



PRELIMINARY RISK ASSESSMENT REPORT FOR HOPWOOD HALL COLLEGE, ROCHDALE

TE1880-TE-00-XX-RP-GE-001-V03

12 MARCH 2025

FINAL

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EXECUTIVE SUMMARY

Introduction	Tier Environmental was commissioned by Wilmott Dixon Construction Ltd to undertake a desk study and Phase I Preliminary Risk Assessment of the proposed educational development at Hopwood Hall College, Rochdale. The purpose of this investigation was to establish land use history and review the available information to determine the geoenvironmental setting of the site and develop a preliminary conceptual site model with due consideration of potential soil and groundwater contamination, hazardous ground gases and mining.
Proposed land use	It is proposed that the site will be developed with a new educational building. Areas of proposed soft landscaping are located in the northwest, northeast and southeast parts of the site.
Site location and surrounding land uses	The site is located at Hopwood Hall College, Rochdale Campus, St Mary's Gate, Rochdale OL12 6RY. The site is set within a mixed commercial and residential area, with Rochdale Town centre located approximately 500m northeast of the site.
Site history	Historically the River Roch meandered through the centre of the site, with a weir present close to the centre west of the site. Excavation/building up/stockpiling of materials is shown on its northwestern bank at several points in history. The remainder of the site has historically been occupied by a large mill (including a pump) in the east of the site, and several smaller mills and dyeworks (including a tank) in the west of the site at extending offsite beyond the site boundaries. Holland Street and presumed residential properties (which may have contained basements) were mapped in the northeastern corner of the site. By the 1960s the mill in the east of the site had been replaced with Rochdale Technical College, although some of the smaller mills/works were still shown in the northwest of the site at this time, alongside allotment gardens. By the late 1960s/early 1970s the River Roch had been diverted along the southern boundary of the site, with the former watercourse on site infilled. Embankments are shown along the watercourse at the southern site boundary, suggesting site levels may have been raised. Allotments and buildings in the northwest of the site were demolished during this time, with a large building labelled as Rochdale College now present across the majority of the west and centre of the site, and additional college buildings shown in the southeast of the site and an access road and car park created in the northwestern corner of the site. Holland Street was rerouted to the north of the site and renamed as Bury Street and later College Road, with the buildings alongside it demolished. The large college building in the west and centre of the site is last shown in 2008, by 2012 this and the smaller buildings in the southeast of the site have been demolished. The west/centre of the site was resurfaced for car parking (it is understood the concrete floor slab was left in situ beneath the asphalt) and the southeastern area was soft landscaped. The immediate surrounding area predominantly comprised industrial/commercial land uses including mills and dyeworks, a cattle market, warehouses, unnamed works, with some terraced residential properties. The majority of the surrounding industry was demolished by the 1960s to 1980s, with an embankment and high rise residential constructed from 10m to the north of the site (potentially on built up land) and possible raising of levels shown in the former cattle market area approx. 20m east of the site during the 1970s. By 2000, the former cricket ground and industry to the south of the river was replaced with a supermarket and associated petrol station.
Geology, hydrogeology and hydrology	Made Ground has been recorded to depths of between 0.95m and 6.80m bgl (the deeper Made Ground being recorded within the former infilled watercourse) within a previous third party ground investigation. Superficial Deposits comprising Alluvium (Secondary A aquifer) are recorded in the north of the site, with Glaciofluvial deposits (Secondary A aquifer) recorded across the remainder of the site. The solid geology is recorded as the Pennine Lower Coal Measures (Secondary A aquifer). There are no Source Protection Zones, potable, non-potable or surface water abstractions recorded within 250m of the site. The nearest surface water feature is the River Roch located beyond the southern site boundary, with the River Spodden also located 209m southwest of the site. No further surface water features are located within 250m of the site. Groundwater flow is anticipated to be towards the southwest based on surrounding topography and the presence of the River Roch. There is understood to be limited surface water drainage in the form of ACO drains at the main car park perimeters, with an interceptor located in the northeast of the car park. The controlled waters sensitivity is regarded as being moderate/high.
Ground gases	Potential ground gas sources include: • Alluvium and infilled watercourse on site, both of which may contain organic rich materials; • Significant depth of Made Ground on site and likely within the immediate vicinity of the site; • Potential mine workings beneath the site and surrounding area; • Previously recorded localised hydrocarbon impacted materials in the northeast of the site; • Potentially infilled features within the surrounding 250m of the site, including a landfill located approximately 200m west of the site (for which there are no details of waste input, other than that it was backfilled pre-1974 Control of Pollution Act). Previous third party ground gas monitoring (for which there is no reliance) concluded that no ground gas protection measures are required for any proposed structures.



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Radon requirements	Basic radon protection measures are not currently required for the proposed development on this site (which is understood not to include a basement).
Ecological sensitivity	The site does not lie within an ecologically sensitive area.
Potential contaminative features	Potential contaminative features and sources identified include: - Widespread Made Ground across the site, extending to a significant depth within the route of the former watercourse. Made Ground was recorded to contain asbestos (at a concentration of 0.003%w/w including chrysotile fibres and amosite loose fibrous debris) within the previous third party investigation. - Former historical land uses across the site including mills, dyeworks, other unspecified works, a weir and a former watercourse - The current college building in the east of the site includes 2 no. oil tanks, both of which are understood (anecdotally from the college estates management during the site walkover) to no longer be used with one understood to have been emptied via tanker (but not decommissioned) in the past couple of years. These oil tanks are present within a separate concrete bunded room, only accessible via locked ladder access. From the limited viewpoint accessible during the walkover, no spills or leakages were observed - Current car park located across the majority of the site. An interceptor is present in the northeast of the main car park area. - An electric substation is present in the northeast of the site - A historical landfill is located 204m W, with no information on the waste accepted or any dates of operation given, although the Environment Agency have stated that it was infilled before 'controls imposed under the Control of Pollution Act 1974'. Numerous other infilled features are located within the surrounding 250m of the site.
Mining and quarrying	The Coal Mining Risk Assessment should be referred to for further details of the risk of coal mining to the site. There is evidence of other extractive industries within 250m of the site. Further ground investigation should be targeted to investigate the risk to the site from mining and quarrying both on site and within the surrounding area.
Previous investigations	A previous third party ground investigation has been undertaken for the site. However it is understood that reliance on these reports cannot be assumed, and therefore these reports have been referred to for information purposes only.
Unexploded ordnance	The anticipated UXO risk is low, with no further works required.
Other issues	There is an easement zone surrounding the sewer which runs through the current access and delivery road in the east of the site (to the west of the existing building and east of the proposed building). Other below ground services are also present across the site.
Waste soils classification	Based on the history of the site and the anticipated potential contaminants of concern it is considered possible that hazardous waste soil materials may be present beneath some areas of the site; however, this will be subject to confirmatory investigation, sampling, laboratory analysis and waste classification in accordance with the Guidance on the Classification and Assessment of Waste (WM3).
Materials re-use	Subject to volumetric fill requirements and a future assessment of suitability of re-use (both chemically and geotechnically), some materials may be considered for potential re-use in line with an appropriate end-of-waste protocol such as WRAP Quality Protocol for Aggregates from Inert Waste, U1 Exemption or a Materials Management Plan in accordance with the CL:AIRE Definition of Waste Code of Practice (DoWCoP). Please note that any previously landfilled or mining waste materials may not be appropriately subject to consideration under DoWCoP and may not be re-used under DoWCoP unless sufficient lines of evidence and agreement with the local Environment Agency Waste Team can be sought beforehand. In addition, Section 4.10 of this report includes statements with respect to re-use of excavated and stockpiled clean naturally occurring soils within the site and re-use on other sites. These statements are designed to provide a clear intention to reuse any clean, naturally occurring soils derived from future excavations at this site (which may also include temporary future stockpiling these materials).
Further works	Further proposed works include; - Trial pitting within 1 no. soft landscaped area to investigate shallow ground conditions and enable the performance of soak away testing, and falling head testing within boreholes elsewhere on site to enable infiltration testing. - Window sample drilling and installation of shallow monitoring wells for gas and groundwater (if encountered) monitoring purposes and to facilitate soil sampling for environmental and geotechnical testing. - In situ geotechnical testing to assist with foundation design and recommendations; - Geoenvironmental chemical testing on selected soil samples for metals, pH, speciated PAH, speciated TPH, phenol, SVOC/SVOC, PCBs, glycol, sulphate, TOC and asbestos screens in order to assess potential



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	risks to human health based on historical land uses on and within close proximity to the site and to assist with basic waste characterisation. • Geoenvironmental chemical testing on selected asphalt samples to assess the potential risk to human health from coal tar potentially present within the exiting asphalt surfacing across site. • The Control of Asbestos Regulations 2012 should be adhered to. A summary of complying with CAR: risk assessments, licensing and training is provided in Appendix G.
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1. INTRODUCTION

Tier Environmental was commissioned by Wilmott Dixon Construction Ltd to undertake a Land Contamination Risk Management (LCRM) Preliminary Risk Assessment for an area of land referred to as Hopwood Hall College, located at Hopwood Hall College, Rochdale Campus, St Mary's Gate, Rochdale OL12 6RY (the "site").

The full title of this report, a '*Stage 1 - LCRM Tier 1 Preliminary Risk Assessment Report*', is in accordance with that described in the Land Contamination Risk Management guidance (available at <https://www.gov.uk/government/publications/land-contamination-risk-management-lcrm>) which has superseded CLR 11.

1.1. Proposed Development

Under current proposals the development will comprise the partial demolition of the existing college buildings in the east of the site, with construction of the new posed college building in the north, a water tank and small ancillary building in the centre, and a substation in the northwest of the site. The remainder of the site will comprise car parking and soft landscaped areas, as presented in Appendix A. As such, in accordance with the '*Updated technical background to the CLEA model*' (Environment Agency, 2009) and '*Suitable 4 Use Levels*' (LQM / CIEH 2015) the proposed generic land use for this development is commercial, which is deemed to be the most appropriate due to the activities that are likely to be undertaken on site (educational) and the limited frequency and duration of time end users are likely to spend on site. In the event that any areas are locally used for edible vegetable / plant growth, then these areas may need to be considered separately with respect to future risk assessments.

1.2. Previous Reports

Tier Environmental have been provided with the previous third party reports for the site and which have been reviewed; however, it is understood that reliance on these reports cannot be assumed:

- Geotechnics Ltd – 'Geoenvironmental and Geotechnical Desk Study Report' (Report reference: PC218240, dated 30th July 2021);
- Geotechnics Ltd – 'Preliminary Ground Investigation Report with Interpretative Chapter' (Report reference PN214280, dated November 2021).

1.3. Objectives

Taking into account the proposed development of the site, the objectives of this appraisal were:

- To determine the historical and current land use.
- To establish the environmental setting of the site.
- To evaluate whether past mining or other extractive industries could have an influence on the site.
- To review previous pertinent third party reports;
- To determine likely ground and groundwater conditions.
- To determine the potential risks to human health and the wider environment.
- To determine potential risks posed to the site from hazardous ground gases and / or vapours.
- To derive a Preliminary Conceptual Site Model.



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1.4. Assumptions

The following assumptions are made in this report:

- It is assumed that ground levels will not change significantly from those described in this report or as shown on proposed development drawings. If this is not the case, then amendments to the recommendations made in this report may be required.
- Any references to observations of suspected asbestos-containing materials are for information only and should be verified by a suitably qualified asbestos specialist and/or confirmed by laboratory analysis.
- The use of the term 'Topsoil' within this report is based on a visual identification only and that these materials have not been classified in accordance with BS3882:2015.
- The use of the terms 'shallow' and 'deep' within this report (from a geotechnical perspective) assume *typically* between ground level to circa 3.00m below ground level (bgl) for 'shallow' and greater than 3.00m bgl regarded as 'deep';
- The comments and opinions presented in this report are based on the findings of the desk study, a review of third party information, and a review of ground conditions encountered during previous third party intrusive investigation works. There may be other conditions prevailing on the site which have not been revealed by this investigation and which have not been taken into account by this report at this stage.
- Responsibility cannot be accepted for any conditions not revealed by this investigation. Any diagram or opinion on the possible configuration of the findings is conjectural and given for guidance only. Confirmation of ground conditions should be undertaken if deemed necessary.

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2. SITE DETAILS AND DESCRIPTION

Table 2.1 Current Site Overview.

