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DESK STUDY WITH WALKOVER SURVEY

**AT
LAND ADJACENT TO
27-29 TARN DRIVE,
BURY,
BL9 9QB**

**PREPARED FOR
SAEID TAPEH**

**REPORT NO. 8305A
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CONTENTS

1	INTRODUCTION.....	1
1.1	Site Location and Description.....	1
1.2	Proposed Development and Purpose of the Desk Study	1
1.3	Walkover Survey.....	2
1.4	Previous Investigations.....	2
1.4.1	Geological and Mining Risk Assessment Ref. 8305.....	2
2	DESK STUDY	3
2.1	Historical Appraisal.....	3
2.2	Geological Appraisal	5
2.2.1	Artificial Ground (Made Ground).....	5
2.2.2	Superficial Geology (Drift Deposits).....	5
2.2.3	Bedrock Geology.....	5
2.2.4	Potential Hazards in Natural Ground.....	6
2.3	Mining, Radon, Soil Chemistry and Railway Infrastructure Appraisal.....	6
2.3.1	Mining and Ground Workings.....	6
2.3.2	Radon.....	7
2.3.3	Soil Chemistry.....	7
2.3.4	Railway Infrastructure.....	7
2.4	Environmental Appraisal	7
2.4.1	Historical Industrial Land Use.....	7
2.4.2	Landfill.....	7
2.4.3	Waste.....	8
2.4.4	Current Industrial Land Use.....	8
2.4.5	Sites Determined as Contaminated Land.....	8
2.4.6	Control of Major Accident Hazards (COMAH).....	8
2.4.7	Regulated Explosives Sites.....	8
2.4.8	Hazardous Substance Storage and Usage.....	8
2.4.9	Historical Licenced Industrial Activities (IPC).....	9
2.4.10	Licenced Industrial Activities (Part A(1)).....	9
2.4.11	Part A(2) and Part B Authorisations.....	9
2.4.12	Radioactive Substance Authorisations.....	9
2.4.13	Licensed Discharges to Controlled Waters.....	9
2.4.14	Pollutant Release to Surface Waters (Red List).....	9
2.4.15	Pollutant Release to Public Sewers.....	9



2.4.16	List I and List II Dangerous Substances	9
2.4.17	Pollution Incidents	9
2.4.18	Pollution Inventory Substances	10
2.4.19	Pollution Inventory Waste Transfers	10
2.4.20	Pollution Inventory Radioactive Waste	10
2.4.21	Hydrogeology	10
2.4.22	Hydrology	11
2.4.23	Flooding	11
2.4.24	Environmental Designations	11
2.4.25	Visual and Cultural Designations	12
2.4.26	Agricultural Designations	12
2.4.27	Habitat Designations	12
2.5	Conceptual Ground Model	13
2.5.1	Sources	13
2.5.2	Pathways	13
2.5.3	Receptors	13
2.5.4	Conclusions	14
3	GENERAL	15
4	REFERENCES	17

APPENDICES

Preliminary Risk Rating Guidance
 Photographs
 Enviro+Geo Insight Report
 Coal Authority Mining Report
 Small Scale Survey Plans
 Large Scale Survey Plans
 Figures



EXECUTIVE SUMMARY

This executive summary is a brief summary only and should be read in conjunction with the full report.

Section	Subject	Summary
Site Details	Site Address	Land adjacent to 27-29 Tarn Drive, Bury, BL9 9QB.
	Grid Reference	380345E, 408975N.
	Current Land Use	Undeveloped grassed open space adjacent to residences.
	Proposed Development	A three floor detached residence with associated parking and gardens.
Site History	On Site	In the earliest survey (1848-1851) the site was an undeveloped field. By 1937 a tennis court was built across the site, and removed by 1956-1957, by which point a playground was present in the eastern half of the site. This playground was removed by 1984-1985, when Lakeland Crescent was built along the eastern site boundary. Trees present in the centre and south of the site were cut down by 2018.
	Beyond Site Boundary	In the earliest survey (1848-1851) the area around the site was almost entirely undeveloped, with a road (Manchester Road, A56) 100m east and several residences 60m northwest, 90m east, 120m northeast and 200m south, along with a workhouse 200m south. By 1890 a spring was present 20m to the northwest (infilled by 1910), and a public house was constructed 65m to the east. A timber yard and building material works were noted from 130m to the south, potentially related to the earlier workhouse. A tramway was built along Manchester Road 100m east by 1910, and removed by 1957-1957. By 1930 the timber yard was removed and the building material works building was expanded and turned into a tannery with an associated sludge bed, reservoir and refuse heap 200m to the south, removed and infilled by 1956-1957 respectively following conversion of the tannery to a rubber works. Tarn Drive constructed along the northern site boundary by 1937, along with associated houses from 20m northwest. An unspecified building is constructed adjacent to the western site boundary by 1956-1957 (labelled 29 Tarn Drive by 1970-1974). By 1956-1957, earthworks were noted 10m to the east (removed by 1970-1974) and 30m to the north. Lakeland Crescent and an electricity substation were built along the eastern and southern site boundaries by 1984-1985, along with an associated residential development up to 170m to the south and 120m to the southwest. Domestic garages built 100m to the west by 1970-74 demolished by 1984-1985. Industrial units were constructed 200m to the south by 2005, and an area 210m to the west was developed into an industry associated storage yard by 2018.
Geological and Mining Appraisal	Made Ground	No Made Ground indicated on site, however due to previous development some may be present.
	Superficial Geology	River Terrace Deposits (sand and gravel) on site, Devensian Till (Diamicton, poorly sorted gravely sandy silty clay) 21m northeast.
	Bedrock Geology	Trencherbone Rock (sandstone) on site, Pennine Lower Coal Measures Formation (mudstone, siltstone and sandstone) 37m northeast.
	Radon	Radon protection measures are not required.
	Mining	Three historical surface excavations, nearest 20m north between 1928 and 1938. The Coal Authority indicate there is a potential for coal mining beneath the site or within 1km of the site boundary, and that there are probable unrecorded shallow workings of coal. A rotary borehole investigation is recommended.
	Subsidence Hazards	The hazard rating from natural subsidence hazards is very low to negligible.

Environmental Appraisal	Landfill Sites	Three unregistered landfills (infilled ponds), nearest 10m northwest infilled by 1910, most recent 200m to the south infilled by 1956-1957. A refuse heap is also present 208m to the south, dated 1928. These are unlikely to affect the site.
	Hydrogeology	Superficial deposits and bedrock both comprise a Secondary A aquifer. The vulnerability of groundwater to pollution is low.
	Hydrology	No watercourses or surface water features within 250m of the site boundary.
	Flood Risk	Site is within a Flood Zone 2, a Flood Risk Assessment will be required.
	Industrial Land Uses	Fifteen historical and ten current industrial land uses identified. Historical land uses include unspecified ground workings (20m north 1928-1938), garages (nearest 126m south 1971-1987, most recent 137m southeast 1989-1995) and tanneries (nearest and most recent 156m south by 1955). Current land uses include an electricity substation (2m south), vehicle repair, testing and servicing works (nearest 149m southeast), and a closed petrol station (225m southeast).
	Other Relevant Details	None.
Recommendations	The conceptual ground model indicates that a nominal intrusive ground investigation is required to assess the ground conditions and obtain samples for PCB testing adjacent to the electricity substation. In addition, if a significant thickness of Made Ground is found to be present soil samples should be obtained for contamination analysis and asbestos detection and, where possible, groundwater and surface water samples for contamination analysis. In addition, the conceptual ground model indicates that ground gas monitoring is not required unless a significant thickness of Made Ground is encountered in site. If substantial Made Ground is present gas standpipes should be installed and monitored over an extended period of time to allow for an assessment to be made. As stated in the Geological and Mining Risk Assessment dated December 2025, ref. 8305, we recommend that a minimum of two rotary boreholes are taken out to 30m depth followed by a ground stability assessment in order to determine whether remedial measures are required for the proposed development. Also where mineworkings are found at shallow depth there is a potential for accumulated mine gas migrating to the surface or near surface level. Given this scenario consideration should be given to installing standpipes and undertaking ground gas monitoring followed by a ground gas risk assessment.	
Other Considerations (for Warranty Providers, Building Control, Structural Engineers, Developers, etc.)	Listed below are various items that are likely to be required at some point during the development and it would be cost effective to have them carried out simultaneously. This is not an exhaustive list. • Boreholes and laboratory testing to assess the ground conditions for foundation design. • BRE Digest 365 Soakaway Tests. • Waste Classification and WAC testing for removal of waste to landfill. • Water Pipeline Risk Assessment.	

DESK STUDY WITH WALKOVER SURVEY FOR LAND ADJACENT TO 27-29 TARN DRIVE, BURY, BL9 9QB

CLIENT: SAEID TAPEH

1 INTRODUCTION

This report has been prepared in accordance with an email, dated 14th March 2026, from the Client.

The brief was set out in our estimate, ref. E8272 and dated 13th January 2026 and comprises a walkover survey and a desk study report including a historical, geological, mining and environmental appraisal together with a conceptual ground model.

We have previously issued a Geological and Mining Risk Assessment, report no. 8305 and dated December 2025, which should be read in conjunction with this report.

1.1 Site Location and Description

The site is located adjacent to 27 and 29 Tarn Drive, Bury, BL9 9QB, as indicated on Figure 1. The approximate National Grid Reference of the centre of the site is 380345E, 408975N.

As shown on Figure 2, the about 0.03 hectare almost rectangular shaped site is bounded to the north by Tarn Drive, to the east by Lakeland Crescent, to the south by an electricity substation, and to the west by 27 and 29 Tarn Drive (apartments). The site comprises a small grassed undeveloped open space.

1.2 Proposed Development and Purpose of the Desk Study

We understand that it is proposed to build a three floor detached residence with associated parking and gardens, as shown on Figure 3.

