geotechnical constraints associated with the redevelopment of the site.

Based on the findings of this report, an appropriate site investigation can be derived, if required.

A summary of the site details is presented in Table 1-1. Figure 1 indicates the site location and boundary plan. Figure 2 indicates the proposed development.

Location	Vacant land next to Edgar Wood Academy, Heywood Old Road, Middleton. Centred at National Grid Reference 385393E, 407487N.
Area	3.5 hectares.
Topography	106-115 metres above ordnance datum (AOD). Site is slopes up to the south-east.
Current Site Use	Vacant area of grassed land. A single shed is located in the north-west of the site.
Proposed Development	New school building and associated infrastructure including a nature walk.

Table 1-1: Summary of site details.

2. Historical Review

2.1. Historical Map Review

A Phase 1 Desk Study was undertaken by Wardell Armstrong (ref: GM11081/FINAL dated July 2020) for the wider site (including the LKC subject site) and the newly constructed Edgar Wood Academy on the land to the west.

In compiling the site history, LKC have utilised the mapping provided in the overarching PRA as well as other public domain maps / aerial photography.

Table 2-1 summarises features on site. Table 2-2 summarises potentially contaminative land uses within approximately 50m and potentially infilled features within approximate 250m.

Site Features	Location on Site	Dates Present		Comments
		From	To	
Old sand pit	S	1848	2025	Small 'old sand pit' labelled in southern corner of site. Annotated as pond / marsh on subsequent mapping. Can still be seen on latest LIDAR data.
Field	Whole	1848	2025	Site is part of a larger field.
Whittle Brook	NE	1893	2025	Brook flowing north-west. Still present on current mapping.
1no. building	N	2003	2025	Small building surrounded by an area with no vegetation. Not shown on any mapping but can be identified from 2003 aerial imagery.
Pond	E	2013	2022	Possible water filled natural depression. Water no longer present from 2019 but area is devoid of vegetation until 2022 when feature can no longer be seen on aerial imagery. Lidar data suggests this area is slightly lower than surrounding land.

Table 2-1: Summary of site features. Dates are based on available historical map editions.

Surrounding Area Features	Distance (m)	Direction	Dates Present		Comments
			From	To	
Sand pit	95	E	1848	1910	Sand pit east of Langly Hall. Replaced by marshland from 1922.
Fields	Adj.	N,E,S,W	1893	2023-2025	Site surrounded by fields. School developed adjacent to the west by 2023. House development ongoing north of the site.
Pond	70	E	1893	1955	Part of Langley Hall Estate. No longer mapped from 1973.

Table 2-2: Summary of potentially contaminative features within 50m and potentially infilled features within 250m. Dates are based on available historical map editions.

2.2. Additional Historical Information

Wardell Armstrong completed 6no. trial pits (TP11 to TP16) and 2no. boreholes (BH2 & BH3) on the subject site within the Phase 2 Ground investigation for the wider school site (ref: GM11081/FINAL dated July 2020). Plate 2-1 shows the locations of the exploratory holes on the LKC subject site.

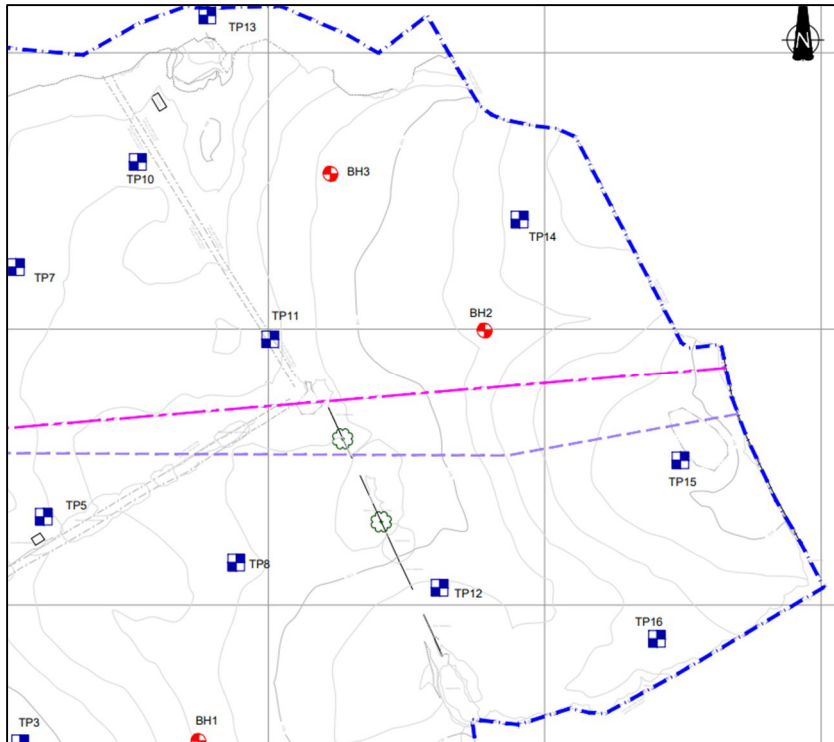


Plate 2-1: Extract of Exploratory Hole Location Plan from GM11081/FINAL.

