



PRELIMINARY RISK ASSESSMENT REPORT FOR MOSS NOOK, HEALD GREEN, MANCHESTER

TE1604-TE-00-XX-RP-GE-001-V01

VERSION 1.0

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FINAL

Prepared for:

Northern Powerhouse Land Ltd

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EXECUTIVE SUMMARY

Introduction	Tier Environmental was commissioned by Norther Powerhouse Land Ltd to undertake a desk study and Phase I Preliminary Risk Assessment of the proposed commercial / industrial development at Moss Nook, Heald Green. 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	Under current proposals the development will comprise 4 No. warehouse structures/commercial units of ground floor and mezzanine for a total of 1,396m ² floor space, with associated infrastructure, parking and localised soft landscaping at the end of parking bays.
Site location and surrounding land uses	The site is located at Moss Nook, Heald Green, Manchester, M22 5LS within a mixed commercial and residential area. Manchester Airport lies approximately 1km to the south west of the Site, with the surrounding area between the airport and the Site predominantly occupied with associated car parks, hotels and other businesses. A railway line, and Heald Green station, are located approximately 200m to the east of the Site, beyond which the surrounding land use is mainly residential.
Site history	The site is recorded undeveloped agricultural land from 1872, with a tree lined brook on the northern and western site boundaries. By the early 2000s, a road entrance in the southern corner of the Site has been created alongside a development immediately east of the Site. Aerial imagery indicates the Site was used as a temporary compound for site cabins and materials associated with this development. Historically the wider site area is predominantly undeveloped land or small scale residential. A railway is located 50m east by 1935.
Geology, Hydrogeology and Hydrology	The site is underlain by geology of Glacial Till (Secondary Undifferentiated Aquifer) overlying the Sherwood Sandstone Group (Principal Aquifer). Tier Environmental logs recorded the site to be underlain by Made Ground to between 0.20-0.60m bgl comprising sandy gravelly Clays with mudstone, limestone and brick and natural soils comprised of medium to very high strength, low plasticity cohesive Glacial Till to the maximum drilled depths of 10.05m bgl. The nearest surface water feature is Gately Brook located 40m northeast of the site boundary. The site is not within a Source Protection Zone and there are no potable abstraction records.
Ground Gases	The Tier 2012 investigation assessed the site as a Characteristic Situation 1 – Very Low Risk.
Radon Requirements	Basic radon protection measures are not currently required for the proposed development on this Site.
Potential contaminative features	No distinct potentially contaminative features have been recorded aside from locally asbestos impacted soils within the north of the site.
Mining and quarrying	The Site is not located within a mining area or an area subject to historic quarrying.
Previous investigations	Tier Environmental completed a ground investigation in April 2012 which comprised drilling of 3 No. Cable Percussive holes; (BH1 to BH3) to a depth of 10.05m bgl, and excavation of 20 No. trial pits (TP1 to TP20) to depths of between 1.20m bgl (TP18) and 4.00m bgl (TP10). A subsequent visit took place in June 2016 comprising 16 No. trial pits within the asbestos impacted area. Upon comparison of soil chemical results against GACs for a commercial/industrial site land use, Tier recorded no exceedances indicating an unlikely risk to current and future site users. 1 No. sample (TP3 at 0.25m bgl) was identified as containing asbestos (chrysotile fibres) during the initial investigation and a second detection of chrysotile fibres was recorded in the Tier 2016 investigation, reported to be <0.001% w/w.
Unexploded Ordnance	A preliminary review has determined the site be within a medium risk area and a detailed desk study should be completed.
Waste Soils Classification	With the exception of the asbestos impacted soils in the north of the site, all soils are considered likely to be suitable as inert waste. Some of the asbestos impacted soils are likely to be classified as hazardous waste.
Materials re-use	Subject to volumetric fill requirements and a future assessment of suitability of re-use (both chemically and geotechnically), some materials <i>may</i> 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).
Further works	Supplementary ground investigations works would comprise: 1 No. days trial pitting (approximately 8 No. trial pits) to determine the nature and extent of Made Ground and natural deposits across the Site, facilitate soil sampling for environmental and geotechnical testing. 1 No. day window sample drilling (approximately 5 No. locations) and installation of 5 No. monitoring wells for gas and groundwater (if encountered) monitoring purposes and to facilitate soil sampling for environmental and geotechnical testing.



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1. INTRODUCTION

Tier Environmental was commissioned by Tier Consult on behalf of Northern Powerhouse Land Ltd to undertake a Land Contamination Risk Management (LCRM) Preliminary Risk Assessment for an area of land referred to as Moss Nook, located at Heald Green, Manchester, M22 5LS (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 4 No. warehouse structures/commercial units of ground floor and mezzanine for a total of 1,396m² floor space, with associated infrastructure, parking and localised soft landscaping at the end of parking bays, 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 / Industrial.