The Environment Agency's Land Contamination Risk Management guidance ^[1] sets out a three tiered approach to risk assessment:

1. Preliminary risk assessment: first tier of risk assessment that develops the initial conceptual site model to establish whether there are any potentially unacceptable risks.
2. Generic quantitative risk assessment: uses generic assessment criteria and assumptions to estimate risk.
3. Detailed quantitative risk assessment: uses detailed site-specific information to estimate risk.

Each tier should establish contaminant sources, assess the hazard using a source-pathway-receptor (S-P-R) linkage approach to find out if there is the potential for unacceptable risk, predict what degree of harm or pollution might result and how likely it is to occur, and evaluate the risk to determine whether the risk is unacceptable.

This desk study report comprises a Tier 1 risk assessment and has been conducted in general accordance with the Environment Agency's 'Land Contamination Risk Management' guidance ^[1] and British Standard BS10175: 2011+A2:2017 ^[2].



The purpose of the desk study is to:

- To review information regarding the sites historical, geological and environmental setting in order to develop a preliminary conceptual model and establish if there are any potentially unacceptable risks arising from contamination at the site.
- to evaluate the need for intrusive investigation.
- to support the discharge of relevant planning conditions and to meet the requirements of the Local Planning Authority (Bury Metropolitan Borough Council).

1.3 Walkover Survey

The walkover survey was undertaken on 17th March 2026. Surface features observed were recorded on a plan of the site together with the positions and directions of photographs taken. The resulting Walkover Survey Plan is shown in Figure 2 and site photographs are appended.

On the day of the walkover survey, the site could be accessed from either Tarn Drive along the north of the site, or Lakeland Crescent along the east of the site. The site was level and entirely grass surfaced, and two tree stumps were present in the south and centre (photos 1 to 3, 5 and 6). A live electricity substation was noted to be present along the southern site boundary, behind a short hedge (photos 3 and 4).

The site was bounded by a brick residence and wooden residential fencing with concrete supports to the west, and a brick built electricity substation to the south. The north and east site boundaries were openly accessible.

No visual or olfactory contamination was noted during the walkover survey.

1.4 Previous Investigations

1.4.1 Geological and Mining Risk Assessment Ref. 8305

A detailed Geological and Mining Risk Assessment was produced by Sub Surface Consultants Limited dated December 2025, ref. 8305, which comprised a geological and mining risk assessment with our conclusions and recommendations, which should be read in conjunction with this report.

The risk assessment found that the site was underlain by superficial deposits of an unknown thickness, beneath which was the Trencherbone Sandstone. A coal seam (Trencherbone Mine) is anticipated to underlie the site at approximately 10 metres below rockhead, which based on BGS records is expected to comprise 0.5m of coal underlain by 0.9m of fireclay. Due to the intact rock strata above the coal seam being less than ten times the thickness of the coal seam and fireclay, surface instability and settlement may arise should workings have taken place. As a result, we recommended that a minimum of two rotary boreholes are taken out to a depth of 30 metres followed by a ground stability assessment to determine the requirement of remedial measures for the proposed development.

2 DESK STUDY

2.1 Historical Appraisal

The past history of the site has been interpreted from the study of old Ordnance Survey plans supplied by GroundSure, as follows:

TABLE 1 SMALL SCALE SURVEYS

Date	Scale
1848-1851	1:10,560
1890-1891	1:10,560
1907-1908	1:10,560
1923-1928	1:10,560
1938	1:10,560
1955-1956	1:10,560
1965-1969	1:10,560
1974-1977	1:10,000
1980-1983	1:10,000
1988***	1:10,000
1991***	1:10,000
2001	1:10,000
2010	1:10,000
2015	1:10,000
2025	1:10,000

TABLE 2 LARGE SCALE SURVEYS

Date	Scale
1890	1:2,500
1891	1:500*
1910	1:2,500
1930	1:2,500
1937	1:2,500
1956-1957	1:1,250**
1957-1958	1:1,250**
1957-1958	1:2,500
1971	1:2,500
1970-1975	1:1,250**
1984-1985	1:1,250**
1989	1:1,250**
1987-1992	1:1,250**
1992-1995	1:1,250**
1995	1:1,250**
1995	1:1,250**
2003	1:1,250

* Appended extract reproduced at 1:1,000.

** Appended extract reproduced at 1:2,000.

*** Site not covered by survey

Extracts of the above surveys are appended.

TABLE 3 HISTORICAL APPRAISAL

Date	On site	Beyond site boundary
1848-51	Site is an undeveloped field.	The area within 250m is almost entirely undeveloped, with a road present 100m to the east (today Manchester Road, A56) and several residences present 60m northwest, 120m northeast, 90m east and 200m to the south. A workhouse is present 200m to the south.
1890	No significant change to site.	Spring present 20m to the northwest. A public house (Swan and Cemetery) is present 65m to the east. A timber yard and building material works are present 130m and 200m to the south respectively (likely the workhouse present by 1848-1851). A church has been built 170m to the east.
1910	No significant change to site.	The spring 20m to the northwest is not shown. A tramway is present on the now labelled Manchester Road 100m to the east.
1930	No significant change to site	Numerous residences have been built from 180m to the southeast and 220m to the east. A school is present 110m to the southeast and a tennis ground has been created 120m to the east. The timber yard 130m to the south is no longer present, and the building material works building has been expanded and is labelled a tannery with an associated sludge bed, reservoir and refuse heap 200m to the south. Unspecified earthworks noted 240m to the north.
1937	A tennis court has been built across the site.	Tarn Drive has been constructed adjacent to the north site boundary, and houses have been built from 20m to the northwest and 130m to the southeast. The tennis court 120m to the east is no longer present and an unspecified building has been built on the same area.
1956-57	The tennis court across the site is no longer present, however a playground is present in the east and centre of the site.	Earthworks are noted 10m to the east and 30m to the north. An unspecified building has been built adjacent to the western site boundary, alongside 43 to 61 Tarn Drive. The tramway along Manchester Road 100m to the east is no longer present. A garage has been built 140m to the south and the tannery 200m to the south is a Rubber Works, with the sludge bed and reservoir no longer present (likely infilled).
1965-69	No significant change to site.	Houses constructed from 120m to the southeast.
1970-74	No significant change to site.	The building adjacent to the west of the site is labelled 29 Tarn Drive. The earthworks 10m to the east are no longer present. Domestic garages built 100m to the west. The school 110m to the southeast is labelled a community centre.
1974-77	No significant change to site.	The residential buildings 200m to the northeast have been demolished and a new residential development has been built.
1984-85	The playground covering the site is no longer present.	An electricity substation has been built adjacent to the southern site boundary. Lakeland Crescent has been built adjacent to the eastern site boundary along with associated houses up to 170m to the south and 120m to the southwest. The garages 100m to the west have been demolished.
1989	No significant change to site.	Houses constructed between 120m and 230m to the southwest.

TABLE 3 (Cont'd) HISTORICAL APPRAISAL

Date	On site	Beyond site boundary
1995	No significant change to site.	Agricultural buildings 200m to the south have been demolished.
2003	No significant change to site.	No significant change to 250m.
2010	No significant change to site.	Unspecified works constructed 200m to the south and southwest.
2015	No significant change to site.	No significant change to 250m.
2025	No significant change to site.	The public house 65m to the east of the site is no longer labelled.

The small scale plans from 2001 to 2025 contain insufficient detail for review. However, aerial photographs from Google Earth™ indicate the industrial units 200m to the south were constructed by 2005. By 2018 an area 210m to the west was developed as a storage yard for a nearby industrial unit. In addition, trees can be seen in the centre and south of the site, with these being cut down by 2018. We are not aware of any other significant changes within the site and its immediate surrounding area.

2.2 Geological Appraisal

This following appraisal is based upon the appended Groundsure Enviro+Geo Insight Report (Sections 14 to 17).

2.2.1 Artificial Ground (Made Ground)

No Made Ground is indicated to be present within the site or in its immediate vicinity. However as the site has been developed some may be present.

2.2.2 Superficial Geology (Drift Deposits)

Drift deposits, described as River Terrace Deposits (sand and gravel), are indicated to be present within the site, the depth of which is unknown.

In addition, drift deposits, described as Devensian Till (Diamicton, poorly sorted gravelly sandy silty clay), are indicated to be about 21m to the northeast of the site boundary, the depth of which is unknown.

2.2.3 Bedrock Geology

Within the site the bedrock underlying the site is indicated to be the Trencherbone Rock (sandstone) of the Pennine Lower Coal Measures Formation.

In addition, about 37m to the northeast, the bedrock is indicated to be the Pennine Lower Coal Measures Formation (mudstone, siltstone and sandstone).

A coal seam is inferred to be present about 37m to the northeast. The dip and direction of dip of the rock strata, including the coal seam, is not given. Given the location of the coal seam in relation to the site boundary there is a possibility that it underlies the site at relatively shallow depth

Rock strata are also indicated to be displaced by geological faults about 182m to the northeast of the site boundary.

2.2.4 Potential Hazards in Natural Ground

The hazard rating from on-site running sands, collapsible deposits/ strata and landslides is very low while the hazard rating from shrinking/ swelling clays, compressible deposits/ strata and dissolution of soluble rocks is negligible.

2.3 **Mining, Radon, Soil Chemistry and Railway Infrastructure Appraisal**

This following appraisal is based upon the appended Groundsure Enviro+Geo Insight Report (Sections 18 to 21).

2.3.1 Mining and Ground Workings

Ordnance Survey mapping identifies surface excavations which may, or may not, have been subsequently backfilled with unknown material. The Ordnance Survey indicates that there are three historical surface excavations within 250m of the site boundary, the nearest being unspecified groundworkings about 20m to the north of the site boundary between 1928 and 1938.

The British Geological Survey maintain records of mining of minerals other than coal and indicates that there is no potential for non-coal mining beneath the site or within 1,000m of the site boundary.

The Coal Authority, and others, indicate that there is potential for coal mining beneath the site or within 1km of the site boundary. The appended Consultants Coal Mining Report, ref. 51003539440001 and dated 20th November 2025, indicates that they have no records of past underground mining beneath the site, but that there are probable unrecorded shallow workings.

The Coal Authority also indicates that there is no current mining or proposals to mine coal beneath the site. It should be noted that on 23rd December 2015 all underground coal mining ceased in the U.K.

Furthermore, there are no coal mine entries within 100m of the site boundary that the Coal Authority has knowledge of.

The Coal Authority Mining Report only refers to records in the possession of the Coal Authority. It should be noted that it did not become a statutory requirement to maintain and preserve plans of abandoned mines until the Mines (Coal) Regulations Act of 1872, by which date much unrecorded mining had taken place and of those plans which were made it is likely that not all will have survived.

A Geological and Mining Risk Assessment, report no. 8305 and dated December 2025, has been produced and should be read in accordance with this report.

According to the report the site is not in an area affected by significant non-coal mining, mining cavities, brine extraction, gypsum extraction, tin mining or clay mining.

2.3.2 Radon

The British Geological Survey and Public Health England have estimated the percentage of dwellings exceeding the “Radon Action Level” of 200 Becquerels/ m³ for the UK based on geological assessments and long term measurements of radon in more than 560,000 households.

The site is in a Radon Affected Area where between 1% and 3% of surrounding properties are above the Radon Action Level. Basic Radon protection measures are not required.

2.3.3 Soil Chemistry

The British Geological Survey have estimated likely background concentrations of potentially harmful arsenic, cadmium, chromium, lead and nickel in the topsoil. Data for on-site topsoil is given. In addition data for the land within 50m of the site boundary is given.

2.3.4 Railway Infrastructure

There are no active or inactive underground or overground railways and no railway tunnels within 250m of the site boundary.

The site is not within 250m of Crossrail 2 or the High Speed 2 (HS2) rail project.

2.4 **Environmental Appraisal**

This following appraisal is based upon the appended Groundsure Enviro+Geo Insight Report (Sections 1 to 13).

2.4.1 Historical Industrial Land Use

Historical potentially contaminative industrial land uses are recorded by the Ordnance Survey. Within 250m of the site boundary, there are fifteen potentially contaminative industrial land uses identified. Those that represent the most significant risk to the site are:

- Electricity substations, the nearest adjacent to the site from 1984 (present during the walkover survey).
- Unspecified ground workings 20m to the north between 1928 and 1938.
- Garages, the nearest 126m to the south between 1971 and 1987, and the most recent being 137m to the southeast between 1989 and 1995.
- Tanneries, the nearest and most recent being 156m to the south by 1955.
- An unspecified tank / tank 241m to the south between 1930 and 1937.
- A refuse heap 208m to the south by 1928.

2.4.2 Landfill

According to the Groundsure report there are no active or recently closed landfill sites within 250m of the site boundary.

Our historical appraisal has identified three unregistered landfills in the form of a pond and a reservoir infilled with unknown material and a refuse heap, which may be a source of ground gas, within 250m of the site boundary. The nearest is located 10m to the northwest and infilled by 1910, and the most recent is 200m to the south and infilled by 1956-1957. Due to the age of the nearest infilling, and the size of each, it is unlikely that the refuse heap being 208m to the south by 1928 will significantly affect the site.

2.4.3 Waste

Local Authority records and detailed Ordnance Surveys indicate no waste sites within 250m of the site.

According to the Environment Agency there are no active or recently closed waste sites within 250m of the site boundary.

The Environment Agency have four records of activities involving the storage, treatment, use or disposal of wastes that are exempt from needing a permit (within specific limits and conditions) within 250m of the site boundary, with all four records relating to a works site 189m to the south of the site boundary.

2.4.4 Current Industrial Land Use

Current potentially contaminative industrial land uses are recorded by the Ordnance Survey and Experian. Within 250m of the site boundary, there are nine potentially contaminative industrial land uses. Those that represent the most significant risk to the site are:

- An electricity substation 2m to the south.
- Vehicle repair, testing and servicing works, the nearest being 147m to the southeast.
- A closed petrol station 225m to the southeast.

2.4.5 Sites Determined as Contaminated Land

There are no sites determined as contaminated under Section 78R of the Environmental Protection Act (1990) within 250m of the site boundary.

2.4.6 Control of Major Accident Hazards (COMAH)

Records of Control of Major Accident Hazards (COMAH), including Notification of Installations Handling Hazardous Substances (NIHHS) and other historical data, indicate that there are no dangerous or hazardous sites within 250m of the site boundary.

2.4.7 Regulated Explosives Sites

Up to April 2015 there were no sites within 250m of the site boundary registered and licensed by the Health and Safety Executive under the 2005 Manufacture and Storage of Explosives Regulations.

2.4.8 Hazardous Substance Storage and Usage

There are no Local Authority records of consents granted for sites to hold certain quantities of hazardous substances at or above defined limits in accordance with the 2015 Planning (Hazardous Substances) Regulations within 250m of the site boundary.

2.4.9 Historical Licenced Industrial Activities (IPC)

There are no historical Integrated Pollution Control (IPC) records of substances released to the air, land and water according to the Environment Agency within 250m of the site boundary.

2.4.10 Licenced Industrial Activities (Part A(1))

The Environment Agency indicate that there are no records of Part A(1) installations regulated under the 2016 Environmental Permitting (England and Wales) Regulations for release to the environment within 250m of the site boundary.

2.4.11 Part A(2) and Part B Authorisations

Local Authority records indicate there are no Part A(2) and two Part B installations regulated under the 2016 Environmental Permitting (England and Wales) Regulations for the release of substances to the environment within 250m of the site boundary, the nearest being about 187m to the south of the site boundary.

2.4.12 Radioactive Substance Authorisations

The Environment Agency indicate that there are no records of storage, use, accumulation and disposal of radioactive substances regulated under the 1993 Radioactive Substances Act within 250m of the site boundary.

2.4.13 Licensed Discharges to Controlled Waters

According to Environment Agency records there have been no discharges of treated or untreated effluent to controlled water under the 1991 Water Resources Act within 250m of the site boundary.

2.4.14 Pollutant Release to Surface Waters (Red List)

The Environment Agency records indicate that there have been no discharges of specified substances under the 1991 Environmental Protection (Prescribed Processes and Substances) Regulations within 250m of the site boundary.

2.4.15 Pollutant Release to Public Sewers

According to Environment Agency records there have been no discharges of special category effluents to public sewers within 250m of the site boundary.

2.4.16 List I and List II Dangerous Substances

The Environment Agency records indicate that there have been no discharges of substances on List I or List II of the European Directive E2006/11/EC, regulated under the 2015 Environmental Damage (Prevention and Remediation) Regulations, within 250m of the site boundary.

2.4.17 Pollution Incidents

According to the Environment Agency there are no records of substantiated pollution incidents within 250m of the site boundary.

2.4.18 Pollution Inventory Substances

The Environment Agency indicate that there have been no reports on annual emissions of certain regulated substances to air, controlled waters and land within 250m of the site boundary.

2.4.19 Pollution Inventory Waste Transfers

According to the Environment Agency there have been no reports on annual transfers and recovery/ disposal of controlled wastes within 250m of the site boundary.

2.4.20 Pollution Inventory Radioactive Waste

The Environment Agency indicate that there have been no reports on annual releases of radioactive substances within 250m of the site boundary.

2.4.21 Hydrogeology

The following designation of aquifers is in accordance with the Environment Agency's April 2010 Groundwater Protection Policy.

Superficial/ drift deposits are anticipated to be present and comprise River Terrace Deposits (sand and gravel) which are indicated to be a Secondary A aquifer.

The bedrock is anticipated to be the Trencherbone Rock (sandstone) which is indicated to be a Secondary A aquifer comprising permeable layers capable of supporting water supplies at a local scale and in some cases forming an important source of base flow to rivers.

The vulnerability of groundwater to a pollutant found within the site and its immediate surrounding area has been assessed as "Low", an area able to provide protection from pollution.

British Geological Survey and Environment Agency data indicates that the site is not within a 1km grid where solution features are present that will enable rapid movement of a pollutant to groundwater.

Environment Agency data indicates that the site is not in an area where additional local information indicates that groundwater is vulnerable to pollution.

According to data provided by the Environment Agency there are sixteen groundwater abstraction licences (nearest historical 153m southeast, nearest active 1,430m southeast), twenty four surface water abstraction licences (nearest historical 427m southwest, nearest active 728m west), and two potable water abstraction licences (nearest historical 1,359m east) within 2000 m of the site boundary.

There are no Source Protection Zones, set up to protect a water source within 250m of the site of boundary, present according to the environmental data report.

2.4.22 Hydrology

The Ordnance Survey indicate that there are no watercourses (river, stream or canal) within 250m of the site boundary.

There are no surface water features (ponds or lakes) within 250m of the site boundary according to the Ordnance Survey.

Environment Agency data relating to the Water Framework Directive (WFD) indicates that the site is within the catchment of the Irwell (Rossendale STW to Roch), this watercourse being about 311m to the west of the site boundary and the groundwater body is known as the Northern Manchester Carboniferous Aquifers.

2.4.23 Flooding

Flooding data is maintained by the Environment Agency. The Risk of Flooding from Rivers and Sea (RoFRaS) database indicates that within 50 m of the site boundary the highest risk of flooding is “Low”.

In the period since records began in 1946, there is one record of a historical flood within 250m of the site boundary. This record is 247m to the southwest and is from 26th December 2015, caused by the river channel capacity being exceeded.

There are no flood defences, areas benefitting from flood defences or flood storage areas present within 250m of the site boundary.

The site boundary is within a Flood Zone 2 and is not within 50m of Flood Zone 3.

According to Ambiantal Risk Analytics surface water “FloodMap” there is a 1 in 30 year (0.1m – 0.3m) risk of flooding on the site and a 1 in 30 year (0.3m – 1.0m) risk of flooding within 50 m of the site boundary.

Groundwater flooding is caused when the water table rises in areas where this is usually at shallow depth. Ambiantal Risk Analytics indicate that there is a moderate risk of groundwater flooding on the site and within 50 m of the site boundary.

Given the above we anticipate that a Flood Risk Assessment will be required.

2.4.24 Environmental Designations

Natural England, Natural Resources Wales and Scottish Natural Heritage indicate that there are environmental sensitive sites within 2000 m of the site boundary.

Two Local Nature Reserves (LNR) (nearest 1,161m east), four Green Belt Land (nearest 871m south) and one Sites of Special Scientific Interest (SSSI) Impact Risk Zone (on site) are present.

2.4.25 Visual and Cultural Designations

Historic England indicate that within 250m of the site boundary there is two Listed Buildings and no World Heritage Sites, Areas of Outstanding Natural Beauty, National Parks, Conservation Areas, Scheduled Ancient Monuments or Registered Parks and Gardens.

2.4.26 Agricultural Designations

Natural England indicate that the Agricultural Land (quality) Classification for the site and the land within 250m of the site is Urban.

Natural England indicate that there is no open access land within 250m of the site boundary.

The Forestry Commission indicate that there are no tree felling licences within 250m of the site boundary.

Natural England indicate that there are no environmental stewardship schemes within 250m of the site boundary.

Natural England indicate that there are no countryside stewardship schemes within 250m of the site boundary.

2.4.27 Habitat Designations

Natural England indicate that there are five priority habitats (nearest 22m east), and no habitat networks, open mosaic habitats or limestone pavement orders within 250m of the site boundary.

2.5 Conceptual Ground Model

A conceptual ground model of a site and its environs uses available information to form a preliminary assessment of contamination sources, pathways and receptors, and the significance of hazards that exist or will potentially exist on the site. Its purpose is to identify the relationships between sources of contamination, pathways and receptors to allow exposure scenarios to be determined and thereby aid in the design of any intrusive investigation. It also forms the basis of the risk assessment.

2.5.1 Sources

Potential sources of contamination identified in the desk study are:

- General contaminants associated with Made Ground (if present) and past and present contaminative processes undertaken on and adjacent to the site including construction of buildings adjacent to the site and the development of a tennis court and a playground previously on site.
- Migrating leachate (contaminated surface and/ or groundwater) from any Made Ground present on site.
- Migrating ground gases from an unregistered landfill 200m to the south and infilled by 1956-1957, and a refuse heap 208m to the south by 1928.
- PCBs from the electricity substation adjacent to the southern site boundary.
- Accumulated ground gases in on-site confined spaces.

2.5.2 Pathways

Potential pathways from source and receptor for the proposed development are:

- Direct skin contact with and/ or ingestion of contaminated soils and/ or water.
- Inhalation of dust, vapours and/ or gases.
- Dissolved contaminants via infiltrating surface water/ migrating groundwater.
- Dissolved ground gases via infiltrating surface water/ migrating groundwater.
- Migrating contaminants to the underlying aquifer and to adjacent properties.
- Volatile contaminants via permeable soils and rocks.
- Ground gases via permeable soils and rocks.
- Consumption of contaminated fruit and/ or vegetables.

2.5.3 Receptors

Potential receptors for the proposed development are:

- Site operatives during demolition, earthworks and/ or construction.
- The end users of the development (young children are the most sensitive).
- Fruit and vegetables grown in gardens for consumption.
- Vegetation, bushes and trees planted as part of the development of the site.
- Adjacent properties and occupants.
- Controlled waters including surface water and groundwater, including aquifers.
- Maintenance operatives entering on-site confined spaces after development.

2.5.4 Conclusions

An appraisal of the sources, pathways and receptors has been considered and we have produced a conceptual ground model based upon the available information, as follows:

TABLE 4 CONCEPTUAL GROUND MODEL

Potential Source	Nature of Hazard	Contaminants Associated with the Source	Pathway	Receptor	Preliminary Risk Rating
Made Ground (if present)	Contaminants in Made Ground	<u>Gen. Contaminants</u> Arsenic Cadmium Chromium Lead Mercury Molybdenum Nickel Selenium Boron Copper Zinc Cyanide Sulphide Sulphate pH Phenols Polynuclear Aromatic Hydrocarbons (PAH) Total Petroleum Hydrocarbons (TPH)	Ingestion of soil	Site Operatives	Very Low
			Ingestion of dust	End Users	
			Ingestion of contaminated vegetable produce		
			Dermal contact		
			Inhalation of dust		
			Inhalation of vapours		
			Uptake via contaminated groundwater	Vegetation	Very Low
			Vertical and lateral movement of mobile contaminants to surface water and groundwater	Controlled Waters	Very Low
			Direct contact	Structures and Services	Very Low
Asbestos on/ in ground	Asbestos fibres	Asbestos fibres	Inhalation of fibres	Site Operatives End Users	Very Low
Electricity Sub Station	Spillage/ leakage of transformer coolants	Poly Chlorinated Biphenyls (PCB)	Ingestion of soil	Site Operatives	Moderate
			Ingestion of dust	End Users	
			Ingestion of contaminated vegetable produce		
			Dermal contact		
			Inhalation of dust		
			Inhalation of vapours		
			Uptake via contaminated groundwater	Vegetation	Moderate
			Vertical and lateral movement of mobile contaminants to surface water and groundwater	Controlled Waters	Low
			Direct contact	Structures and Services	Moderate

8305A – Land adjacent to 27-29 Tarn Drive

TABLE 4 (Cont'd) CONCEPTUAL GROUND MODEL

Potential Source	Nature of Hazard	Contaminants Associated with the Source	Pathway	Receptor	Preliminary Risk Rating
Landfill (unregistered)	Ground Gas (Asphyxiation, fire and explosion)	Methane Carbon Dioxide	Inhalation of gas Ignition of gas	Site Operatives End Users	Very Low
Mining (1)	Ground Gas (Asphyxiation, fire and explosion)	Methane Carbon Dioxide	Inhalation of gas Ignition of gas	Site Operatives End Users	Moderate
Mining (2)	Subsidence	-	-	Structures and services	Moderate

The conceptual ground model indicates that a nominal intrusive ground investigation is required to assess the ground conditions and obtain samples for PCB testing adjacent to the electricity substation. In addition, if a significant thickness of Made Ground is found to be present soil samples should be obtained for contamination analysis and asbestos detection and, where possible, groundwater and surface water samples for contamination analysis.

In addition, the conceptual ground model indicates that ground gas monitoring is not required unless a significant thickness of Made Ground is encountered in site. If substantial Made Ground is present gas standpipes should be installed and monitored over an extended period of time to allow for an assessment to be made.

As stated in the Geological and Mining Risk Assessment dated December 2025, ref. 8305, we recommend that a minimum of two rotary boreholes are taken out to 30m depth followed by a ground stability assessment in order to determine whether remedial measures are required for the proposed development. Also where mineworkings are found at shallow depth there is a potential for accumulated mine gas migrating to the surface or near surface level. Given this scenario consideration should be given to installing standpipes and undertaking ground gas monitoring followed by a ground gas risk assessment.

3 GENERAL

It should be noted that when developing a “brownfield site” a phased investigation should be undertaken in order that each phase informs the next. A typical phased investigation comprises the following:

- Phase I: desk study report (Tier 1 risk assessment)
- Phase II: ground investigation (Tier 2 or 3 risk assessment) with report
- Phase III: options appraisal and remediation statement report
- Phase IV: validation report.

In the preparation of this report no consideration has been given to flora and fauna as this was outside our brief.

We recommend that consultation should be undertaken with, and the written approval obtained from, the Local Authority Environmental Health Officer, the Local Authority Building Control Officer and the Coal Authority prior to commencing development.

We trust that this report fulfils your present requirements but if you have any queries or we can be of further assistance please contact the undersigned or Mr Ben Osborne at our Preston office.

SUB SURFACE CONSULTANTS LIMITED
REPORT No. 8305A
APRIL 2026

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4 REFERENCES

- [1] Environment Agency, "Land Contamination Risk Management," Environment Agency, 2025.
- [2] British Standards Institution (BSI), "BS 10175: 2011+A2:2017 Investigation of potentially contaminated sites. Code of practice - Code of practice," 2011.

PRELIMINARY RISK RATING GUIDANCE

PRELIMINARY RISK RATING GUIDANCE

The following table based on CIRIA C552 'Contaminated Land Risk Assessment. A Guide to Good Practice' has been used when developing the Conceptual Ground Model and the preliminary risk ratings. The method requires an assessment of the magnitude of the probability or likelihood of the risk occurring and the magnitude of the potential consequence or severity of the risk occurring to formulate a preliminary risk rating (Table A).

Table A DESCRIPTION OF RISK AND LIKELY ACTION REQUIRED

Preliminary Risk Rating	Action Required
Very High Risk	Extensive Ground Investigation Required. 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 undertaken already) and remediation are likely to be required.
High Risk	Extensive Ground Investigation Required. 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	Ground Investigation Required. 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 long-term.
Low Risk	Nominal Ground Investigation Required. 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	No Ground Investigation Required.* 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.
Negligible Risk	No Ground Investigation Required.* There is a very low possibility that harm could arise to a receptor. In the event of such harm being realised it is not likely to be severe.

* No further action is required unless unforeseen contaminated ground conditions are encountered.

PHOTOGRAPHS