Ground conditions and contamination assessment, from relevant exploratory holes, are summarised in Table 2-2 below.

Made Ground	No made ground was encountered on the site. The site is surfaced by grass over topsoil.
Superficial	Superficial deposits comprised soft to very stiff occasionally sandy and silty gravelly clay to 3-4mbgl. Very loose to medium dense sand was recorded between 0.70mbgl and 10.00mbgl and generally underlies the clay.
Bedrock	Bedrock was not encountered by the Wardell Armstrong investigation.
Groundwater	Shallow groundwater has been monitored across the site at depths between 0.80-7.56mbgl.
Obstructions	No obstructions were encountered.
Report Assessment and Observations for Contamination	No made ground was encountered on the subject site. All contaminants were below relevant screening values. The risk to human health was considered low. 6no. gas monitoring visits noted gas regime was CS1.

Table 2-2: Summary of Ground Conditions and contamination assessment.

3. Environmental Setting

A summary of environmental settings is presented in Table 3-1, based on a review of available environmental data.

Categories ^(data sources)			Details
Geology ^{1, 2}	Artificial Ground		No BGS recorded artificial ground.
	Superficial Deposits		Till (diamicton).
	Bedrock		Pennine Lower Coal Measures (Sandstone, siltstone, mudstone and coal).
	BGS Logs (100m)		None.
Hydro-geology ¹	Aquifer Designation	Superficial	Secondary Undifferentiated Aquifer.
		Bedrock	Secondary A Aquifer.
	Source Protection Zone (SPZ)		Site not within an SPZ.
	Groundwater Abstractions (100m)		None.
Hydrology ^{1, 3}	Surface Watercourses (100m)		Whittle Brook adjacent to the north flowing west.
	Flooding Risk ³		Flood Zone 1.
	Surface Water Abstractions (100m)		None.
	Discharge Consents (onsite)		None
	Pollution Incidents (onsite)		None.
Minerals & Mining ^{1,4}	Coal Mining		Within a Coal Reporting Area. Not within a Development High Risk Area.
	Surface Mineral Extractions (250m)		None.
	Non-Coal Mining Area		No hazard.
Ground Stability ¹	Collapsible Ground		Very low hazard.
	Compressible Ground		No hazard.
	Ground Dissolution		No hazard.
	Landslide		Very low hazard.
	Running Sand		Very low hazard.
	Shrinking / Swelling Clay		Very low hazard.
Landfill Sites (250m) ¹	Known / Registered		None
	Potentially Infilled Sites, based on LKC historical review		3no. features: See Table 2-1 and Table 2-2.
Radon Potential ⁵			1-3% of homes above Action Level. No protective measures are necessary in the construction of new dwellings or extensions. (England)
Designated Sites (50m) ¹			Green Belt 16m NW.
Contemporary Trade Directory (50m) ¹			None.
Fuel Station Entries (50m) ¹			None.
Unexploded Ordnance Risk (UXO) – Zetica Risk Map	Zetica Risk Map ⁶		Bomb Risk: Low. Strategic Targets: None identified within 100m.

Table 3-1: Summary of the environmental setting.

Notes: Distance in brackets is the distance from site that features are included. Where no distance given, features relate to onsite only.

Data Sources:

- 1 Groundsure Report within GM11081/FINAL
- 2 <http://mapapps2.bgs.ac.uk/geoindex/home.html>
- 3 <https://flood-map-for-planning.service.gov.uk/location>
- 4 The Mining Remediation Authority Web Mapping Services (WMS) / <http://coal.decc.gov.uk/en/coal/cms/publications/data/map/map.aspx>.
- 5 <https://www.ukradon.org/information/ukmaps>
- 6 Zetica UXO Unexploded Bomb Risk Map (Appendix A).

4. Site Reconnaissance

A site reconnaissance was carried out on 31st October 2025.

Relevant features identified on site are summarised below:

- The entire site is covered by rough grassland.
- There is one building on site - a wooden construction shed with decomposing straw on the floor. Appears to have been used to house horses. Discussions with the council have confirmed that the site was used for horses, but no horses have been on site since early 2025.
- The site is bounded by a disconnected electrical fence to the north, a barbed wire fence and security fence to the west and south bounding the school playing fields. Residential fence lines are located on the eastern boundary.
- The site generally slopes up to the south-east. A small valley is present in the north-west of the site close to the building.
- There are tyres buried in the ground in several locations.
- No visual or olfactory evidence of significant contamination identified.

The surrounding area comprises a school to the west, residential properties to the east and north and fields to the south.

Site photographs are provided in Table 4-2.

	
Photograph 1: View of site taken from the south-east facing north-west. School boundary fence can be seen in the background.	Photograph 2: Site boundary in the east. Taken from the west.
	
Photograph 3: Site access route in the west. Whittle Brook valley on the left of the image.	Photograph 4: Site access route from Heywood Old Road. Facing north-west.