Site name	Hopwood Hall College
Site address	Hopwood Hall College, Rochdale Campus, St Mary's Gate, Rochdale OL12 6RY. A site location plan is included as Drawing No. TE1880-TE-00-XX-DR-GE-001-V01 within Appendix A.
National Grid Reference (NGR)	389299, 413363
Approximate site area	1.75 ha
Site shape	The site is approximately triangular in shape with a curved southwestern boundary.
Current land use on the site	The site currently comprises a college with a building of several storeys (including a basement/undercroft) present in the east of the site, and an asphalt surfaced car park across the majority of the remainder of the site and a drop off lane present along the northern and western boundaries. It is understood that an interceptor is present in the northeastern corner of the car park/drop off lane. Metal fencing around 2m height is present at the northern and western extent of the car park, with a brick retaining wall of between approximately 1m and 2m height present at the northern boundary of the drop off lane, marking the site boundary with College Road. A second brick retaining wall is present at the south of the car park, separating the car park from the river embankment which lies approx. 1m to 2m below the car park. No cracks or visible signs of stress were visible on either of the retaining walls. Limited soft landscaped areas are present, including a small, sloped grass verge in the northwest of the site, a grassed embankment between the car park/college buildings and the river in the south of the site, and as a grassed terraced area to the north east of the building, which steps down to the basement floor level. The basement/undercroft area is accessible from the car park and is understood to comprise storage, waste disposal areas (bins/skips) and a plant room. The plant room contains the heating infrastructure for the building, including 2 no. oil tanks, both of which are understood (anecdotally from the college estates management during the site walkover) to no longer be used with one understood to have been emptied via tanker (but not decommissioned) in the past couple of years. These oil tanks are present within a separate concrete bunded room, only accessible via locked ladder access. From the limited viewpoint accessible during the walkover, no spills or leakages were observed. An electric substation is present in the northeast of the site, to the northwest of the existing college building. Underground services are known to be present beneath the site, including electricity, gas, water and drainage. There is limited surface water drainage around the car park area, observed only to be present at the car park boundaries. Vehicular access for deliveries and disabled parking is present from College Road close to the centre north of the site, leading to the drop off lane, a small parking area and the basement/undercroft access. An access road for the main car park is present in the northwest of the site, with a smaller car park present to the west of this access road. This smaller car park is understood to be let out and was not accessible during the ground investigation. During college opening hours, pedestrian access is freely available. A hedge of approximately 1m height is present surrounding the northeastern soft landscaped area, with limited shrubs present elsewhere around site. Mature trees are present in the far northwest of the site, surrounding the smaller car park (it is understood to development is to be undertaken in this area). It should be noted that the car park in the northwest of the site and the terraced soft landscaping in the east of the site were not accessible during the walkover, with the terraced soft landscaping unlikely to be accessible for any ground investigation in their present condition.
Surrounding land uses	The site is set within a mixed commercial and residential area, with Rochdale Town centre located approximately 500m northeast of the site.
General topography and ground levels	The main car park area of the site is generally level at around 119m AOD. However, College Road to the north of the site lies between approx. the same level as the site in the northeast (120m AOD) rising to around 1.0m higher than the site in the northwest (120m AOD), separated from the site by a brick retaining wall. Similarly, in the south of the site the highest level of the grassed banks of the River Roch lies between 0.5m to 1.0m below the car park level at around 118m AOD, separated by a brick retaining wall. Site levels between the existing building and St. Mary's Gate also vary, with grassed terraces leading from road level (120m AOD) in the northeast to 116m AOD in the centre east and back up to 120m AOD in the southeast. Again, a brick and concrete retaining wall was present at the site boundary (this area was not accessible during the walkover).



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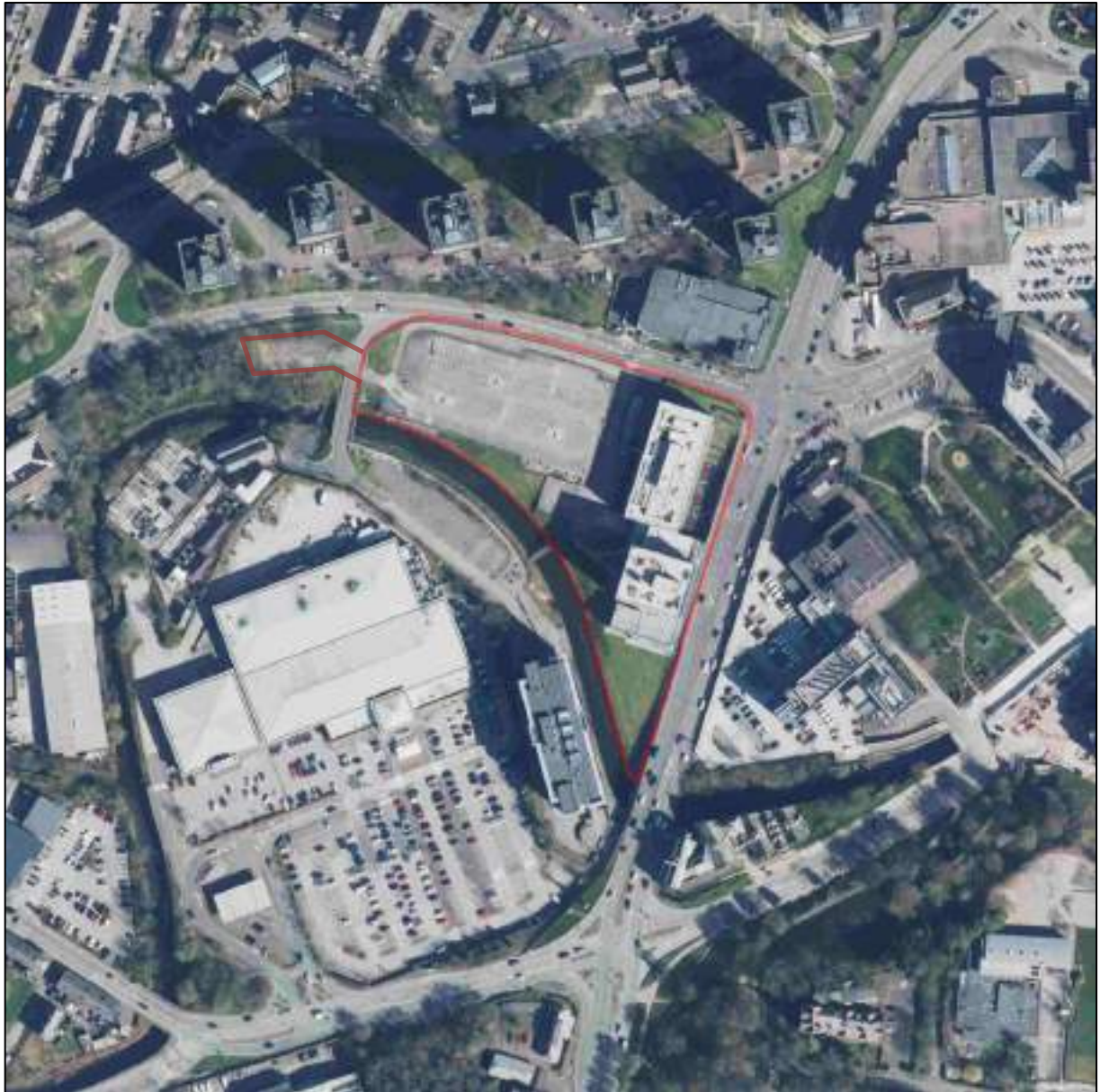
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An aerial photograph (from the Groundsure report) of the site and site boundary is shown below.

Figure 2.1 Recent Aerial Photograph from Groundsure





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3. SITE HISTORY

3.1. Site History Review

Extracts of Ordnance Survey (OS) plans dated from 1851 to 2024 were reviewed. These were obtained as part of the Groundsure report for the site, which is presented in Appendix B. In addition, historic aerial photography on Google Earth has been reviewed.

Table 3.1 below presents a summary of the main aspects of the site relevant to the current and proposed future end uses. It is not the intention of this report to describe in detail all of the changes that have occurred on or adjacent to the site, where these are not relevant to the land use.



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Table 3.1 Site History.

Time Period	On-site features	Off-site features
Pre-1900	 1851 - Holland Street Mill (cotton) is present in the northeast of the site, inclusive of a pump, and extending into the southeast of the site during the 1890s. Town Mill (fulling) and dye works are present in the northwest, with tank shown in the southwest of the site by 1890. A second dye works is shown immediately adjacent to the northwestern boundary (which whilst not within the planning boundary, is understood to form a wider part of the site ownership). - Holland Street and the (presumed) residential properties lining it to the north encroaches into the northeastern corner of the site, trending approx. NW to E, and into the northwest of the site trending approx. north to southwest	- A mixture of presumed residential and industrial properties are present within the immediate vicinity of the site, including a boiler house, tanks, weighing machines and cess pool to the north, dye works extending off to the northwest, Sunny Bank Mill (woollen and cotton) and Bankside Mill (cotton) to the south. Rochdale Cricket ground is labelled to the south of these. - Numerous mills (predominantly cotton) are present within the close surrounding vicinity of the site, with a cattle market present approx. 20m east of the site. - Manchester New Road is present immediately beyond the eastern boundary, with (presumed) residential properties and parks present further east.



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Time Period	On-site features	Off-site features
	- The River Roch meanders through the centre of the site, entering along the southern boundary, flowing to the north before exiting the site at the southwestern boundary. Various bridges, weirs and fords crossing its route on site. - A wooded area is present to the south of the river in the centre of the site, and possible gardens are present the north. A Sunday school and buildings assumed to be associated with the mills are constructed over these areas by 1890. - Two small areas of excavation or stockpiled materials are shown on the northwestern banks of the River Roch in the northwest of the site	- A significant number of embankments within an area of parkland are shown from approx. 200m south and southeast of the site, labelled as Park Slopes. - A gas works is shown around 300m southwest of the site. - A quarry is labelled from around 350m west of the site. Several further quarries and brickfields are shown in the wider surrounding area from between 500m and 750m from the site. Pinfold Colliery and Sparth Bottoms Colliery are shown around 700m and 800m southwest respectively, shown as mills by 1908-1909.
1900 to 1939 (Pre-war period)	 1930	
	No significant change	No significant change



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Time Period	On-site features	Off-site features
1939 – 1945 (World War II period)	No maps available	
1945-1960 (Post war period)	1959 • The mill in the east of the site has been demolished, replaced with 2 No. new buildings in the northeast labelled as a technical college. No development is shown in the southeast. • The dye works in the north has been demolished, with an excavation and stockpile shown in this area. Allotment gardens are shown in the northwestern corner. One smaller mill to the north and one smaller mill and a works building to the south of the river remain in the centre of the site. • The former mill buildings and residential properties to the north have been demolished. Further allotment gardens are shown to the northwest. • The cattle market approx. 20m east of the site has been demolished, with the area renamed The Holme (and later a car park). The buildings to the north of this are now labelled as a ruin and a builders yard. • An ironworks is labelled approx. 250m southwest of the site	



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Time Period	On-site features	Off-site features
	Embankments are shown immediately adjacent to the northwest of the site (now understood to comprise part of the site), with the dyeworks in this area now labelled as works.	
1960-1980 (Mid to late 20th Century period)	 1967-1972 - The River Roch has been infilled through the site, and has been rerouted to flow offsite parallel to the southwestern boundary. Embankments are shown along its banks, suggesting a raising of levels may have occurred on site - The former buildings and allotments in the north west of the site have been demolished and replaced with a large rectangular building, labelled along with other buildings on site as Rochdale College.	- Holland Street immediately beyond the northern boundary (and on site) has been rerouted to become a straight road roughly orientated east to west, and renamed Bury Road. - High rise residential buildings and a telephone exchange replace the former mills present from approx. 50m north of the site. This area may have also been built up significantly as an embankment is shown, approx. 10m north of the site. - The ironworks 250m southwest of the site is no longer shown



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Time Period	On-site features	Off-site features
	- The south of the site has been redeveloped with 2 No. smaller buildings surrounded by landscaped areas. - Holland Street in the northeast and northwest of the site is no longer shown, rerouted beyond the northern boundary and renamed Bury Road and later College Road. An access road now crosses the far northwest of the additional area of the site, with the land to the west of this shown to be cleared and later labelled as car park (in the additional area on site).	- The former cattle market area located approx. 20m east of the site has been redeveloped as Police Headquarters and Memorial Gardens, which include an embankment suggesting raising of levels may have occurred. - The larger mills to the south of the new route of the River Roch (approx. 10m from the site) have been cleared, although an engineering works and textile mill still remain in the southwest of this area. These appear to be undergoing demolition by the 1972-1977 map.
1980 – 2000 (Late 20th century period)	 1979-1981	
	The northeastern and southeastern college buildings appear to have been linked together	The gas works and adjacent works approx. 250m to the southwest of the site appear to be undergoing partial demolition by 1987



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Time Period	On-site features	Off-site features
		• Clearance of the area from 25m northeast is ongoing, replaced with a Magistrates Court and Multistorey Car park by 1987 •
2000 to 2025 (Modern day period)	 Google Earth Aerial Imagery dated 2013	
	• Google Streetview last shows the large building in the northwest on imagery dated 2008, with the car park surfacing to be in completion in May 2012. The car park is shown in use by 2013 as shown on Google Earth Aerial Imagery. The smaller building in the south of the site is also shown to be undergoing demolition in this image.	• The former cricket ground and mill/works buildings have been redeveloped into a supermarket and commercial properties



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3.2. Preliminary Unexploded Ordnance Risk Assessment

From the historical mapping, although the surrounding area was industrial, this mainly comprised cotton mills which were not a target for German bombing raids. One building (a former theatre) approx. 10m east of the site is marked as 'ruins' on the historical mapping dated 1959, however this applies to the footprint of 1no. building only, with the adjacent buildings still shown in their original footprints and to be in use. As such, it is considered unlikely that the site was a target for bombing during WWII.