1.2. Previous Reports

Tier Environmental have previously completed the following reports for the site:

- A Geoenvironmental Appraisal of Land at Moss Nook, Heald Green, by Tier Environmental (Ref: T/12/1105/GA v 1.1, dated September 2012)
- A Remediation Strategy for Land at Moss Nook, Heald Green, by Tier Environmental (Ref: T/12/1105/RS, dated June 2012)
- An Asbestos Assessment for Land at Moss Nook, Heald Green, by Tier Environmental (REF: T/12/1105/GA/L01, dated July 2016)

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 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 assume *typically* between ground level to circa 5.00m below ground level (bgl) for 'shallow' and greater than 5.00m bgl regarded as 'deep';
- The comments and opinions presented in this report are based on the findings of the desk study, and a review of previous Tier Environmental reports inclusive of ground conditions encountered during previous intrusive investigation works performed by Tier Environmental. 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	Moss Nook, Heald Green
Site address	Moss Nook, Heald Green, Manchester, M22 5LS. A site location plan is included as Drawing No. TE1604-TE-XX-DR-GE-001-V01 within Appendix A
National Grid Reference (NGR)	384218 385901
Approximate Site area	0.42 ha
Site shape	The Site is irregular in shape
Current land use on the Site	The Site currently comprises unoccupied scrubland. There are no existing structures or areas of hardstanding. Access is afforded by a road from the south east; the site is fenced along its perimeter. A mound of material is located in the centre of the site. Underground service drawings have not been provided to Tier Environmental; however, there remains a potential for such features to be present beneath the Site.
Surrounding land uses	The site is set within a mixed commercial and residential area. Manchester Airport lies approximately 1km to the south west of the Site, with the surrounding area between the airport and the Site predominantly occupied with associated car parks, hotels and other businesses. A railway line, and Heald Green station, are located approximately 200m to the east of the Site, beyond which the surrounding land use is mainly residential.
General topography and ground levels	The Site and surrounding area are understood to be relatively flat, at approximately 67m AOD.

An aerial photograph (from the Groundsure report) of the Site and site boundary is shown below. Relevant Site photographs are presented in Appendix B.



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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 1872 to 2021 were reviewed. These were obtained as part of the Groundsure report for the Site, which is presented in Appendix C.

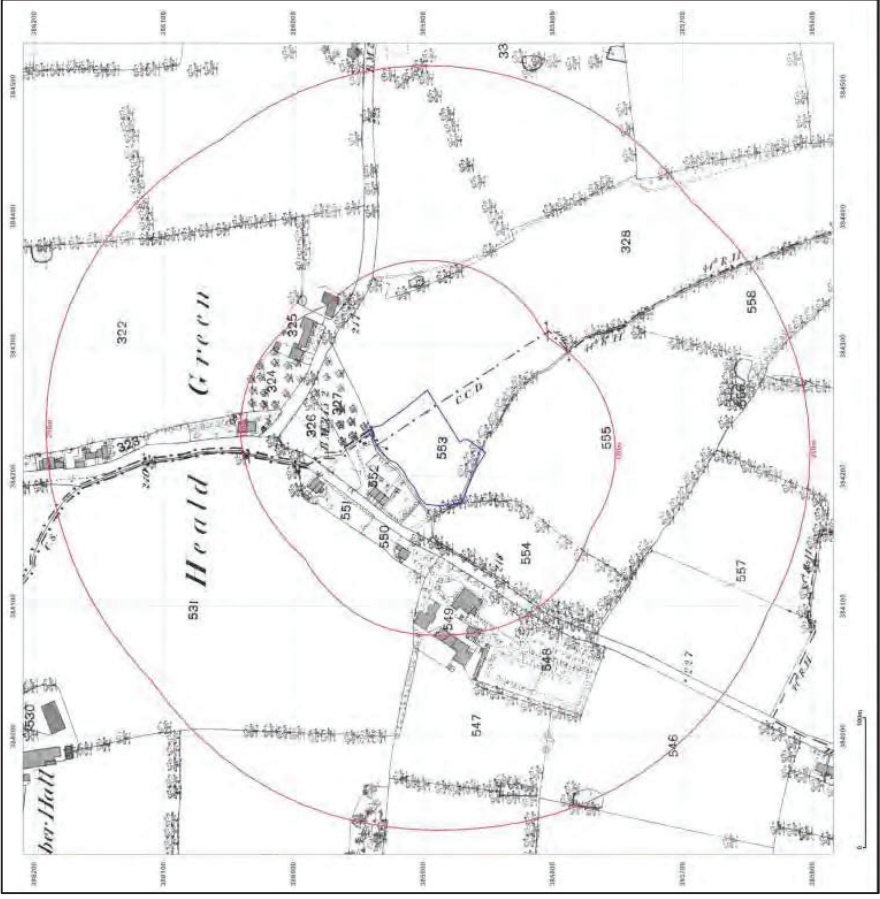
Table 3.1 below presents a summary of the main aspects of the Site relevant to the current and proposed future end uses. It is not the intention of this report to describe in detail all of the changes that have occurred on or adjacent to the Site, where these are not relevant to the land use.