Table 4-1: Site photographs.

5. Preliminary Conceptual Model

5.1. Introduction

The aim of the conceptual model is to provide a preliminary assessment of the likelihood of a pollutant linkage for each potential combination of contaminant, pathway, and receptor. A conceptual model can be used to make an informed decision on the contamination risks associated with the site and whether further site investigation work is required.

The sections below are therefore divided into potential contaminant, potential pathway and potential receptor as described in LCRM³, on the premise that, if there is no pollutant linkage, then there will be no risk to the receptor. The final section provides an assessment of the potential pollutant linkages that may still be present on the site if redevelopment were to occur.

5.2. Potential Contaminants

Potential viable contamination sources are detailed in Table 5-1. These are split into onsite sources, offsite sources and underlying geology.

Potential Source	Contaminants
On site	
Shallow made ground below some or all of site (e.g., site levelling, possibly filling of sand pit, pond)	Assuming predominantly reworked natural soils with possible demolition rubble, ash and clinker: asbestos, heavy metals, sulphates, PAHs ⁴ . Significant infilling of sand pit in south of site not anticipated given small size and feature shown on Lidar data. Significant thickness of infilling not anticipated within pond feature given small size. No made ground encountered within previous investigation. Not expected to be a significant source of gas given anticipated depth and nature of made ground.
Surrounding Area	
Surrounding area	No significant contamination sources within influencing distance of the site.
Landfills / offsite potentially infilled features within 250m	Given size, distance and age of features, there is not considered to be a significant source of hazardous gas.
Underlying Geology	
Pennine Middle Coal Measures	Ground Gas (principally carbon dioxide and methane) ⁵ . Potentially worked shallow coal seams could be a source of ground gas. No shallow coal workings anticipated below the site, no significant source of ground gas.
Radon Affected Area	1-3% of homes above Action Level. No protective measures are necessary in the construction of new dwellings or extensions. No further consideration required.
Superficial	Glacial Till. No significant contamination sources identified.

Table 5-1: Potential contamination sources.

5.3. Potential Receptors

Potential receptors are detailed in Table 5-2.

Receptors	
Human health	Future site users (including residents, visitors, and site workers).
Controlled waters	Whittle Brook adjacent to the north. Secondary A Aquifer.
Buildings.	
Potable water pipes.	

Table 5-2: Potential receptors.

5.4. Potential Pathways

Potential pathways are detailed in Table 5-3.

Pathways		
Soil	Human health ⁶ (Residential land use with soft landscaping)	Ingestion of soil. Ingestion of soil-derived indoor dust. Dermal contact with soil. Dermal contact with soil-derived indoor dust. Inhalation of soil-derived outdoor dust. Inhalation of soil-derived indoor dust. Inhalation of vapours outside. Inhalation of vapours inside. Omitted: ingestion of contaminated home-grown produce and ingestion of soil attached to home-grown produce.
Soil	Windblown dust and fibres to adjacent receptors.	
Soil	Direct contact with receptors (services).	
Surface water	Surface run-off over impermeable surface.	
Groundwater	Infiltration into the ground, through potentially contaminated material (contamination possibly going into solution).	
Groundwater and gas	Migration through potentially permeable strata and preferential pathways. Superficial (Till) likely to be low permeability. Superficial (sand and gravel) is likely to be relatively permeable. Bedrock (mudstone, siltstone, sandstone) likely to be variably permeable. No preferential pathways are anticipated.	
Gas	Migration into buildings (e.g., via services) and accumulation of gases in confined spaces (potentially causing explosion if methane is present).	

Table 5-3: Potential pathways.

5.5. Preliminary Contamination Conceptual Model

The Preliminary Contamination Conceptual Model is illustrated in Table 5-4.

Generic potential pollutant linkages are described along with an assessment of the risk based upon guidance on probabilities and consequences outlined in CIRIA C552⁷.

In order to assess the potential risk for each pollutant linkage, an assessment of the magnitude of the potential consequence (severity) of the risk occurring and the magnitude of the probability (likelihood) of the risk occurring has been considered and classified. This is based on the guidance provided in CIRIA C552 and further details including a risk matrix is provided in Appendix B.

The probability is based on the site history, site reconnaissance, environmental setting, pathways, and receptors.

Reasonable worst-case consequence has been assumed at this stage.

Where LKC identified a low to very low risk, targeted or low-density intrusive investigation work, a watching brief (during construction work) or no investigation work will be recommended. This will be dependent on the nature of the site and the proposed development.

Where the risk falls into the moderate/low risk, LKC will undertake an assessment to establish what further work will be required.

Where LKC identifies a moderate or higher risk, intrusive investigation work or precautionary remediation is recommended.

Recommendations are discussed further in Section 7.

Due to the minor consequence associated with the phytotoxic effect to flora (i.e., loss of plants in a landscaping scheme), the overall risk for the majority of sites will be very low to low. Where soils contain significant concentrations of heavy metals, in general there will other pollutant linkages (i.e., the risk to human health) that will trigger the requirement for remediation (e.g., a clean environmental cover system). As such the risk to flora associated with phytotoxic contaminants will not be considered further.

The risk to buildings associated with elevated sulphate will be considered as part of the geotechnical assessment and will not be included in the contamination risk assessment.

It should be noted that there may be risk from short term exposure from contaminated soil to site workers. The Preliminary Contamination Conceptual Model deals with long term exposure to key receptors. Acute risks can be easily mitigated by good environmental management of the site during site works. Standard health and safety precautions (as per HSE guidance⁸) should be adopted by all workers involved with site enabling and construction works. Therefore, this receptor is not considered in the contamination conceptual model.

PL	Contaminants of Concern (source)	Pathway	Receptor	Probability	Consequence	Risk	Assessment and Recommendations
1	Asbestos, heavy metals, PAHs (shallow made ground)	Dermal contact. Inhalation of soil, fibres, and dust. Ingestion of soils, dust, home-grown produce, soil attached to home-grown produce. Windblown dust.	Future site users.	Low Likelihood	Medium	Moderate / Low (localised)	Significant contamination not anticipated given the site history. No made ground encountered in previous investigation. Limited made ground likely around shed on site. The probability is considered low likelihood until ground conditions have been established on site. Recommendations: Site Investigation to confirm ground conditions with confirmatory testing.
2	PAHs such as naphthalene (shallow made ground)	Inhalation of vapours. Migration via permeable strata and preferential pathways.	Future site users.	Unlikely	Medium	Low	No significant source of volatile contamination noted from site history and the anticipated ground conditions below the site. Recommendations: Confirmatory intrusive investigation with testing as part of recommendations for PL1..
3	Hazardous / ground gas: methane, carbon dioxide (shallow made ground)	Migration via permeable strata and preferential pathways. Inhalation of gas. Explosion in confined spaces.	Future site users. Buildings.	Unlikely	Severe	Moderate / Low	Unlikely as no significant source of gas identified within influencing distance of the site. Previous investigation encountered CS1 conditions on site. Recommendations: No gas monitoring required unless evidence of significant thickness of organic and / or putrescible material identified on site.
4	Metals, PAHs (shallow made ground)	Surface run-off. Migration via permeable strata and preferential pathways. Perched waters migration.	Groundwater Surface water	Unlikely	Medium	Low	Unlikely as no significant source of mobile contamination identified. Recommendations: No further assessment required unless evidence of significantly mobile contamination identified on site.
5	PAHs such as naphthalene (shallow made ground)	Ingestion of tainted water supply.	Future site users. Water pipes.	Unlikely	Medium	Low	Unlikely due to limited to no made ground expected. Recommendations: Sampling required if made ground at possible pipeline depth. Water pipeline risk assessment required.

Table 5-4: Preliminary Contamination Conceptual Model.

Notes: PL = Pollutant Linkage. Contaminant of Concern (CoC) - See Table 5-1 for contamination sources. See Section 7 for recommendations.

6. Preliminary Geotechnical Risk Assessment

Table 6-1 summarises the possible geotechnical constraints of the site, based on the site history, environmental settings and site reconnaissance. Investigation work will be required to confirm the risks and provide a detailed geotechnical assessment and foundation design.

Coal Mining	Site is not within a Development High Risk Area. No further assessment required.
Slope Stability	A new access road is proposed along the crest of the Whittle Brook valley in the north of the site. Consideration should be given to the stability of the slope with addition loadings from the road.
Ground Stability Hazards	No to low hazard identified. No further action required.
Made Ground	Unknown depth and constituent of made ground across the site. Initial information indicates relatively shallow made ground. Unlikely to be a suitable founding stratum unless engineering work is undertaken. No made ground was encountered by the previous investigation.
Superficial	Clay from previous investigation was described as soft to very stiff. Sand described as loose to medium dense. Clay and sand encountered below site. Strata may be variable giving differential settlement.
Bedrock	Unknown depth to bedrock.
Groundwater	Shallow groundwater encountered by previous investigation. Shallow / fluctuating groundwater can affect the strength of the soil, particularly in granular ground. Shallow groundwater can also affect construction works.
Plasticity	Plasticity of clay deposits should be confirmed, particularly where trees are present or proposed, to identify the shrink / swell risk. Clay recorded on site.
Sulphate	Unknown sulphate content of the made ground and natural.
Road / Pavement Design	Unknown CBR values for footpath and road design.

Table 6-1: Summary of geotechnical constraints.

7. Summary Conclusions and Recommendations

7.1. Summary Conclusions

Table 7-1 summarises the site details, historical review, environmental settings and site reconnaissance.

Current Site Use & Pertinent Features	Vacant area of grassed land. A single shed is located in the north-west of the site.
Proposed Development	New school building and associated infrastructure including a nature walk.
Main Historical Features	Onsite: Field, pond, old sand pit, building. Surrounding Area: Fields, pond.
Geology / Hydrogeology	Artificial: No BGS recorded artificial. Superficial: Till deposits (Diamicton). Secondary undifferentiated Aquifer. Bedrock: Pennine Middle Coal Measures. Secondary A Aquifer.
Site Reconnaissance	Site comprises large open field with one building in the north-west.
Landfills / Infilled ground	No recorded landfills. Potentially infilled ground identified.

Table 7-1: Summary of site details, historical review, environmental settings and site reconnaissance.

A preliminary contamination conceptual model has been produced by LKC, which is summarised in Table 7-2.

Pollutant Linkage	Contaminants	Risk
PL1: Contaminants posing a risk to receptors via dermal contact, ingestion and inhalation (of soil, dust, fibres).	Asbestos, heavy metals, PAHs	Low
PL2: Volatile contaminants posing a risk to receptors via the inhalation of vapours.	PAHs,	Low
PL3: Gas posing a risk to buildings and receptors via the migration of gas into building causing explosion and asphyxiation.	Hazardous Gas	Moderate / Low
	Ground Gas	Moderate / Low
PL4: Mobile contamination posing a risk to controlled waters via the migration through permeable strata.	Heavy metals, PAHs	Low
PL5: Organic contaminants posing a risk to receptors.	PAHs	Low

Table 7-2: Summary risk table.

A preliminary geotechnical assessment has been carried out by LKC. Table 7-3 summarises the geotechnical constraints.

Coal Mining	Site is not within a Development High Risk Area. No further assessment required.
Slope Stability	A new access road is proposed along the crest of the Whittle Brook valley in the north of the site. Consideration should be given to the stability of the slope with addition loadings from the road.
Made Ground	Unknown depth and constituent of made ground across the site.
Superficial	Unknown strength of soils for foundation design.
Bedrock	Bedrock expected to be relatively deep.
Groundwater	Unknown depth and variability of groundwater.
Plasticity	Plasticity of clay deposits should be confirmed.
Sulphate	Unknown sulphate content of the made ground and natural.
Road / Pavement Design	Unknown CBR values for footpath and road design should be calculated.

Table 7-3: Summary of geotechnical constraints.

Based upon the available information, LKC conclude there is a viable contamination and geotechnical risk and therefore further assessment is recommended.

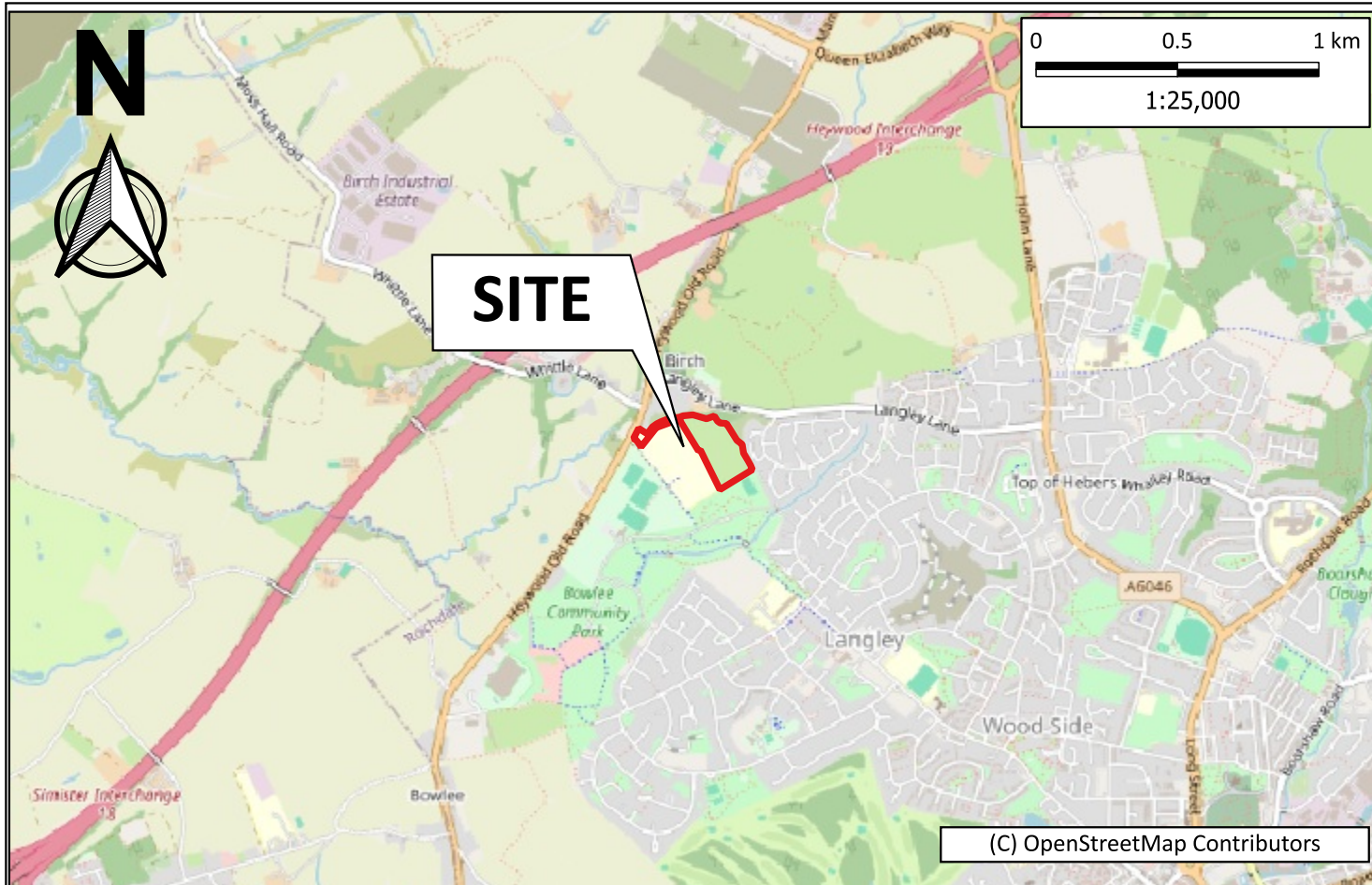
7.2. Recommendations

Recommendations are provided in Table 7-4.

Contamination Status	There is sufficient information on the potential contaminative status of the site to allow conditional approval of a planning application, based on the proposed end use detailed in the PRA.
Further Assessment Recommendations	Phase 2 investigation to be carried out in line with current guidance, including BS10175 ⁹ , BS5930 ¹⁰ CIRIA C665 ¹¹ , RB17 ¹² and BS8485 ¹³ . Targeted investigation locations in areas of concern (contamination and geotechnical).
Type of Investigation Work	Boreholes and / or trial pits for geotechnical investigation.
PL 1, 2, 4, 5	Intrusive investigation work recommended to confirm ground conditions across the site. Testing of contaminants of concern based on preliminary conceptual model and field observations (PID tests and visual / olfactory evidence).
PL3	No further assessment required.
Reporting	Information from the above can be used to carry out a contamination and geotechnical assessment and provide a remediation strategy for the site.

Table 7-4: Recommendations.

Figures



Client: Equilibrium Architects Ltd				Title: Site Location & Boundary Plan		 LK CONSULT
Site: Heywood Old Road, Middleton				Scale (see scale bar): 1:25,000 & 1:2,500 @ A4		
Drawing No.: LKC 251564 Drawn By: MB Checked By: CC Drawn: Nov 2025				Figure: 1		



KEY

Site Boundary

Sampling Locations and features annotated by LK Consult Ltd are approximate and are based upon observed measurements unless otherwise stated. Do not scale from this drawing and work from marked dimensions only. All dimensions and features should be confirmed on site by the Contractor. Where this drawing includes information provided to LK Consult Ltd by others, LK Consult Ltd gives no warranty, representation or assurance as to the accuracy of such information.

Client:

Equilibrium Architects Ltd

Site:

Heywood Old Road, Middleton

Title:

Proposed Development Plan

Job No.:

LKC251564

Scale (See Scale Bar):

See Scale Bar

Figure:

2

Revision:

1

Drawn By:

CC

Checked By:

LD

Drawn:

Dec 2025

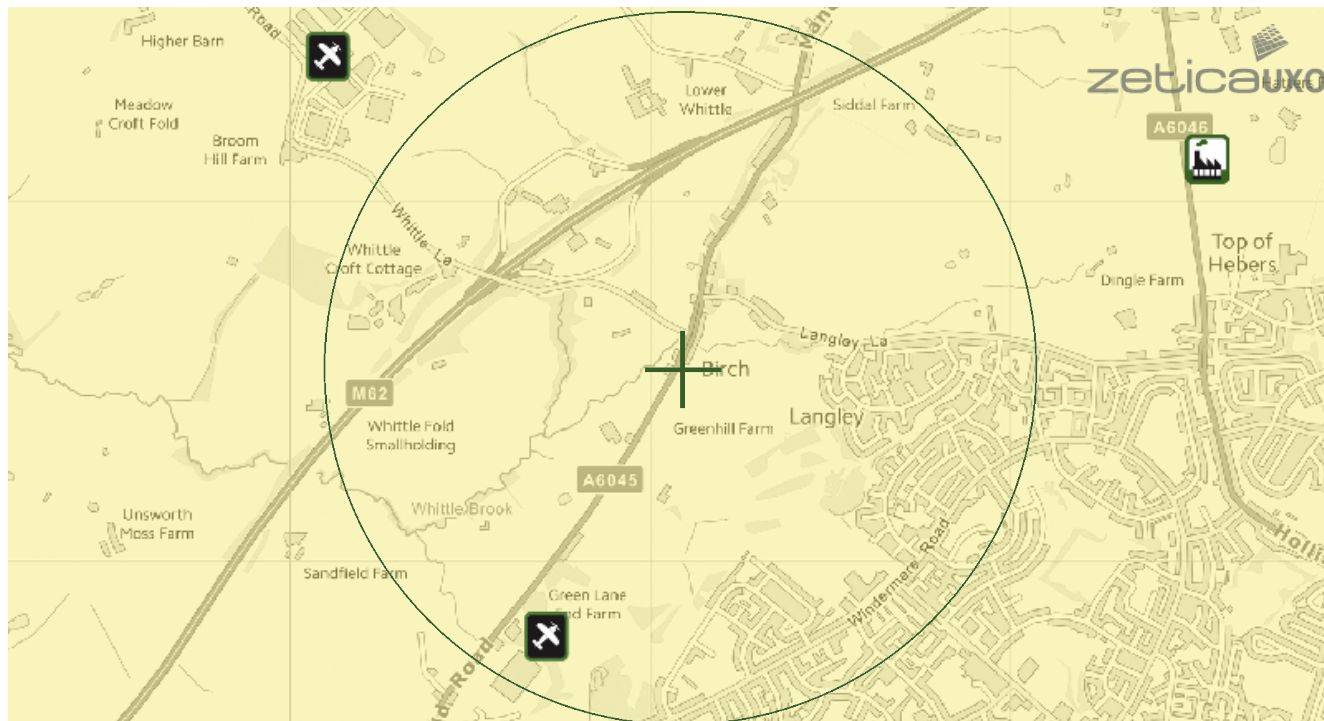
Appendix A – Zetica UXO Unexploded Bomb Risk Map

UNEXPLODED BOMB RISK MAP



SITE LOCATION

Location: OL10 2QN,
Map Centre: 385055,407540



This map principally indicates a hazard from Unexploded Bombs (UXB) due to WWII bombardment. Other sources of Unexploded Ordnance (UXO) may be present. It should be noted that this map does not represent UXO risk and should not be reported as such when reproduced.

LEGEND

- High:** Areas indicated as having a bombing density of 50 bombs per 1000acre or higher.
- Moderate:** Areas indicated as having a bombing density of 15 to 49 bombs per 1000acre.
- Low:** Areas indicated as having 15 bombs per 1000acre or less.

- Military
- Industry
- UXO find
- Other
- Transport
- Docks
- Luftwaffe targets
- Utilities
- Bombing decoy
- Airfields

How to use your Unexploded Bomb (UXB) risk map?

This map indicates the potential for UXBs to be present because of World War Two (WWII) bombing. It can be incorporated into a technical report, such as a Phase 1 Desk Study, or similar document as an indication of the potential for UXO encounter on a Site. Other sources of UXO may also be indicated, although note that these are not comprehensive and more detailed research is required to confirm their presence.

What if my Site is in a moderate or high density area?

We typically recommend that a detailed UXO desk study and risk assessment is undertaken for sites in an area with a moderate or high bombing density. Additionally, if your site is in close proximity to a strategic target, military establishment, airfield or bombing decoy, then [additional detailed research](#) is recommended.

If my site is in a low risk area, do I need to do anything?

If both the map and other research confirm that there is a low potential for UXO to be present on your site, then, subject to your own comfort and risk tolerance, works can proceed with no special precautions.

If you are unsure whether other sources of UXO may be present, you can request one of our [pre-desk study assessments \(PDSA\)](#) by emailing a site boundary and location to pdsa@zetica.com.

You should never plan site work or undertake a risk assessment using these maps alone. More detail is required, to include an assessment of the likelihood of a source of UXO hazard from other military activity not reflected on these maps.

If I have any questions, who do I contact?

tel: [+44 \(0\) 1993 886682](tel:+441993886682) email: uxo@zetica.com web: www.zeticauxo.com

The information in this UXB risk map is derived from a range of sources and should be used with the [accompanying notes on our website](#).

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Appendix B – Risk Evaluation

RISK EVALUATION

The method for risk evaluation is a qualitative method of interpreting the output from the risk estimation stage of the assessment, based on CIRIA 552¹⁴. It involves the classification of the:

- Magnitude of the potential consequence (severity) of the risk occurring (Table A).
- Magnitude of the probability (likelihood) of the risk occurring (Table B).

Consequence (Severity)		
Classification	Definition	Example
Severe	Short term (acute) risk to human health likely to result in 'significant harm' as defined by the Environment Protection Act 1990, Part IIA. Short term risk of pollution (note: water Resources Act contains no scope for considering significance of pollution) of sensitive water resource. Catastrophic damage to buildings/properties. A short-term risk to a particular ecosystem, or organism forming part of such ecosystem (note: the definition of ecological systems within the Draft Circular on Contaminated Land, DETR, 2000).	High Concentrations of cyanide on the surface of an informal recreation area. Major spillage of contaminants from site into controlled waters. Explosion, causing building collapse (can also equate to short term human health risk if buildings are occupied).
Medium	Chronic damage to Human Health ('significant harm' as defined in DETR, 2000). Pollution of sensitive water resources (note Water Resources Act contains no scope for considering significance of pollution). A significant change in a particular ecosystem, or organism forming part of such ecosystem.	Concentrations of a contaminant from site exceed generic, or site-specific assessment criteria. Leaching of contaminants from a site to a major or minor aquifer (Principal and Secondary). Death of a species within a designated nature reserve.
Mild	Pollution of non-sensitive water resources. Significant damage to crops, buildings, structures, and services ('significant harm' as defined in DETR, 2000). Damage to sensitive buildings/structures/services or the environment.	Pollution of non-classified groundwater. Damage to building rendering it unsafe to occupy (e.g., foundation damage resulting in instability).
Minor	Harm, although not necessarily significant harm, which may result in a financial loss, or expenditure to resolve. Non-permanent health effects to human health (easily prevented by means such as personal protective clothing etc). Easily repairable damage to buildings, structures, and services.	The presence of contaminants at such concentrations that protective equipment is required during site works. The loss of plants in a landscaping scheme. Discoloration of concrete.

Table A. Classification of Consequence

Probability (Likelihood)	
Classification	Definition
High Likelihood	There is a pollutant linkage and an event that either appears very likely in the short term and almost inevitable over the long term, or there is evidence at the receptor of harm or pollution.
Likely	There is a pollutant linkage, and all the elements are present and in the right place, which means that it is probable that an event will occur. Circumstances are such that an event is not inevitable, but possible in the short term and likely over the long term.
Low Likelihood	There is a pollutant linkage and circumstances are possible under which an event could occur. However, it is by no means certain that even over a longer period such event would take place and is less likely in the shorter term.
Unlikely	There is a pollutant linkage, but circumstances are such that it is improbable that an event would occur in the very long term.

Table B. Classification of Probability.

These classifications are then compared to indicate the risk presented by each pollutant linkage (Table C). It is important that this classification is only applied where there is a possibility (which can range from high likelihood to unlikely) of a pollutant linkage existing.

		Consequence			
		Severe	Medium	Mild	Minor
Probability	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

Table C. Comparison of Consequence against Probability

Once the risk has been determined the corresponding action can be assessed (Table D).

Risk	Action Required
Very High Risk	There is a high probability that severe harm could arise to a designated receptor from an identified hazard, OR there is evidence that severe harm to a designated receptor is currently happening. This risk, if realised, is likely to result in a substantial liability. Urgent investigation (if not already undertaken) and remediation are likely to be required.
High Risk	Harm is likely to arise to a designated receptor from an identified hazard. Realisation of the risk is likely to present a substantial liability. Urgent investigation (if not undertaken already) is required and remedial works may be necessary in the short term and are likely over the longer term.
Moderate Risk	It is possible that harm could arise to a designated receptor from an identified hazard. However, it is either relatively unlikely that any such harm would be severe, or if any harm were to occur it is more likely that the harm would be relatively mild. Investigation (if not already undertaken) is normally required to clarify the risk and to determine the potential liability. Some remedial works may be required in the longer term.
Low Risk	It is possible that harm could arise to a designated receptor from an identified hazard, but it is likely that this harm, if realised, would at worst normally be mild.
Very Low Risk	There is a low possibility that harm could arise to a receptor. In the event of such harm being realised it is not likely to be severe.

Table D. Description of the Classification and Likely Action Required.

Where a very low risk is identified no specific remediation is required.

Where a low risk is identified, some form of remediation may be required depending on the pollutant linkage, the type and concentration of contaminants present and the proposed development.

Where there is a moderate/low risk identified, an assessment will be undertaken to establish what category the pollutant linkage will fall into.

Where LKC identifies a moderate or higher risk, remediation or further investigation work is recommended.

Appendix C - References

¹ Environment Agency, October 2020, "Land contamination risk management (LCRM). How to assess and manage the risks from land contamination".

² Ministry of Housing, Communities and Local Government, December 2024, "National Planning Policy Framework".

³ Environment Agency, October 2020, "Land contamination risk management (LCRM). How to assess and manage the risks from land contamination".

⁴ DEFRA & Environment Agency, March 2002, "Potential Contaminants for the Assessment of Land", R&D Publication CLR 8.

⁵ CL:AIRE, October 2021, "Good Practice for Risk Assessment for Coal Mine Gas Emissions".

⁶ Environment Agency, January 2009, "Updated technical background to the CLEA model", Science Report SC050021/SR3.

⁷ CIRIA, January 2001, "Contaminated land risk assessment. A guide to good practice", C552.

⁸ Health & Safety Executive, 1991, "Protection of Workers and the General Public during the Development of Contaminated Land", HSG66.

⁹ The British Standards Institution (BSI), December 2017, "Investigation of potentially contaminated sites. Code of practice - Code of practice", BS 10175:2011+A2:2017.

¹⁰ The British Standards Institution (BSI), May 2020, "Code of practice for ground investigations", BS 5930:2015+A1:2020.

¹¹ CIRIA, December 2007, "Assessing risks posed by hazardous ground gases to buildings", C665.

¹² CL:AIRE, November 2012, "A Pragmatic Approach to Ground Gas Risk Assessment", RB 17.

¹³ The British Standards Institution (BSI), January 2019, "Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings", BS 8485:2015+A1:2019.

¹⁴ CIRIA, January 2001, "Contaminated land risk assessment. A guide to good practice", C552.

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