Bombing Britain data records only one incident for Rochdale, on 14th April 1941 during the daytime. No further details of the bombing are recorded.

Anecdotal evidence from the website www.rochdalewhatnot.co.uk records 'Other bombs dropped around the town were at Bellfield in August 1940, on Norden in October 1942 and near a row of houses at Red Lumb. There have always been stories that a bomb dropped near Firgrove and that it went straight into the canal although how authentic these stories are is unknown.' The nearest of these reported locations is Belfield located approx. 2km northeast and Firgrove located approximately 2.25km east (full link to website: <https://rochdalewhatnot.co.uk/index.php/world-war-ii-bombs-drop-on-rochdale/#::~:~:text=The%20Rochdale%20Observer%20reported%20that,fatal%20casualty%2C%20a%20Mrs%20Rossiter.>)

According to Zetica online risk maps, the site is located within a low-risk area, and no records of targets or UXO drops/finds have been recorded within the surrounding area.

In line with CIRIA C681: Unexploded ordnance (UXO) A guide for the construction industry, a preliminary UXO risk assessment has been completed.

Table 3.2 Preliminary UXO Risk Assessment.

	Yes/no	Comments
Is the site indicated to have been directly bombed?	No	There are no records of a direct bomb drop on site.
Is the site within an area recorded to have been bombed?	Yes	Bombing Britain data records only 1 No. occurrence however anecdotal evidence suggests 4 no. occurrences.
Could the site have been a high-risk target?	No	The area predominantly comprised textile industry which would have been unlikely to be a priority target for the Luftwaffe.
Any development cycles since 1945?	Yes	During the late 1950s the mills in the east were demolished and replaced with 2no. college buildings. In the 1960s-1970s the watercourse on site was diverted and infilled, with a building constructed over this area
Mitigating Factors	Yes	Soft/silty ground within the former watercourse route could increase the depth of a UXO.
Preliminary assessment of UXO Risk	Low	Records/anecdotal evidence indicates that the area was not heavily bombed, the area is unlikely to have been a Luftwaffe target and the area has been redeveloped following WWII.
Further works?	No	Not required due to low risk



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4. ENVIRONMENTAL SETTING

4.1. Geology

Table 4.1 Geological Summary.

Maps and publications referenced	Groundsure, BGS map Viewer, BGS map sheet Lancashire88NE, BGS Borehole Records SD81SE181 and SD81SE182 in the far south of the site.
Made ground / artificial ground	The site isn't shown to be located within an area of artificial ground according to the Groundsure report. Within the previous third party ground investigation, Made Ground was recorded across the site, to depths of between 0.95m and 6.80m bgl, with the deeper Made Ground encountered within the route of the former watercourse. The Made Ground typically comprised a tarmacadam/concrete surface underlain by varying proportions of clay, silt, sand and gravel, including some brick, concrete, metal, rubber and timber. Several boreholes were terminated on obstructions/refusal within the Made Ground at depths of between 1.58m and 4.80m bgl. Within the former river channel, slightly sandy silt was encountered beneath the Made Ground, which whilst no obvious evidence of anthropogenic materials were noted within this silt, it was anticipated that this silt was also probably Made Ground. The borehole records in the far south of the site record Topsoil to around 0.20m bgl, underlain by Made Ground comprising brick, stones, clay and ash to depths of between 1.71m and 3.35m bgl.
Drift geology	Alluvium (clay, silt, sand and gravel) in the north, with the majority of the site shown to be underlain by Glaciofluvial Deposits (Devensian, sand and gravel). These are likely to be underlain by Glacial Till. Third party logs from the 2021 Geotechnics ground investigation record asphalt surfacing (typically 0.15m thickness) with a limestone subbase recorded to between 0.37m and 0.60m bgl. This was underlain by further granular Made Ground (comprising either silty gravelly sand or sandy gravel) over cohesive Made Ground (comprising sandy silt or sandy gravelly lay) to depths of between 0.95m and 6.80m bgl. Where the base of the Made Ground was encountered, natural ground comprised Alluvium of sandy gravelly silt to depths of between 2.00m and 3.00m bgl in the north of the site, and Glaciofluvial Deposits comprising sand or gravel to depths of between 2.00m to 4.45m bgl elsewhere. Glacial Till comprising sandy gravelly clay was encountered from 3.00m to 4.40m bgl within CP01A in the northwest. The borehole records in the far south of the site record the superficial deposits to comprise brown sand over sand and coarse gravel to 3.84m bgl, underlain by further fine to coarse sand and gravel to the base of the borehole at 6.10m bgl within borehole record SD81SE181, and firm red brown boulder clay and soft laminated red brown clay to the base of the borehole at 6.10m within borehole record SD81SE182.
Solid geology	Pennine Lower Coal Measures Formation (mudstone, siltstone and sandstone). Within the previous third party ground investigation, the Pennine Lower Coal Measures were encountered from depths of between 3.70m and 6.80m bgl, comprising extremely weak to very weak dark grey siltstone, recovered as gravel.
Dip of solid strata	Recorded as between 3° and 5° to the southwest on map sheet Lancashire 88NE.
Faults	None shown within the immediate vicinity of the site.
Coal seams	An inferred coal seam subcrop is shown 18m northeast of the northeastern corner of the site, orientated northwest to southeast. Further information regarding coal seams beneath the site and the immediate surrounding area is given within the Coal Mining Risk Assessment.

4.2. Mining and Quarrying

The Coal Authority Consultants Coal Mining Report has been included within Appendix C. The coal mining risk to the site has been further discussed within the Coal Mining Risk Assessment for the site (report reference TE1880-TE-00-XX-RP-GE-003-V01, and should be referred to for further detail.



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Table 4.2 Other Extractive Industries.

	Yes/No	Comments
Superficial drift deposits		
Evidence of extraction on or within 250 m of the site?	Yes	Unspecified heap 40m SW, last mapped 1956; brick field 56m W, last mapped 1851; unspecified ground workings 79m W, last mapped 1992; unspecified ground workings 81m S, last mapped 1968; unspecified heap 94m E, last mapped 1938; unspecified pit 96m E, last mapped 1968; unspecified pit 119m SE, last mapped 1938; unspecified heap 153m S, last mapped 1938; refuse heap 156m S, last mapped 1851; unspecified ground workings 165m SE, last mapped 1968; unspecified pit 184m S, last mapped 1968; unspecified pit 190m SE, last mapped 1908; refuse heap 193m N, last mapped 1851; unspecified heap 198m S, last mapped 1890 unspecified heap 235m S, last mapped 1938; unspecified ground workings 237m S, last mapped 1992.
Action required?	Yes	Ground investigation is recommended to determine the risk of extractive industries beneath the site. Both shallow and deep (up to 40m bgl) methods of investigation are recommended to investigate the potential for underground workings beneath the site.
Solid Strata		
Any evidence of mineral extraction on or within 250 m of the site?	Yes	Unspecified heap 40m SW, last mapped 1956; brick field 56m W, last mapped 1851; unspecified ground workings 79m W, last mapped 1992; unspecified ground workings 81m S, last mapped 1968; unspecified heap 94m E, last mapped 1938; unspecified pit 96m E, last mapped 1968; unspecified pit 119m SE, last mapped 1938; unspecified heap 153m S, last mapped 1938; unspecified ground workings 165m SE, last mapped 1968; unspecified pit 184m S, last mapped 1968; unspecified pit 190m SE, last mapped 1908; unspecified heap 198m S, last mapped 1890 unspecified heap 235m S, last mapped 1938; unspecified ground workings 237m S, last mapped 1992.
Action required?	Yes	Ground investigation is recommended to determine the risk of extractive industries beneath the site. Both shallow and deep (up to 40m bgl) methods of investigation are recommended to investigate the potential for underground workings beneath the site.

Other, undocumented mineral workings on or close to the site cannot be completely dismissed.

4.3. Hydrogeology

Table 4.3 Groundwater Occurrence and Abstraction.

	Presence/location	Comments
Environment Agency aquifer designation – Superficial Deposits	On site - Glaciofluvial Deposits, Devensian - Sand And Gravel	Secondary A Aquifer
	On site - Alluvium	Secondary A Aquifer
	On site – Glacial Till	Secondary Undifferentiated
Environment Agency aquifer designation – Bedrock	On site - Pennine Lower Coal Measures Formation - Mudstone, Siltstone And Sandstone	Secondary A aquifer
Groundwater vulnerability	On site	Secondary superficial aquifer, high vulnerability



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	Presence/location	Comments
Anticipated groundwater depth(s)	On site	Groundwater strikes were recorded at depths of between 3.00m to 5.10m bgl within the previous third party ground investigation.
Direction of flow	On site	Anticipated to flow towards the southwest based on the River Roch present along the southwestern boundary and the general topography of the surrounding area
Current licensed abstractions – potable	Within 500m	None recorded
Current licensed abstractions – non-potable	Within 500m	None recorded
Private wells	Within 250m	None recorded
Source Protection Zones	Within 250m	None recorded
Springs	Within 250m	NR

NR - none recorded.

For definition of Source Protection Zones, see Appendix F.

4.4. Hydrology

Table 4.4 Surface Water Features.

	Presence/location	Comments
Nearest surface water feature	Southwestern site boundary	River Roch - Inland river not influenced by normal tidal action. Watercourse contains water year round (in normal circumstances)
Other surface water features	209m SW	River Spodden - Inland river not influenced by normal tidal action. Watercourse contains water year round (in normal circumstances)
Canals, ponds, lakes, etc.	Within 250m	NR
Water Framework Directive (WFD) Surface Water Bodies	Southwestern site boundary	Name: Roch (Source to Spodden). Water Body ID: GB112069064720. Overall Rating: Moderate. Chemical Rating: Fail. Ecological Rating: Moderate. Year: 2019.
Licensed surface water abstractions	Within 250m	NR
Surface run-off and site drainage	On site	The site predominantly comprises a car park, which is surfaced by asphalt, and is relatively level at around 119m AOD. Limited surface water drainage is present at the car park boundaries in the form of ACO drains, which it is understood drain to an interceptor present in the northeast of the car park area. Minimal grassed soft landscaped areas are present outside of the car park, to the northeast, southeast, south and northwest of the site.

NR - none recorded. Environment Agency GQA assessments: A = very good to E = poor



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4.5. Flood Risk Summary

Table 4.5 below represents a summary of the flood risk data contained within the Groundsure report obtained for the site.

Table 4.5 Flood Risk Summary

	Presence/location	Comments
Risk of Flooding from Rivers and Sea (RoFRaS)	On site	High risk
	Within 50m	High risk
Historical Flood Events	On site	Date of Flood: 28/07/2019 and 31/07/2019. Flood Source: main river. Flood Cause: Channel capacity exceeded (no raised defences). Type of Flood: Fluvial.
		Date of Flood: 16/03/2019. Flood Source: drainage. Flood Cause: local drainage/ surface water. Type of Flood: Fluvial.
		Date of Flood: 26/12/2015. Flood Source: unknown. Flood Cause: unknown. Type of Flood: no data.
	11m W	Date of Flood: 16/03/2019. Flood Source: unknown. Flood Cause: unknown. Type of Flood: fluvial.
	89m W	Date of Flood: 21/01/2008 and 22/01/2008. Flood Source: main river. Flood Cause: unknown. Type of Flood: fluvial.
	165m E	Date of Flood: 26/12/2015. Flood Source: main river. Flood Cause: channel capacity exceeded (no raised defences). Type of Flood: fluvial.
	177m W	Date of Flood: 16/03/2019. Flood Source: drainage. Flood Cause: local drainage/ surface water. Type of Flood: fluvial
	179m W	Date of Flood: 21/12/1991 and 22/12/1991. Flood Source: unknown. Flood Cause: channel capacity exceeded (no raised defences). Type of Flood: no data
	224m E	Date of Flood: 16/03/2019. Flood Source: drainage. Flood Cause: local drainage/surface water. Type of Flood: fluvial.
Flood Defences	131m W	Located to the west of Rochdale Sixth Form College.
Areas Benefiting from Flood Defences	Within 250m	NR
Flood Storage Areas	Within 250m	NR
Records of Flood Zone 2	On site	Zone 2 (fluvial/tidal models)
Records of Flood Zone 3	On site	Zone 3 (fluvial models)
Surface water flooding	On site	Highest risk: 1 in 30 year, greater than 1.0m
	Within 50m	Highest risk: 1 in 30 year, greater than 1.0m
Groundwater flooding	On site	Highest risk: Moderate
	Within 50m	Highest risk: Moderate

NR - none recorded



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4.6. Environmental Designations

Table 4.6 Summary of Environmental Designations.