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Table 3.1 Site History.

Time Period	On-Site features	Off-Site features
Pre-1900		
	Site is undeveloped, with a tree lined watercourse at the north western, western and south western boundaries	- Area is predominantly residential and open/farm land - Numerous ponds present in the surrounding area, the closest of which is located approximately 95m east of the site



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Time Period	On-Site features	Off-Site features
1900 to 1945 (Pre-war and World War II period)		1907 • A railway cutting/embankment is shown to be under construction approximately 50m east of the Site, trending approximately north to south. It is presumed that the pond previously located in this area has been infilled/excavated during these works • By 1935-1938 the railway and station are shown to have been completed, and a residential development is under construction immediately adjacent to the east of the railway line (approximately 105m east of the Site)



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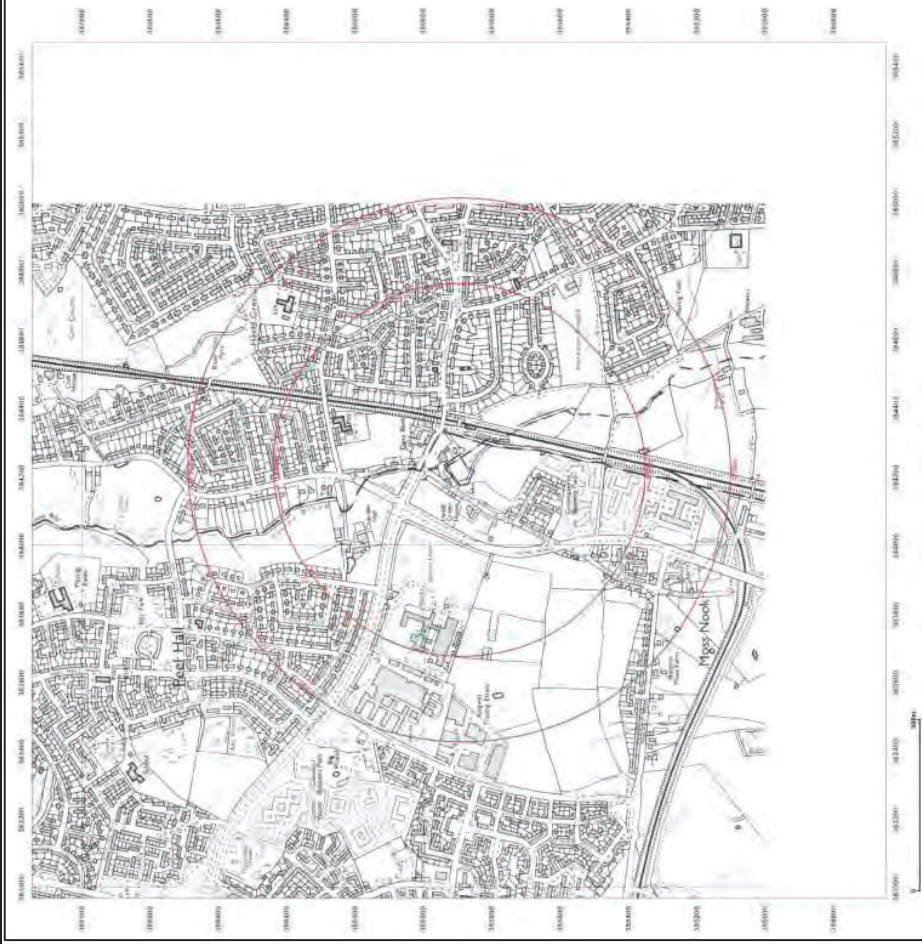
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Time Period	On-Site features	Off-Site features
1945-1980 (Post war period)		
	The watercourse on the northern Site boundary is named as Gately Brook and as a drain along the southern boundary	1972 – 1973 - The Heald Green Hotel has been constructed immediately beyond the north eastern boundary - A coal yard associated with the railway is located approximately 65m to the south east - Stylal Drive has been constructed approximately 120m west - A nursery is present 220m south west - An unspecified works is present 380m west - