



GEO-ENVIRONMENTAL CONSULTING

BEK Geo-Environmental Consulting

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Dear Kabir

Desk Based Coal Mining Risk Assessment – Land at Chapel St, Knowsley

INTRODUCTION

BEK Enviro (BEK) has been commissioned by 68K Red & Black Limited to carry out a Coal Mining Risk Assessment for a parcel of land located at Chapel St, Knowsley (hereafter referred to as 'the site') to assess the risks from subsidence associated with historical coal mining at and close to the site.

The site is shown in Figure 1 below:



Figure 1: Aerial Image for the Site

The objectives of the Coal Mining Risk Assessment are to:

- Present a desk-based review of selected items of available information on the coal mining issues which are relevant to the application site;
- Use that information to identify and assess the risks to the proposed development from coal mining legacy, including the cumulative impacts of issues;
- Set out appropriate mitigation measures to address the coal mining legacy issues affecting the site, including any necessary intrusive site investigation works and/or remedial works and/or demonstrate how coal mining issues have influenced the proposed development;
- Demonstrate to the Local Planning Authority that the application site is, or can be made, safe and stable to meet the requirements of national planning policy with regard to development on unstable land.

To achieve the objective BEK will review the following information:

- Coal Authority website 'interactive map'
- British Geological Society (BGS) website
- OS Plans
- Groundsure Environ+GeoInsight Report

Limitations

The conclusions and recommendations presented in this report are the result of our professional interpretation of the information currently available. BEK reserves the right to amend the conclusions and recommendations if further information becomes available.

However, it should be noted that much of the information has been derived from reports written by others and BEK takes no responsibility for the accuracy of that information. Notwithstanding the above, the reports reviewed have all been written by professional environmental consultants with a duty of care to provide relevant and accurate information.

BACKGROUND

The site occupies a 200 m² roughly square shaped plot of vacant derelict land located off Chapel Street, Knowsley. The National Grid Reference for the centre of the site is 346794, 392870.

An engineer from BEK visited the site in July 2023 to carry out a site walkover/inspection.

The site visit confirmed the majority of the site is overlain with hardstanding, this is noted to be red broken concrete in the west and small section of mosaic tiles in east which is indicative of the floor of former buildings. Grass and small shrubs grow through cracks/breaks in the concrete floor and the areas adjacent.

The southern site boundary is marked by a brick wall which forms the rear of a two-storey beauty studio. A emergency staircase from the studio is located adjacent to the south-east corner of the site. The eastern site boundary is marked by brick wall which is the rear of an adjacent restaurant. A number of ventilation pipes and air conditioning units are located on the wall. Chaple Street marks the western site boundary. The northern site boundary is marked by metal fencing beyond which is an open yard area.

This report has been prepared to support a planning application for the construction of 5 residential apartments.

The proposed development layout is presented Aldrock Surveyors Limited Drawing No: 001-A, dated July 2023, an extract of which is presented as Figure 2.

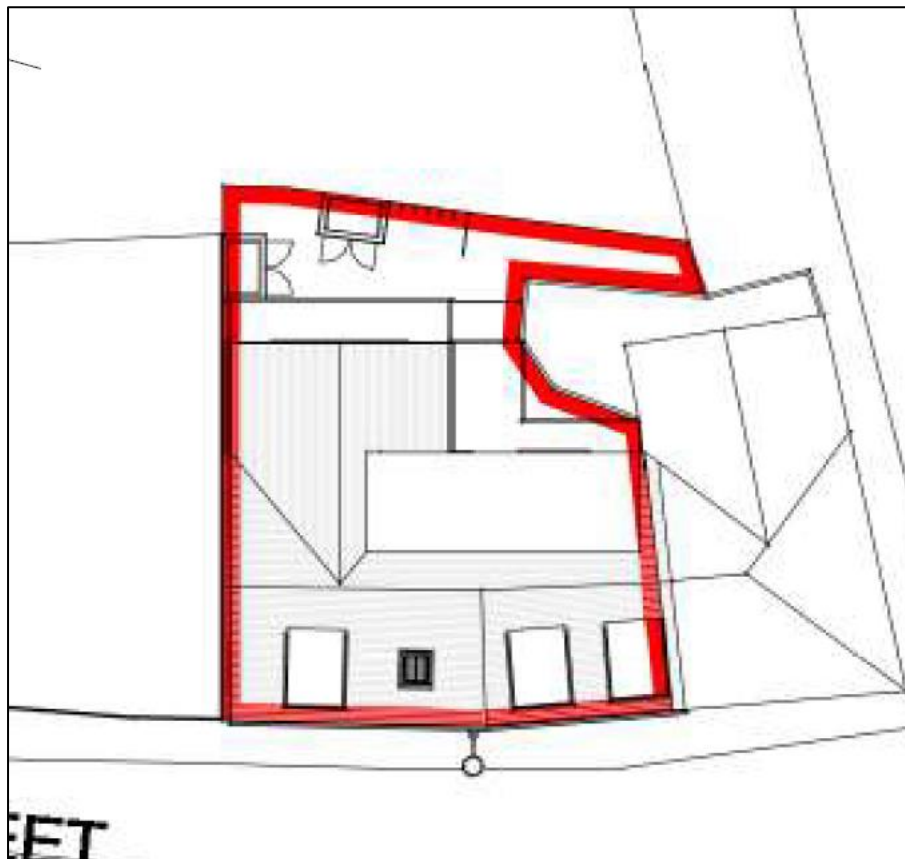


Figure 2: Proposed Development Layout

PREVIOUS WORK

BEK has prepared a Phase 1 – Preliminary Risk Assessment (PRA) for the site (Ref: BEK-23094-1-RevA, dated December 2023). The site history and environmental setting are summarised in the following sections.

Site History

1852 – 1893 – 1908 – 1927 - 1937

These maps show the site to be located in an area of mixed industrialised and residential land use. The site is occupied by a row of terraced residential properties that front on to Short Street that marks the western site boundary. There are private yards in the east of the site with pumps considered to be associated with wells. There are some unspecified buildings located to the east (possibly light industrial) with a park beyond. There is a Chapel and School Room to the west (beyond Short Street). The land to the north and south is generally dominated by residential properties. The pumps are no longer present from 1893 maps onwards.

1954–2003

These maps show no significant change to the site. The buildings to the east have been extended and suggest a large industrial building use. A review aerial imagery taken of the site from 2000 indicated the building to the north of the site have been demolished and are no longer present.

2005-2023

A review of Google earth satellite imagery indicated the building on site has been demolished and is no longer present from the 2005 onwards. The site remains unchanged until present. Figure 1 below is an aerial image taken of the site from 2019.



Figure 1: Aerial Image of the Site from 2019 (from Enviro+GeoInsight Report)

Environmental Setting

Category		Comments
Geology	Artificial	There is no record of made ground (artificial deposit) on the site or within 250 m of the site.
	Superficial	This is no recorded superficial geology. The areas surrounding the site are overlain by superficial deposits of Boulder Clay (213 m east, 351 m south, >500 m west and circa 500 m north).
	Bedrock	The underlying solid geology comprises of the Pennine Lower Coal Measures Formation which is dominated by sandstone.
	Linear Features	There are two linear features located within 250 m of the site. The closest of which refers to a Rock – coal seam, inferred located some 140 m north of the site.
Hydrogeology	Superficial	There is no classification for an aquifer within the superficial strata as it is considered to be absent on geological maps.
	Bedrock	The underlying bedrock is also classified by the Environment Agency as a ‘Secondary A Aquifer’.
Hydrology	Nearest Surface Water	There are no surface water features located on/within 250 m of the site
	Discharge Consents	No current licensed discharges to controlled waters within 250m of the site.
	Pollution Incidents	There are no EA recorded pollution incidents located within 250 m of the site.
Mining	Coal Mining Consultation Area	The site is located within a coal mining area as defined by the Coal Authority. Furthermore, reference to the Coal Authority Interactive Map suggests that the site is located within a ‘Development High Risk Area’. There is one surface ground working within 250 m of the site. This is referred to as Identified Ground Workings some 187 m to the north-west dated 1925.
Landfill Sites	Historic or Current	There are no historic/current or active landfills within 250 m of the site.
Radon	Less than 1% of homes are above the action trigger level’ and that no radon protective measures are necessary in the construction of new dwellings or extensions.	

Previous Site Investigations

BEK has sought site investigation information from the BGS website. There are five BGS boreholes available to view within 250 m of the site. The closest borehole is located 221 m south-west of the site. The boreholes reviewed and their distance/directions from the site are provided within the table below:

Borehole Reference	Distance/Direction	Date	Borehole Depth (m)
SJ49SE227	221 m South-west	<i>Undated</i>	1.7
SJ49SE228	223 m South-west	<i>Undated</i>	1.7
SJ49SE246	227 m North-west	July 1989	40
SJ49SE248	227 m West	May 1989	26.0
SJ49SE247	242 m West	May 1989	36.0

Table 1: Summary of Reviewed Boreholes

The exploratory locations referenced SJ49SE227 and SJ49SE228 represented trial pits which were terminated in the superficial deposits (providing no information pertaining to shallow coal mining).

The borehole entitled 'SJ49SE246' encountered made ground in the form of 'soil and ash' to 2.4 m. 'Sands and Gravel' were identified to 9.0 m which was underlain by mudstone with interbedded siltstone bands to 31 m followed by siltstone to 40 m. Two small lenses of coal and shale were encountered within the borehole at depth of 9 m to 9.15 m and 27.50 m to 28.60 m respectively.

The borehole entitled 'SJ49SE248' encountered made ground topsoil to a depth of 0.5 m. 'Sand and Gravel' were identified to 4.5 m. This was underlain by 'mudstone' interbedded with 'siltstone'. 'Shale with trace of coal' were encountered between 6.7 and 6.85 m. 'Coal and shale – wet' was encountered between 15.1 m and 15.6 m.

The borehole entitled 'SJ49SE247' encountered made ground in the form of 'stone fill' to a depth of 0.5 m. 'Red sand and gravel – wet' was encountered to 5.8 m. This was underlain by 'mudstone' to a depth of 9.4 m when a thin lense of 'coal and shale' extended to 10 m. 'Mudstone' was encountered to a depth of 14 m when a thin layer of siltstone was encountered to 14.2 m. 'Silty Mudstone' was encountered at the base of the borehole which terminated at 20 m.

None of the viewed published boreholes recorded voids. However, intact coal with shales were recorded in all of the boreholes drilled beyond 200 m to the west of the site. BEK cannot rule out voids at shallow depth below the site given the coal mining history of the area and that the site is located in a Coal Mining Reporting area and a Development High Risk Area.

COAL AUTHORITY DATA

The site is located within a Coal Authority (CA) defined coal mining consultation area.

The CA operates a risk based approach to the assessment of potential instability issues associated with future development of land located within the pre-defined Coal Authority Consultation Area. This risk based approach divides the potential risk into Development Low Risk Areas and Development High Risk Areas.

Low Risk Sites are deemed to be land where coal mining has taken place, however it was at such depth not to pose a risk to new development and it therefore contains no known recorded risks and as such no further assessment is required.

For Low Risk Sites, the Coal Authority state that 'there is no need for you to submit any coal mining information with your planning application and The CA will not be consulted by the LPA'.

High Risk Sites are deemed to be landholdings located within an area known to contain legacy risks that include:

Mine entries (shaft or adit);
Shallow Coal Workings (recorded and probable);
Workable coal seam outcrops;
Mine gas sites and areas;
Recorded coal mining related hazards;
Geological features (fissures and break lines); and,
Former surface mining sites (sometimes using historic opencast extraction methods).

Coal Mining Information

To determine if a site may have coal mining issues requires a consideration of a wide range of information, and BEK has completed a review of relevant information in relation to potential coal mining activities.

The Groundsure report indicates that the site is located in a coal mining area as defined by the Coal Authority. There is one surface ground working within 250 m of the site. This is referred to as Identified Ground Workings some 187 m to the north-west dated 1925. There are no underground ground workings within 250 m of the site.

Information presented on the Coal Authority interactive map indicates that the site is located in a Coal Mining Reporting area.

The site is located in a probable shallow coal mining area. As such, the site is situated within a 'development high risk' area. (see Figure 3).



Figure 2: Development High Risk Area

The probable shallow coal mining area is associated with the with the potential working of the outcrop situated to the north of the site which appears to dip below the site (see Figure 4).



Figure 3: Coal Outcrops

The closest mine entry to the site lies approximately 100 m east and is not considered to impact on the proposed development site

The key issue are associated with probable shallow coal mine workings along the coal outcrop that is situated to the north of the site and appears to dip below the site.

COAL MINING RISK ASSESSMENT

The Coal Authority interactive map indicates that the site is located in a Coal Mining consultation zone and entirely within a 'Development High Risk Area'. A coal seam outcrops to the north of the site, dipping beneath the site.

Considering the proposed development across the majority of the site, a more detailed assessment will be required to determine risks associated with subsidence due to historic mine workings.

A desk-based assessment cannot conclude with certainty the extent of the coal mining risks on site, and it is recommended that intrusive investigation works are undertaken on site.

RECOMMENDATIONS

It is recommended that a series of rotary open-hole boreholes are drilled to a depth of 30 m. The borehole locations will need to consider the proposed location of the new build as well as workings. A Coal Authority 'Permit to Drill' will be required prior to the commencement of site investigation at the site.

The aim of the boreholes is to confirm the presence or otherwise of coal seams at shallow depth below the site and to establish if they contain mine workings. If mine workings are confirmed to be absent, or beyond an influencing depth of the surface development, it is unlikely that special foundation measures or remediation will be required.

However, if mine workings are confirmed to be present within an influencing depth of the surface development, it is likely that special foundations (reinforced strips/semi rafts) and/or ground stabilisation by grouting will be required.

The findings of the intrusive investigation will be reported in a ground investigation report. This report will discuss the scope of the mitigation measures needed (if any) to ensure the development is safe from coal mining related ground instability.

I trust the above is satisfactory. Should you require anything further please do not hesitate to contact the undersigned.

Yours sincerely



MICHAEL BUCKLEY

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Revision	Comments	Date	Revised By	Checked By