	Presence/location	Comments
Sites of Special Scientific Interest (SSSI)	Within 250m	NR
Conserved wetland sites (Ramsar sites)	Within 250m	NR
Special Areas of Conservation (SAC)	Within 250m	NR
Special Protection Areas (SPA)	Within 250m	NR
National Nature Reserves (NNR)	Within 250m	NR
Local Nature Reserves (LNR)	Within 250m	NR
Designated Ancient Woodland	Within 250m	NR
Biosphere Reserves	Within 250m	NR
Forest Parks	Within 250m	NR
Marine Conservation Zones	Within 250m	NR
Green Belt	Within 250m	NR
Proposed Ramsar sites	Within 250m	NR
Possible Special Areas of Conservation (pSAC)	Within 250m	NR
Potential Special Protection Areas (pSPA)	Within 250m	NR
Nitrate Sensitive Areas	Within 250m	NR
Nitrate Vulnerable Zones	Within 250m	NR
SSSI Units	Within 250m	NR

NR - none recorded

4.7. Landfill and Waste Management Activity

Table 4.7 Waste Management Activities.

	Presence/location	Comments
Active or recent landfill	Within 250m	NR
Historical landfill (BGS records)	Within 250m	NR
Historical landfill (LA/mapping records)	Within 250m	NR
Historical landfill (EA/NRW records)	204m W	Site Address: Central Tip, Eden Street and Grimble Street, Rochdale, Greater Manchester. There are no further records regarding the license holder, waste license, waste type, license surrender, operator or first and last recorded dates of operation.
Historical waste sites	Within 250m	NR
Licensed waste sites	Within 250m	NR



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	Presence/location	Comments
Waste exemptions	160m NE	Site: Linear Network – Rochdale. Reference: EPR/UF0907SM/A001. Category: Disposing of waste exemption, using waste exemption. Sub-category: Non-agricultural waste only. Description: Deposit of waste from dredging of inland waters, use of waste in construction.
	167m W	Site: Unit 1, Mitchell Hey Mill, College Road, OL12 6ae, Rochdale, OL12 6ae. Reference: WEX281758. Category: storing waste exemption, treating waste exemption, using waste exemption. Sub-category: not on a farm. Description: storage of waste in a secure location, Preparatory treatments (baling, sorting, shredding etc), use of waste for a specified purpose.
Evidence of other landfilling or potential infilling on or within 250m of site	On site	Infilled water course running through centre of site, possible excavation or stockpile along the northwestern banks of the former river route. Embankments along the new route of the River Roch suggest site levels may have been raised. Numerous infilled features as described in Table 4.2.
Walkover evidence of fly-tipping on site?	On site	NR
Is a landfill/ground gas risk assessment required?	Yes	Due to the infilled former watercourse running through the site, the general depth of Made Ground recorded during the previous third party ground investigation (up to 6.80m bgl), Made Ground associated with the historical and surrounding land uses and the presence of alluvium and former river sediment beneath the site.

NR - none recorded

4.8. Local Industrial Land Uses

Other potentially contaminative activities are shown in Table 4.8 below with those features considered pertinent to the conceptual site model highlighted in **bold**. The entries relate to activities within *circa* 250 m of the site, with the exception of COMAH facilities where the assessment is extended to a distance of *circa* 500m from the site.

Table 4.8 Other Potentially Contaminative Processes in the Locality

	Location	Comments
Recent industrial land uses	28m SW	Slipway
	94m W	Electricity substation (hydraulically downgradient)
	106m SW	Petrol and fuel station (hydraulically downgradient)
	124m N	Second hand vehicles
	141m to 143m E	Vehicle industrial products
	164m N	Paints, varnishes and lacquers
	188m SW	Petrol and fuel station
	234m W	Metals Manufacturers, Fabricators and Stockholders
	236m SW	Rubber, silicones and plastics
	237m SE	Electricity substation
	249m W	Unspecified works
Current or recent petrol stations	194m SW	Asda petrol station (no LPG)
Electricity cables	Within 250m	NR



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	Location	Comments
Gas pipelines	Within 250m	NR
Sites determined as Contaminated Land	Within 250m	NR
Control of Major Accident Hazards (COMAH)	10m S	British Gas – historical NIHS site (hydraulically downgradient)
	281m SW	National Grid – historical COMAH site (hydraulically downgradient)
Regulated explosive sites	Within 250m	NR
Hazardous substance storage/usage	Within 250m	NR
Historical licensed industrial activities (IPC)	Within 250m	NR
Licensed industrial activities (Part A(1))	176m E	Operator: P.W.GREENHALGH & CO.LIMITED. Installation Name: Newhey Bleach Works - EPR/BP0628IW. Process: PRE-TREATING OR DYEING FIBRES OR TEXTILES >10 TPD. Permit Number: BP0628IW. Original Permit Number: BP0628IW. EPR Reference: EPR/BP0628IW. Issue Date: 28/01/2004. Effective Date: 28/01/2004. Last date noted as effective: 06/08/2024. Status: Superseded
		Operator: P.W.GREENHALGH & CO.LIMITED. Installation Name: Newhey Bleach Works - EPR/BP0628IW. Process: COATING, PRINTING AND TEXTILES; PRETREATING BY WASHING ETC >10T/DAY. Permit Number: BP0628IW. Original Permit Number: BP0628IW. EPR Reference: EPR/BP0628IW. Issue Date: 28/01/2004. Effective Date: 28/01/2004. Last date noted as effective: 06/08/2024. Status: Superseded
Licensed pollutant release (Part A(2)/B)	98m SW	Johnsons Dry Cleaners UK Ltd, Within ASDA, Dane Street, Rochdale, Lancashire, OL11 4EZ. Process: Dry Cleaning. Status: Historical Permit. Permit Type: Part B. Enforcement: No Enforcements Notified. Date of enforcement: No. Enforcements Notified. Comment: No Enforcements Notified. (Hydraulically downgradient)
	192m SW	Asda Petrol Site, Dane Street, Rochdale, Lancashire, OL11 4EZ. Process: Unloading of Petrol into Storage at Service Stations. Status: Current Permit. Permit Type: Part B. Enforcement: No Enforcements Notified. Date of enforcement: No Enforcements Notified. Comment: No Enforcements Notified. (Hydraulically downgradient)
Radioactive Substance Authorisations	Within 250m	NR
Licensed Discharges to controlled waters	On site	Effluent Type: SEWAGE DISCHARGES - SEWER STORM OVERFLOW - WATER COMPANY. Permit Number: 016950161. Permit Version: 2. Receiving Water: RIVER ROCH. Status: MODIFIED - (WRA 91 SCHED 10 - AS AMENDED BY ENV ACT 1995). Issue date: 11/07/2005. Effective Date: 11/07/2005. Revocation Date: 27/10/2020
Pollutant release to surface waters (Red List)	Within 250m	NR
Pollutant release to public sewer	Within 250m	NR
List 1 Dangerous Substances	Within 250m	NR
List 2 Dangerous Substances	Within 250m	NR



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	Location	Comments
Pollution Incidents (EA/NRW)	127m SE	Incident Date: 18/01/2003. Incident Identification: 131849. Pollutant: Oils and Fuel. Pollutant Description: Diesel. Water Impact: Category 3 (Minor). Land Impact: Category 4 (No Impact). Air Impact: Category 4 (No Impact) . (Hydraulically downgradient)
	132m SE	Incident Date: 21/08/2003. Incident Identification: 184143. Pollutant: Sewage Materials. Pollutant Description: Crude Sewage. Water Impact: Category 3 (Minor). Land Impact: Category 4 (No Impact). Air Impact: Category 4 (No Impact) . (Hydraulically downgradient)
	160m NE	Incident Date: 22/11/2001. Incident Identification: 44441. Pollutant: Pollutant Not Identified. Pollutant Description: Not Identified. Water Impact: Category 3 (Minor). Land Impact: Category 4 (No Impact). Air Impact: Category 4 (No Impact)
Pollution inventory substances	Within 250m	NR
Pollution inventory waste transfers	Within 250m	NR
Pollution inventory radioactive waste	Within 250m	NR

NR - none recorded

COMAH – Control of Major Accident Hazards (regulations); NIHS – Notification of Installations Handling Hazardous Substances (regulations)

4.9. Radon Risk

A BGS GeoReport for radon has been obtained for the site and is included within Appendix B. Table 4.9 summarises the report outcome below.

Table 4.9 Radon Risk Status.

	Comments
Estimated properties affected	Less than 1% of properties above the Action Level.
Does a basement (or converted cellar/basement) form part of the proposed development?	As stated within BR 211, basements represent areas that are more at risk because the walls are in contact with the ground as well as the floor. This, coupled with reduced natural ventilation below ground level, increases the risk of elevated radon levels. All basements are therefore considered under BR 211 to be at increased risk of elevated levels of radon regardless of geographic location. Currently, it is understood that no basements are proposed for the development and therefore no additional consideration of potential increased risk needs to be made; however, this should be revisited in the event that the proposals change to include for a basement.
Radon Protection Measures required?	Radon protection measures are not required.

4.10. Waste Classification and Materials Re-Use

If the site is to be redeveloped and materials are disposed off site, the material exported from the site to landfill should be hauled by a register waste character in accordance with Duty of Care Regulations 1991 and the Hazardous Waste Regulations 2005.



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Based on the history of the site and the anticipated potential contaminants of concern, it is considered likely that hazardous waste soil materials may be present beneath the majority of the site; however, this will be subject to confirmatory investigation, sampling, laboratory analysis and waste classification in accordance with the Guidance on the Classification and Assessment of Waste (WM3).

It will be necessary to register the site in advance of the intended reclamation works with the Environment Agency before disposal to landfill can take place. There will be requirement for the waste producer to provide appropriate Waste Acceptance Criteria (WAC) testing of the Soils for disposal to ensure that the soils are appropriately classified and that the landfill is licensed to receive such soils. A consignment note shall be completed, signed and retained by all parties involved. The consignment note shall state the volume of waste, a physical description of the material and statement of its chemical composition. The waste consignment notes shall be kept by the contractor for a period of at least two years.

Subject to volumetric fill requirements and a future assessment of suitability of re-use (both chemically and geotechnically), some materials may be considered for potential re-use in line with an appropriate end-of-waste protocol such as WRAP Quality Protocol for Aggregates from Inert Waste, U1 Exemption or a Materials Management Plan in accordance with the CL:AIRE Definition of Waste Code of Practice (DoWCoP). Please note that any previously landfilled or mining waste materials may not be appropriately subject to consideration under DoWCoP and may not be re-used under DoWCoP unless sufficient lines of evidence and agreement with the local Environment Agency Waste Team can be sought beforehand.

Re-Use of Excavated and Stockpiled Clean Naturally Occurring Soils on Other Sites

In addition, Tier Environmental are aware that CL:AIRE is classing stockpiled clean, naturally occurring soils as waste, unless their final destination is identified in a Materials Management Plan, before they are excavated. However, Tier Environmental consider that any clean naturally occurring soils arising from enabling works, earthworks or construction activities would be regarded as an asset and the default assumption for this site (prior to excavation and stockpiling) is not the intention to discard these materials where they may be reasonably re-used on this, or another, development site. Stockpiling is a recognised, recommended means of safely storing soils. Whilst there may be advantages to leaving soils in-situ, stripping topsoil and subsoil prior to earthworks is a routine construction activity. Tier Environmental consider that it is not unreasonable to state that in the event that the developer owns another site where the construction phase is ongoing, soils can be transferred between their sites as an owned product and never become waste.

The above paragraph above is therefore considered a clear intention to reuse any clean, naturally occurring soils derived from excavations at this site (which may also include temporary stockpiling these materials). It is considered; however, that in addition to this the following must be adhered to:

- Reuse does need to occur within a 'reasonable' timeframe (12 No. months); and,
- If soils are transferred to a third party (another developer), there needs to be some contractual agreement in place, as in this situation it is important to have something in place confirming that surplus soils are required by the third party.

Re-Use of Excavated and Stockpiled Clean Naturally Occurring Soils Within The Site They Are Excavated From

Further to the above, where soils are naturally occurring, uncontaminated and re-used on the site they are excavated from, they fall outside of the Waste Framework Directive (WFD) i.e. they will not be classified as a waste. Currently the CL:AIRE Definition of Waste Code of Practice states the following which appears to support this position: *"If the material is waste an Environmental Permit will be required to lawfully deposit or re-use it unless the material is "uncontaminated soil and other naturally occurring material excavated in the course of construction activities where it is certain that the material will be used for the purposes of construction in its natural state on the site from which it was excavated", which is excluded from waste regulation by the Waste Framework Directive (2008)."*



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4.11. Regulator Provided Information

Relevant searches for the site have been conducted by the Environment Agency / Local Authority / Fire Service / Petroleum Licencing Officer and the information has been summarised below:

Environment Agency

The EA have provided the following information for the site:

- EA records report there are two historical landfills located within 500m of the site as detailed below
 - o A historical landfill is recorded approx. 197m east of the site. The only information held is that the former landfill was known as 'Central Tip' and was located at Eden Street and Grimble Street Rochdale Greater Manchester.
 - o A historical landfill is recorded approx. 494m west of the site. The only information we hold on record is that the former landfill was known as 'Sandy Brow' and was located at Sandy Brow Rochdale Manchester.
 - o Both sites are reported to have been infilled before the controls imposed under the Control of Pollution Act 1974.
- There were no odour or other pollution sites directly on the site, but there were 3 pollution incidents in the Rive Roch which forms the southern boundary of the site in the 2000s. Information regarding these pollution incidents is summarised below
 - o Date: 28/08/2005. Location: Toad Lane, Rochdale. NGR: SD 89267 13347. Water Incident: Category 3 (Minor). Cause: not identified. Pollutant: Not identified.
 - o Date: 07/07/2023. Location: R. Roch behind College Road, Rochdale. NGR: SD 89263 13347. Water Incident: Category 3 (Minor). Cause: Containment and Control Failure. Pollutant: crude sewage.
 - o Date: 13/03/2007. Location: College Campus, College Road, Rochdale. NGR: SD 89305 13257. Water Incident: Category 3 (Minor). Cause: other (supermarket trolley in river). Pollutant: other inert material or waste.
- Our GWCL team have previously been consulted on the following planning applications for Hopwood Hall College.
 - o Planning Reference number: 08/D51561: Erection of new sixth form college.
 - o Planning Reference number: 09/D51750: Review of validation report
 - o Planning Reference Number: 12/D55197. Construction of new student / staff visitors carpark and associated landscaping.
 - o We have reviewed land quality reports submitted in support of the above planning applications. You can obtain copies by searching on Rochdale's Local planning portal which can be accessed here [Simple Search](#) using the relevant planning application numbers above. If they are unable to find copies of the land quality reports we would advise you contact Rochdale Local Authority
- We hold no information pertaining to known geotechnical issues such as sinkholes, subsidence, mining related issues etc
- We hold no information with regards to asbestos. In this case, the information you have requested is not held by the Environment Agency, and we are therefore refusing your request on the grounds that there is no information we can provide.

Further information is included within Appendix D.

Local Authority

Rochdale Borough Council have provided the following responses to the requested information for the site:

- Records of any landfills on or within the vicinity of the site: There are no registered landfills on or within close proximity to the site.
- Any information pertaining to historic contaminated land uses or contamination concerns: The site has a history of previous use but has not been prioritised for further inspection.



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- Any records of odour complaints or similar evidence of historic contamination: None within the contaminated land information database.
- Information of any asbestos: No
- Information associated with any historic site investigations: The department has no records of previous ground investigations.
- Information associated with any previous remediation: As above.
- Any pertinent information regarding the site and the environmental setting surrounding the site: None.
- Any pertinent information pertaining to known geotechnical issues such as sinkholes, subsidence, mining related: None known.

Further information is included within Appendix D.

Fire Service (Greater Manchester Combined Authority)

Greater Manchester Combined Authority have provided the following information regarding fires at the site:

- Time/date of call: 24/06/2015 21:48:51. Incident: Fire. Cause/motive: Deliberate - unknown owner. Property Type: Property/Outdoor/Other outdoors (including land)/Loose refuse (incl in garden). Number of Appliances in attendance: 2. Type of equipment used: Water Delivery - Hosereel - high pressure. No PFAS containing firefighting foam used. Volume used to put out fire: not recorded. Reported run-off into drains/ground: not recorded.
- Time/date of call: 02/12/2009 13:30:33. Incident: Fire. Cause/motive: Accidental. Property Type: Property/Building/Non Residential/Education/College/University. Number of Appliances in attendance: 3. Type of equipment used: None. No PFAS containing firefighting foam used. Volume used to put out fire: not recorded. Reported run-off into drains/ground: not recorded.
- Time/date of call: 08/01/2010 10:40:26. Incident: Fire. Cause/motive: Accidental. Property Type: Property/Building/Non Residential/Education/College/University. Number of Appliances in attendance: 2. Type of equipment used: None. No PFAS containing firefighting foam used. Volume used to put out fire: not recorded. Reported run-off into drains/ground: not recorded.

Further information is included within Appendix D.

Petroleum Licensing Officer

Greater Manchester Fire and Rescue have provided the following information regarding the storage of petroleum spirits at the site:

'The Authority has reviewed the site historical files and records for any past or current licensed storage of petroleum within the site address above. The review has not identified any evidence that petroleum spirit was stored at this site.

However, if whilst undertaking future works and at any time it becomes apparent to contractors that above or underground petroleum tanks are present, which may not have been rendered permanently safe, the Authority must be informed immediately.

Please be aware that disused petrol tanks that have been certified as having been made safe by the use of resin generated foam may still be in an unsafe condition. It has been proven that foam filled underground tanks may be dangerous if disturbed due to the foam degrading over time and the risk of ullage spaces in the tanks filling with explosive, flammable and hazardous atmospheres. Any work being carried out on or near to tank(s) or the tank removed, should only be carried out by people that are competent to carry out this type of work and who have the necessary skills and knowledge to take the appropriate precautions necessary to deal with potential flammable atmospheres.

It should also be noted that the Authority only took over responsibility for petroleum licensing in 1986. Prior to this date the licensing was carried out by the Local Authority Trading Standards. Whilst every endeavour has been made to search back, we cannot guarantee that there was no storage



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prior to 1986. The Authority only has responsibility for petroleum and related products that are legally required to be licensed. Any diesel tanks in the area would not have required notification, therefore no records of such tanks may be available.'

The response is included within Appendix D.



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5. PREVIOUS INVESTIGATION FINDINGS

Previous reports have been undertaken by Geotechnics on behalf of Mott Macdonald Limited (commissioned by the Department of Education), titled 'Geoenvironmental and Geotechnical Desk Study Report' (reference PC218240, dated July 2021) and 'Preliminary Ground Investigation Report with Interpretive Chapter' (reference 'PN214280' and dated November 2021). These reports have been summarised below, and should be referred to for further detail.

Table 5.1 Geotechnics Reports - Review Summary

Site history	On site historical land uses included cotton mills, dyeworks, infilled and diverted River Roch flowing through the site with a weir located centrally to site, cutting of land directly north of the weir, works buildings, Sunday school, allotment gardens, technical college, current day college buildings and car park. Pertinent surround land uses included a dye works to the south, cattle market, mills, and evidence of groundworks.
Potential contaminative features identified	Wide variety of contaminants associated with fill in the former river channel, PCBs from substation, potential ash, petroleum hydrocarbons and pesticides/herbicides from historic allotment gardens, potential dyes and feeder compounds (including VOCs and SVOCs) associated with dye works, ground gases and coal mine gas.
Mining and quarrying	No evidence of mining. Potential for unrecorded shallow workings beneath the site.
Unexploded Ordnance Risk	The Geotechnics report references the Alpha Associates Preliminary Unexploded Ordnance (UXO) Threat Assessment - 14th June 2021, which concludes that the site is at Low Risk with no action required.
Fieldwork	Four Dynamic Sample Boreholes to depths ranging between 1.51m and 4.45m bgl. Five 150mm diameter boreholes by Cable Percussion Tool techniques to between 1.58m and 7.45m bgl. Four gas and groundwater monitoring visits.
Laboratory testing	Chemical testing of soil samples for environmental purposes included testing for metals, PAHs, TPH CWG, MTBE, pH, sulphate and total sulphur, cyanide, TOC, VOC, phenols, and screened for asbestos. Leachate samples were also tested for metals, pH, sulphate, sulphide, fluoride, cyanide, ammoniacal nitrogen and chloride, whilst groundwater samples were tested for metals, PAHs, TPH CWG, pH, sulphate, sulphide, fluoride, cyanide, ammoniacal nitrogen, chloride and total hardness. Geotechnical laboratory testing included water content determination, particle size distribution, determination of liquid and plastic limits and BRE Special Digest 1 Suite.
Ground conditions	The Made Ground is generally underlain by Alluvium and Glacial Deposits above a base of Pennine Lower Coal Measures bedrock. Obstructions were encountered within the Made Ground.
Ground stability	Unstable ground conditions or collapse of exploratory holes was not mentioned within the exploratory hole logs or report.
Foundations and floor slab recommendations	Geotechnics anticipated that the proposed college building will be supported on piled foundations, these being taken down into the Pennine Lower Coal Measures strata. However, further deep investigation will be required by rotary drilled boreholes in order to confirm that the site is stable with respect to shallow coal workings.
Sulphate class	Testing indicates that subsurface concrete should be designed to comply with the AC-2 classification of BRE Special Digest 1.
Contamination – Human Health	Low concentrations of asbestos have been encountered in Made Ground. Any further work with Made Ground will require work to be undertaken in accordance with the Control of Asbestos Regulations (CAR) and Managing and Working with Asbestos – Approved Code of Practice (ACoP). Further assessment of Asbestos in shallow soil may be required, depending on the details of redevelopment plans in relation to Made Ground.
Contamination – Controlled Waters	Concentrations of soil leaching contaminants show that there are no significant risks to controlled water receptors. Concentrations of contaminants in groundwater show no significant risks to be present.
Gas protection	Ground gas monitoring has confirmed that there are no significant sources of ground gases present affecting the site and the ground gas regime is classified as Gas Regime A for methane and carbon dioxide and no ground gas protection measures are required for any proposed structures.
Radon Requirements	Not advised.
Soakaways	Not undertaken.



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Other issues	High pH values (up to pH = 11.8) have been recorded and may impact upon other buried elements, such as service pipes. Guidance should be sought from the manufacturers of service pipes etc. regarding their suitability for use in these ground conditions.
Further works identified	Further deep investigation will be required by rotary drilled boreholes in order to confirm that the site is stable with respect to shallow coal workings. Rotary coring of the Pennine Lower Coal Measures bedrock would also help to inform the pile design. Given the variations in depth to bedrock, it is anticipated that pile lengths will need to vary across the site. A fully suspended floor construction should be used. Geotechnics advised carrying out further monitoring of groundwater levels through a winter period in order to ascertain the likely highest groundwater levels. Any further work with Made Ground will require work to be undertaken in accordance with the Control of Asbestos Regulations (CAR) and Managing and Working with Asbestos – Approved Code of Practice (ACoP). Further assessment of Asbestos in shallow soil may be required, depending on the details of redevelopment plans in relation to Made Ground.
Waste Soils Classification	Not undertaken.
Materials re-use considerations	Not advised.



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6. GROUND GAS CONCEPTUAL SITE MODEL CONSIDERATION

6.1. Potential Ground Gas Sources and Gas Generation Potential

BS 8576:2013 outlines the importance of determining the gas generation potential on a given site by examining the potential source's characteristics, such as the type of waste or organic content, that could produce hazardous gases like methane or carbon dioxide. However, risk assessment is a separate step, which considers pathways and receptors, using factors like Gas Screening Values (GSV) to estimate potential exposure and impact on receptors.

As such, it is important to delineate "generation potential" (linked to source characteristics) from "risk" (dependent on exposure likelihood and receptor sensitivity).

Tier Environmental has used material type descriptions and generation potential designations alongside the risk of lateral migration determinations from a combination of BS 8576:2013 and The Local Authority Guide to Ground Gas, CIEH (2008) and assessed their presence or otherwise for this site in the table below.

For further information of current site use, current surrounding land use, site history and surrounding land use history please refer to Sections 2 and 3.



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Table 6.1 Potential Ground Gas Source Generation Potential (from BS 8576:2013 and The Local Authority Guide to Ground Gas, CIEH (2008))

BS 8576:2013 Generation Potential of Source		Risk of Lateral Migration (from The Local Authority Guide to Ground Gas, CIEH (2008))	Potential On-Site Source?	Potential Off-Site Source?
Generation Potential	Material Types			
Very low	Natural carbonate soil and strata, e.g. chalk and limestone.	Negligible	No	No
	Natural soil strata with a low degradable organic content, e.g. alluvium	Negligible	Yes	Yes
	In-filled pond less than 15 m diameter, in-filled before 1930s to 1940s.	Negligible	Infilled former watercourse on site which is greater than 15m.	Yes
	Made ground with low degradable organic content (e.g. up to 5% organic material such as pieces of wood, pieces of paper, rags, etc. with a high proportion of ash and no food or other easily degradable waste).	Negligible	Yes	Yes
	Mine workings shallow or shaft (where there is clear evidence that they are flooded). (Gas in coal is historically generated and is trapped or adsorbed so the actual current generation rate is very low but it accumulates in workings and large volumes can be emitted very quickly.)	Variable – depends on extent of workings, geology and hydrogeology	Yes. Groundwater levels appear to be high. Potential for shallow coal mine workings. See coal mining risk assessment for further details.	Yes
	Inert landfill sites. (Lack of regulation in the past means that most sites are never entirely inert – they can include timber, plasterboard and even domestic refuse and consequently care is needed when assessing such sites. They might require a higher risk classification.)	Low	No.	Yes, historical landfill Circa 200m west of the site. The site is reported to have been infilled before the controls imposed under the Control of Pollution Act 1974. As such, the precise nature of the materials remains unknown.
	Hydrocarbon impacted soils (anaerobic degradation)	Negligible	The previous third party ground investigation recorded localised hydrocarbon contamination in the form of black stained material with a hydrocarbon odour in the northeast of the car park. Possible elsewhere due to historic industrial land use	No.
Very low / low	Natural soil strata with a high degradable organic content (DOC) e.g. peat (note: gas in peat is historically generated and is trapped or adsorbed in the soil so the actual current generation rate is very low)	Negligible	Yes, potential for organic rich materials associated with the former infilled watercourse and natural Alluvium.	Yes, potentially organic rich deposits associated with the River Roch deposits and nearby Alluvium.
Low *	Made ground with total organic carbon (TOC) up to 6% (e.g. dock silt. No food or other easily degradable waste).	Negligible	Expected due to historic industrial land use . The former watercourse running through the centre of the site has been infilled, with Made Ground recorded to a maximum depth of 6.80m bgl within the previous third party ground investigation	No
	Foundry sand (includes phenolic binders, rags and wood that decay, albeit at low rates).	Very low	No	No
	Landfill 1945 to mid-1960s (see also “moderate”).	Low/moderate – depends on geology	No	Yes, historical landfill Circa 200m west of the site. The site is reported to have been infilled before the controls imposed under the Control of Pollution Act 1974. As such, the precise nature of the materials and date of landfilling remains unknown.
Moderate	Sewage sludge / cess pits.	Very low	No	No
	Mine workings – unflooded, more than 50 years since last worked (gas is liberated from coal when mine workings are excavated; this continues for up to about 50 years).	Variable – depends on extent of workings, geology and hydrogeology	No	No
	Landfill 1945 to mid-1960s (this could also be “low” or, if disturbed, “high”).	Low/moderate – depends on geology	No	No, it is presumed that the landfill Circa 200m away is more likely to trigger a low gas generation potential.
High	Landfill mid-1960s to early 1990s.	Moderate to very high	No	No, it is presumed that the landfill Circa 200m away is more likely to trigger a low gas generation potential.
	Mine workings – unflooded – less than 50 years since last worked.	Variable – depends on extent of workings, geology and hydrogeology	No	No
Very High	Municipal landfill sites.	Moderate to very high or Low (assuming site has engineered containment systems)	No	No
	Landfill early 1990s onwards.	Low (assuming site has engineered containment systems)	No	No

Notes - * Higher TOCs might not always indicate high degradability. For example, coke breeze can contain up to 51% TOC but only 4% DOC. In this case, the assessor should estimate what proportion of the TOC is degradable.



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6.2. Appropriate Level of Ground Gas Monitoring

It can be seen from Table 6.1 that potential on-site ground gas sources have been identified that have between a very low, very low/low and low gas generation potential.

BS 8576:2013

In accordance with Section 8.7 from BS 8576:2013, the decision matrix below derived from Figure 6 in the British Standard has been used to determine the appropriate level of gas monitoring for the site. The extent of gas monitoring that is required is based on the generation potential of the source(s) determined in Table 6.1, i.e. what is the risk that large volumes of gas can be generated and can credibly migrate to pose a credible hazard to the identified receptors? The British Standard also describes that it might be appropriate to take into account the sensitivity of the receptor, the existence of site-specific migration pathways and mechanisms that could affect migration, such as groundwater level movements when determining the gas monitoring requirements.

Figure 6.1 Decision Matrix For Initial Monitoring (Extracted from Figure 6 in BS 8576:2013)

	Generation potential of source				
Gas monitoring requirements	Very low	Low	Moderate	High	Very high
Gas monitoring might not be necessary					
Gas monitoring over a period of 2 months with up to weekly measurements					
Gas monitoring over a period of 2 months up to 6 months with up to fortnightly readings					
Gas monitoring over a period of 6 months up to 12 months with up to fortnightly readings. Use high frequency monitoring where appropriate					

NOTE The darker the section on the matrix, the more likely it is that monitoring is needed.

Note from BS 8576:2013: There could be occasions when “low potential” sites require more monitoring than those with a higher gas generation potential. On a site where there are high gas concentrations and/or flow rates this can become apparent following a single round of monitoring and further monitoring is unlikely to alter the assessment of potential risks. On the other hand, some sites with low gas concentrations and/or flow rates are more susceptible to changes in atmospheric pressure, etc. and therefore require a longer period of monitoring in order to assess the potential risks with confidence.



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An assessment has been made as to whether a potential off-site source of gas warrants additional consideration based on its distance from site, local geology and whether the risk of lateral migration gas migration is high enough. In turn it has been assessed whether doing so merits increasing the proposed periods of monitoring. It is not considered that the presence of the landfill located 200m east warrants additional consideration of increasing the monitoring beyond that which will be implemented on site.

CIRIA C665

Additionally, due consideration has been made of Tables 5.5a and 5.5b in CIRIA C665 which offers guidance on "typical/idealized" monitoring periods and frequencies for gas monitoring based on proposed land use, sensitivity, and the gas generation potential of the source.

Table 6.2 and Table 6.3 demonstrate how, in accordance with CIRIA C665, the periods and frequency of monitoring have been selected for the site.

Table 6.2 From Table 5.5a CIRIA C665 - Typical/idealised periods of monitoring (after Wilson et al, 2005)

		Generation Potential of the Source				
		Very Low	Low	Moderate	High	Very High
Sensitivity of development	Low (commercial)	1 month	2 months	3 months	6 months	12 months
	Moderate (flats)	2 months	3 months	6 months	12 months	24 months
	High (residential with gardens)	3 months ¹	6 months	6 months	12 months ¹	24 months

Notes:

1 NHBC guidance also recommends this period of monitoring (Boyle and Witherington, 2007).

2 There is no industry consent over "high", "medium" or "low" generation potential of source.

Table 6.3 From Table 5.5b CIRIA C665 - Typical/idealised frequency of monitoring (after Wilson et al, 2005)

		Generation Potential of the Source				
		Very Low	Low	Moderate	High	Very High
Sensitivity of development	Low (commercial)	4	6	6	12	12
	Moderate (flats)	6	6	9	12	24
	High (residential with gardens)	6 ¹	9	12	24 ¹	24

Notes:

1 NHBC guidance also recommends this period of monitoring (Boyle and Witherington, 2007).

2 There is no industry consent over "high", "medium" or "low" generation potential of source.

Consideration of High Frequency (Continuous) Gas Monitoring

Table 6.4 below has been prepared in order to assess whether high frequency (continuous) gas monitoring should be considered for the site.



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Table 6.4 Factors Considered for High Frequency (Continuous) Gas Monitoring

Factors	Tier Environmental Assessment
Are there any mineshafts on site?	No.
Are there any recently closed mining workings on or near to the site?	No.
Are there any landfills on or near to the site where large volumes of gases could be emitted (see Table 6.1 for definitions of generation potential of different landfill types)	No. The landfill located 200m east is not considered to fit into this category.
Is there any previous gas monitoring that indicates a higher gas regime than expected from the conceptual model?	No reliance can be placed on previous ground gas data.
Is the site in an area where there may be tidal influence on the groundwater (and therefore the gas regime may fluctuate)?	No.
Are there time constraints that may trigger the requirement for continuous gas monitoring?	No.
Are there any sensitive receptors that may warrant additional continuous gas monitoring?	No. There are no residential properties proposed.
Conclusions	On the basis of the above, it is not considered that continuous gas monitoring is required for the site.

Overall Determination

Overall, it is concluded that 6 No. ground gas monitoring visits over a minimum two month period will be sufficient for the proposed development.

6.3. Potential Pathways

Table 6.5 below summarises potential pathways identified as relevant to the site.

Table 6.5 Potential Ground Gas Pathways Identified

Potential Pathways	Present On / Beneath the Site?	Present Between Potential Off Site Source And The Site?
Permeable strata	Yes	Yes
Ingress into confined spaces (e.g. basements)	Not proposed for the new development.	N/A
Fractures or joints in rock	Yes	Yes
Utility services or ducts – existing	Yes	Yes
Utility services or ducts – future / proposed as part of development	Yes	Yes
Foundation structures (e.g. vibro stone columns) either pre-existing or proposed	No. It is understood that piles socketed into the bedrock are currently being considered.	No
Drainage systems (including culverts)	Not beyond service ducts considered above.	Not beyond service ducts considered above.
Mine workings / voids / coal seams	Coal seams may be present beneath the site.	Coal seams may be present beneath the site and the surrounding area.
Mine shafts	No	No
Other future construction created pathways	No	No



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6.4. Receptors

Construction and maintenance workers. Future users of the college and nursery areas.



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7. PRELIMINARY CONCEPTUAL SITE MODEL

Based on the information provided in the previous sections of this report a combined preliminary conceptual site model and conceptual exposure model has been developed for the proposed future land use. This summarises the understanding of surface and sub-surface features, the potential contaminant sources, transport pathways and receptors. In assessing the likely contaminants of concern present at the site, reference has also been made to Defra and Environment Agency supporting documentation. A preliminary qualitative risk assessment has also been made of the likelihood of the linkage operating and its potential significance in accordance with CIRIA C552.

The potential pollutant linkages identified and the qualitative risk assessment for these are presented in Table 7.1 below. The terms used in the preliminary qualitative risk assessment are defined in Appendix E.

7.1. Uncertainties

The following uncertainties exist in the preliminary conceptual model:

- The presence of any features unrecorded by the historic maps.
- Any unrecorded geological features.
- Any unrecorded pollution events during the site's history.



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Table 7.1 Preliminary Assessment of Potential Pollutant Linkages (Continued on Next Page).

Justification / Comments
• The site currently comprises an asphalt surfaced car park for Hopwood Hall College, with a drop off lane located in the north of the site and limited soft landscaped areas (grassed) present in the northwest, northeast, east (terraced levels) and southeast of the site. Hopwood Hall College is located in the east of the site, split over varying levels and with an undercroft maintenance/service area, within which oil tanks were noted to be present (one of which has been emptied but not decommissioned, the other of which is filled with heating oil but not used). An electric substation is present in the east of the site (to the west of the college building). A second smaller car park is located in the northwest of the site, although this area was not accessible during the ground investigation. The main car park is relatively level at 119m AOD, although a brick retaining wall of approx. 1.0m to 1.5m height separates the car park from the higher level of College Road at the northern site boundary, and a similar retaining wall separates the car park from the grassed banks of the River Roch in the south. • Historically the River Roch meandered through the centre of the site, with a weir present close to the centre west of the site. Excavation/building up/stockpiling of materials is shown on its northwestern bank at several points in history. The remainder of the site has historically been occupied by a large mill (including a pump) in the east of the site, and several smaller mills and dyeworks (including a tank) in the west of the site at extending offsite beyond the site boundaries. Holland Street and presumed residential properties (which may have contained basements) were mapped in the northeastern corner of the site. By the 1960s the mill in the east of the site had been replaced with Rochdale Technical College, although some of the smaller mills/works were still shown in the northwest of the site at this time, alongside allotment gardens. By the late 1960s/early 1970s the River Roch had been diverted along the southern boundary of the site, with the former watercourse on site infilled. Embankments are shown along the watercourse at the southern site boundary, suggesting site levels may have been raised. Allotments and buildings in the northwest of the site were demolished during this time, with a large building labelled as Rochdale College now present across the majority of the west and centre of the site, and additional college buildings shown in the southeast of the site and an access road and car park created in the northwestern corner of the site. Holland Street was rerouted to the north of the site and renamed as Bury Street and later College Road, with the buildings alongside it demolished. The large college building in the west and centre of the site is last shown in 2008, by 2012 this and the smaller buildings in the southeast of the site have been demolished. The west/centre of the site was resurfaced for car parking (it is understood the concrete floor slab was left in situ beneath the asphalt) and the southeastern area was soft landscaped. • The immediate surrounding area predominantly comprised industrial/commercial land uses including mills and dyeworks, a cattle market, warehouses, unnamed works, with some terraced residential properties. The majority of the surrounding industry was demolished by the 1960s to 1980s, with an embankment and high rise residential constructed from 10m to the north of the site (potentially on built up land) and possible raising of levels shown in the former cattle market area approx. 20m east of the site during the 1970s. By 2000, the former cricket ground and industry to the south of the river was replaced with a supermarket and associated petrol station. • The previous third party investigation recorded the Made Ground deposits in CP02 at 5.30m bgl (northeast of the site) were stained black with a strong hydrocarbon odour. Asbestos (chrysotile fibres, amosite loose fibrous debris) was recorded in numerous locations within the Made Ground across the site, at concentrations of up to 0.003% w/w. No other contaminants were recorded in excess of public open space (park) assessment criteria. • An electric substation is recorded 94m W and a petrol station is recorded 106m SW of the site. Both are located hydraulically downgradient of the site and therefore are not likely to impact the site. • There are 2 no. licensed industrial processes located 176m E of the site, at Newhey Bleach works. These are for the pre-treating/dyeing fibres/ textiles and for coating/printing textiles. Both are recorded as superseded in 2024, and it is unclear whether these industrial processes are still occurring. There is also a recent industrial land use involving paints, varnishes and lacquers located 164m north. • Made Ground has been recorded to depths of between 0.95m and 6.80m bgl (the deeper Made Ground being recorded within the former infilled watercourse) within a previous third party ground investigation. Superficial Deposits comprising Alluvium (Secondary A aquifer) are recorded in the north of the site, with Glaciofluvial deposits (Secondary A aquifer) recorded across the remainder of the site. The solid geology is recorded as the Pennine Lower Coal Measures (Secondary A aquifer). • There are no Source Protection Zones, potable, non-potable or surface water abstractions recorded within 250m of the site. The nearest surface water feature is the River Roch located beyond the southern site boundary, with the River Spodden also located 209m southwest of the site. No further surface water features are located within 250m of the site. Groundwater flow is anticipated to be towards the southwest based on



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surrounding topography and the presence of the River Roch. There is understood to be limited surface water drainage in the form of ACO drains at the main car park perimeters, with an interceptor located in the northeast of the car park.

- A historical landfill is located 204m W, with no information on the waste accepted or any dates of operation given, although the Environment Agency have stated that it was infilled before 'controls imposed under the Control of Pollution Act 1974'.
- As well as a general presence of shallow Made Ground, a significant depth of infilled ground is present on site within the route of the former watercourse, recorded to a depth of 6.80m bgl in the previous third party investigation. Infilled Made Ground is likely to include organic rich materials. It is also likely that the site has been raised following the rerouting of the watercourse. Possible unrecorded shallow workings may also be present beneath the site. Land in the immediate surrounding vicinity has also possibly been infilled/built up in recent history.
- Less than 1% of properties are recorded to be above the Action Level for Radon, therefore no radon protection measures are required.
- A storm overflow sewage discharge consent to the River Roch is present on site (revoked 2020), and a pollution incident involving crude sewage released to the River Roch (Category 3 minor impact) has been recorded in July 2023. Neither is expected to have a lasting impact on the site.
- Whilst the Fire Service have recorded 3 no. fires to have occurred on the site, they have confirmed that PFAS containing firefighting foam was not used in any of the incidents. There are no records of the storage of petroleum spirits on the site.
- The site is not located within an ecologically sensitive area.



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Source	Potential Contaminants of Concern	Pathway	Receptor	Consequence	Probability	Qualitative Risk Assessment
Anticipated widespread Made Ground; Infilled former watercourse located through the centre of the site and possible raising of site levels; Residential properties in the northeast of the site that may have had basements infilled during demolition; Former cotton mills, dyeworks, mills, unspecified works, college, tanks and works located on site and in immediate vicinity Demolished college buildings in the centre west and southeast of the site;	Metals PAHs pH Hexavalent chromium Acids Alkalis	Direct contact, dust inhalation and ingestion	Future site users (commercial)	Medium	Likely	Moderate Risk
			Adjacent site users (residential and commercial)	Medium	Likely	Moderate Risk
			Construction, site investigation, demolition and future maintenance workers	Medium	High Likelihood	High Risk
		Migration of mobile contaminants from Made Ground soils to adjacent sites along services and conduits	Adjacent site users (residential and commercial)	Medium	Low Likelihood	Moderate / Low Risk
		Migration via water pipes	Future site users (commercial)	Medium	Likely	Moderate Risk
		Lateral and/or vertical migration of mobile contaminants.	Aquifer 1 - Secondary A Aquifer associated with Alluvium	Medium	Likely	Moderate Risk
			Aquifer 2 - Secondary A Aquifer associated with Glaciofluvial Deposits	Medium	Likely	Moderate Risk
			Aquifer 3 - Secondary A Aquifer associated with Pennine Lower Coal Measures	Medium	Likely	Moderate Risk
			River Roch located beyond southwestern boundary	Medium	High Likelihood	High Risk
	Naphthalene (a semi-volatile PAH) TPH / BTEX / MTBE VOCs / SVOCs Phenols PolyChlorinated Biphenyls (PCBs) Cyanides Glycols Free phase product	Vapour inhalation, direct contact, dust inhalation and ingestion	Future site users (commercial)	Medium	Likely	Moderate Risk
			Adjacent site users (residential and commercial)	Medium	Low Likelihood	Moderate / Low Risk
			Construction, site investigation, demolition and future maintenance workers	Medium	High Likelihood	High Risk
		Migration of mobile contaminants from Made Ground soils to adjacent sites along services and conduits	Adjacent site users (residential and commercial)	Medium	Low Likelihood	Moderate / Low Risk
		Migration via water pipes	Future site users (commercial)	Medium	Likely	Moderate Risk
		Lateral and/or vertical migration of mobile contaminants.	Aquifer 1 - Secondary A Aquifer associated with Alluvium	Medium	Likely	Moderate Risk
			Aquifer 2 - Secondary A Aquifer associated with Glaciofluvial Deposits	Medium	Likely	Moderate Risk
			Aquifer 3 - Secondary A Aquifer associated with Pennine Lower Coal Measures	Medium	Likely	Moderate Risk
			River Roch located beyond southwestern boundary	Medium	High Likelihood	High Risk
	Asbestos	(Dust migration and) dust inhalation	Future site users (commercial)	Medium	Likely	Moderate Risk
			Adjacent site users (residential and commercial)	Medium	Low Likelihood	Moderate / Low Risk
			Construction, site investigation, demolition and future maintenance workers	Medium	High Likelihood	High Risk
Current use of the majority of the site as a car park Below ground storage tanks in the southeastern part of the existing college building Interceptor located in the northeast of the car park area Black stained material with hydrocarbon odour recorded in the northeast of the site within the previous third party ground investigation	Naphthalene (a semi-volatile PAH) TPH / BTEX / MTBE Glycols Free phase product	Vapour inhalation, direct contact, dust inhalation and ingestion	Future site users (commercial)	Medium	Likely	Moderate Risk
			Adjacent site users (residential and commercial)	Medium	Low Likelihood	Moderate / Low Risk
			Construction, site investigation, demolition and future maintenance workers	Medium	High Likelihood	High Risk
		Migration of mobile contaminants from Made Ground soils to adjacent sites along services and conduits	Adjacent site users (residential and commercial)	Medium	Low Likelihood	Moderate / Low Risk
		Migration via water pipes	Future site users (commercial)	Medium	Likely	Moderate Risk
		Lateral and/or vertical migration of mobile contaminants.	Aquifer 1 - Secondary A Aquifer associated with Alluvium	Medium	Likely	Moderate Risk
			Aquifer 2 - Secondary A Aquifer associated with Glaciofluvial Deposits	Medium	Likely	Moderate Risk
			Aquifer 3 - Secondary A Aquifer associated with Pennine Lower Coal Measures	Medium	Likely	Moderate Risk
			River Roch located beyond southwestern boundary	Medium	High Likelihood	High Risk
Asphalt surfacing (if crushed and re-used)	Coal tar	Vapour inhalation, direct contact, dust inhalation and ingestion	Future site users (commercial)	Medium	Likely	Moderate Risk
			Adjacent site users (residential and commercial)	Medium	Low Likelihood	Moderate / Low Risk
			Construction, site investigation, demolition and future maintenance workers	Medium	High Likelihood	High Risk
		Migration of mobile contaminants from Made Ground soils to adjacent sites along services and conduits	Adjacent site users (residential and commercial)	Medium	Low Likelihood	Moderate / Low Risk
		Migration via water pipes	Future site users (commercial)	Medium	Likely	Moderate Risk
		Lateral and/or vertical migration of mobile contaminants.	Aquifer 1 - Secondary A Aquifer associated with Alluvium	Medium	Likely	Moderate Risk



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Source	Potential Contaminants of Concern	Pathway	Receptor	Consequence	Probability	Qualitative Risk Assessment
			Aquifer 2 - Secondary A Aquifer associated with Glaciofluvial Deposits	Medium	Likely	Moderate Risk
			Aquifer 3 - Secondary A Aquifer associated with Pennine Lower Coal Measures	Medium	Likely	Moderate Risk
			River Roch located beyond southwestern boundary	Medium	High Likelihood	High Risk
Electricity substation present in the east of the site and 94m W	PolyChlorinated Biphenyls (PCBs)	Vapour inhalation, direct contact, dust inhalation and ingestion	Future site users (commercial)	Medium	Likely	Moderate Risk
			Adjacent site users (residential and commercial)	Medium	Low Likelihood	Moderate / Low Risk
			Construction, site investigation, demolition and future maintenance workers	Medium	High Likelihood	High Risk
		Migration of mobile contaminants from Made Ground soils to adjacent sites along services and conduits	Adjacent site users (residential and commercial)	Medium	Low Likelihood	Moderate / Low Risk
		Migration via water pipes	Future site users (commercial)	Medium	Likely	Moderate Risk
		Lateral and/or vertical migration of mobile contaminants.	Aquifer 1 - Secondary A Aquifer associated with Alluvium	Medium	Likely	Moderate Risk
			Aquifer 2 - Secondary A Aquifer associated with Glaciofluvial Deposits	Medium	Likely	Moderate Risk
			Aquifer 3 - Secondary A Aquifer associated with Pennine Lower Coal Measures	Medium	Likely	Moderate Risk
			River Roch located beyond southwestern boundary	Medium	High Likelihood	High Risk
Previously recorded widespread asbestos within Made Ground (chrysotile fibres, amosite loose fibrous debris, at concentrations of up to 0.003% w/w)	Asbestos	(Dust migration and) dust inhalation	Future site users (commercial)	Severe	High Likelihood	Very High Risk
			Adjacent site users (residential and commercial)	Severe	High Likelihood	Very High Risk
			Construction, site investigation, demolition and future maintenance workers	Severe	High Likelihood	Very High Risk
Made Ground located beneath the site, including to a significant depth within the route of the former watercourse and possible infilled basements of residential properties in the northeast. Possible organic rich deposits associated with former watercourse. Alluvium beneath the site. Coal measures located beneath the site, including possible unrecorded shallow workings. Numerous possible infilled features and raising of levels in the close surrounding area. Historical landfill 204m W of the site.	Hazardous ground gasses (methane, carbon dioxide, hydrogen sulphide, carbon monoxide and depleted oxygen)	Inhalation (indoor and outdoor)	Future site users (commercial)	Severe	Likely	High Risk
			Adjacent site users (residential and commercial)	Severe	Likely	High Risk
			Construction, site investigation, demolition and future maintenance workers	Severe	Likely	High Risk
		Migration of hazardous ground gases from beneath the site to adjacent sites along services or other preferential conduits	Adjacent site users (residential and commercial)	Severe	Likely	High Risk
		Migration of ground gas / explosion	Buildings and services	Severe	Likely	High Risk

For definition of the terms used in the qualitative risk assessment, please see Appendix E.



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8. PROPOSED FURTHER WORKS

8.1. Further works

The Phase 1 Preliminary Risk Assessment has determined a moderate to very high risk to human health and a moderate to high risk to controlled waters at the site with respect to potential contamination and hazardous ground gases.

It is recommended that a ground investigation is undertaken in order to further assess the potential risks associated with the pollutant linkages identified in the Preliminary Conceptual Site Model (presented in Section 6).

The objectives of the Phase II Ground Investigation will be:

- to determine shallow soil and groundwater (if encountered) conditions, including whether significant contamination has resulted from past or current land uses;
- to determine deeper soil/bedrock and groundwater (if encountered) conditions, including to investigate the potential for shallow unrecorded coal mining and whether significant contamination has resulted from past or current land uses;
- to determine the risks posed by any ground contamination and provide recommendations on remedial measures to manage such risks;
- to determine the risks posed to the site from hazardous ground gases;
- to determine the existence, and if applicable, the extent of contamination within local groundwater beneath the site;
- to provide advice relating to geotechnical issues associated with the site.

8.2. Proposed Scope of Works

The following scope of works are proposed

- Trial pitting within 1 no. soft landscaped area to investigate shallow ground conditions and enable the performance of soak away testing, and falling head testing within boreholes elsewhere on site to enable infiltration testing.
- Window sample drilling and installation of shallow monitoring wells for gas and groundwater (if encountered) monitoring purposes and to facilitate soil sampling for environmental and geotechnical testing.
- In situ geotechnical testing to assist with foundation design and recommendations;
- Geoenvironmental chemical testing on selected soil samples for metals, pH, speciated PAH, speciated TPH, phenol, SVOC/SVOC, PCBs, glycol, sulphate, TOC and asbestos screens in order to assess potential risks to human health based on historical land uses on and within close proximity to the site and to assist with basic waste characterisation.
- Geoenvironmental chemical testing on selected asphalt samples to assess the potential risk to human health from coal tar potentially present within the exiting asphalt surfacing across site.
- The Control of Asbestos Regulations 2012 should be adhered to. A summary of complying with CAR: risk assessments, licensing and training is provided in Appendix G.



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9. REGULATORY APPROVALS

The conclusions and recommendations presented above are considered reasonable based on the findings of the site investigation. However, these cannot be guaranteed to gain regulatory approval and, therefore, the report should be passed to the appropriate regulatory authorities and/or other organisations for their comment and approval prior to undertaking any works on site.

It is recommended that conditions placed on any planning permission are discharged prior to commencement of site works.



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11.GLOSSARY OF TERMS

ACEC	Aggressive Chemical Environment for Concrete (classification)
aOD	Above Ordnance Datum
bgl	Below ground level
BGS	British Geological Survey
BRE	Building Research Establishment
CBR	California Bearing Ratio (test)
COMAH	Control of Major Accident Hazards (regulations)
Designated location	Site (and the ecosystem on that site) protected under national or international legislation. A potential ecological receptor to be considered as part of the assessment of land contamination. Example designated locations include SSSIs (q.v.), SACs (q.v.), national nature reserves, Ramsar sites and bird special protection areas.
DQA	Data Quality Assessment
DQO	Data Quality Objective
DQRA	Detailed Quantitative Risk Assessment
DWS	Drinking Water Standard
EQS	Environmental Quality Standard
GAC	Generic Assessment Criterion
GQA	General Quality Assessment (Environment Agency)
GSV	Gas Screening Value
HCV	Health Criteria Value
IPPC	Integrated Pollution Prevention and Control (regulations)
K _{ow}	Octanol-water partition coefficient
LEL	Lower Explosive Limit
LL	Liquid Limit
LoD	Limit of Detection (analytical)
LoQ	Limit of Quantification (analytical)
Mean Value Test	Statistical test (described in the CIEH Guidance) to estimate the mean value of a normally distributed population of data at a given level of confidence. Normally for contaminated land assessment, the 95th percentile (referred to as the 95%UCL or US95) is applied as a reasonable but conservative estimate of the mean concentration for comparison with the relevant assessment criteria.
Maximum Value Test	Statistical test (described in the CIEH Guidance) to identify whether an elevated concentration within a normally distributed data set forms part of the underlying population from which it has been sampled or whether it is an outlier (such as a localised area of contamination) that merits further consideration.
MC	Moisture Content
NGR	National Grid Reference
NIHHS	Notification of Installations Handling Hazardous Substances (regulations)
OS	Ordnance Survey
PI	Plasticity Index
PID	Photoionisation Detector
PL	Plastic Limit
ppm	Parts per million
ppmv	Parts per million by volume
QA	Quality Assurance
QC	Quality Control



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SAC	Special Area of Conservation
SOM	Soil Organic Matter
SPT	Standard Penetration Test
SPZ	Source Protection Zone (see Appendix F)
SSAC	Site-Specific Assessment Criterion
SSSI	Site of Special Scientific Interest
SVOC	Semi-Volatile Organic Compound
TEF	Toxicity Equivalent Factor
TPH	Total Petroleum Hydrocarbons
TWA	Time Weighted Average
US95	95 th percentile estimate of the true mean value of a data population (also known as 95%UCL).
VOC	Volatile Organic Compound

APPENDIX A - DRAWINGS

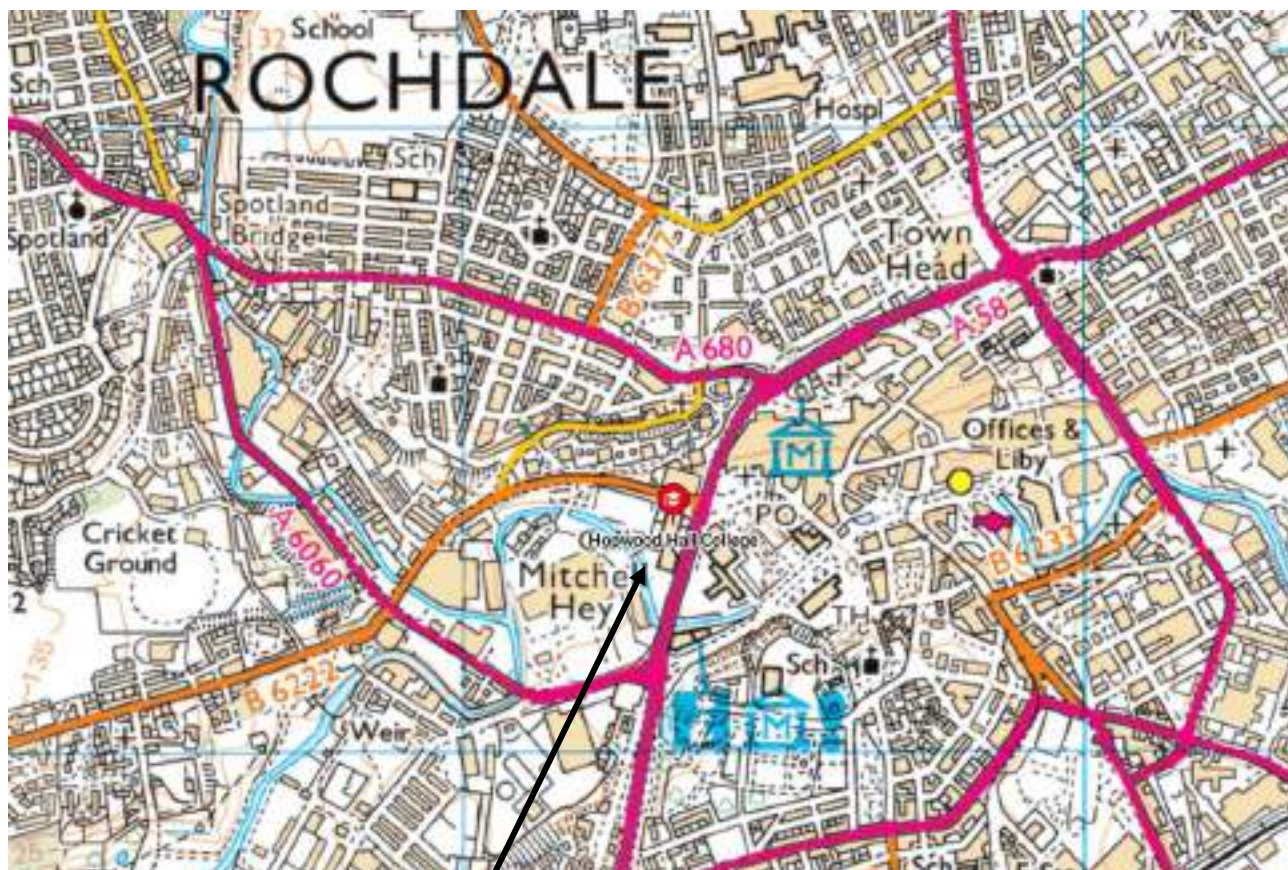


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Contract: Hopwood Hall College, Rochdale

Client: Wilmott Dixon Construction

Site Location Plan



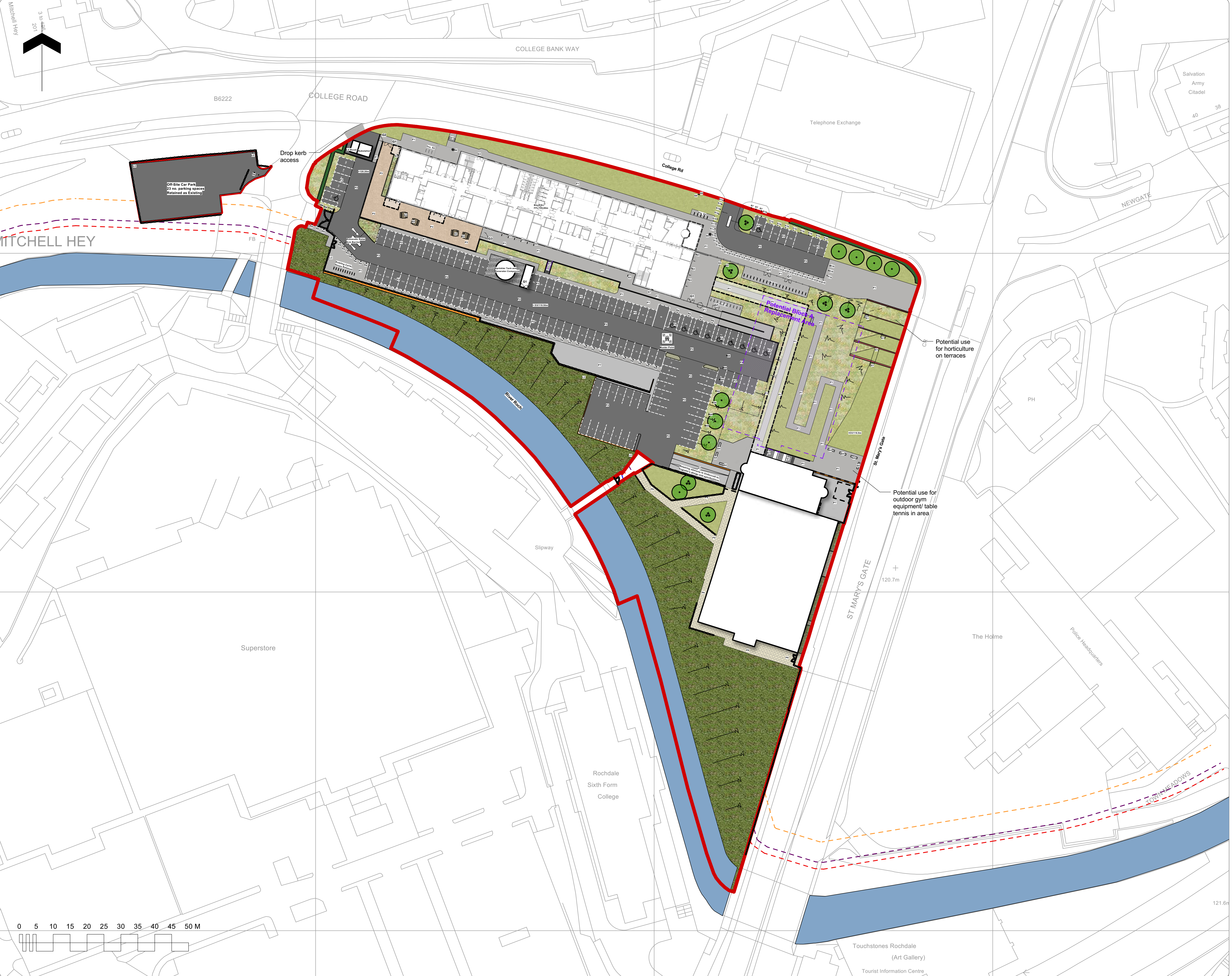
Site

Scale NTS

Drawn by SE

Approved AR

Drawing Number
TE1880-TE-00-XX-DR-GE-001-V01



1. Do not scale from this drawing
2. To be read in conjunction with Project Risk Register REF: XXX
3. To be read in conjunction with all other Landscape Architect's drawings

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RESIDUAL PROJECT RISKS

DATE	REV	DESCRIPTION OF REVISION	DRAWN BY	APPROVED BY
REVISIONS				

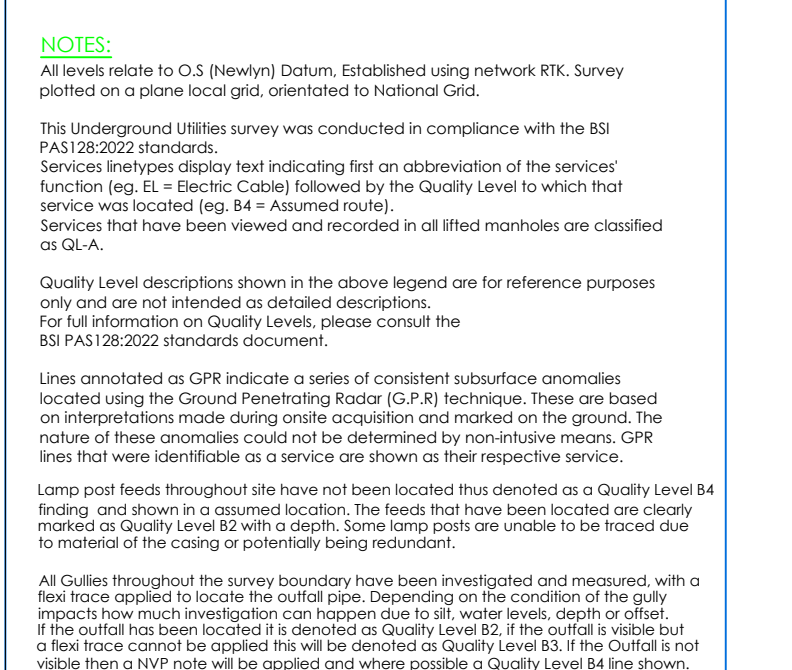
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PROJECT TITLE :
Hopwood Hall College

DRAWING SCALE :	DRAWN BY :	DRAWN DATE :
1:500	LS	22/10/202
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FE0012-ALA-ZZ-ZZ-D-L-9019 S2



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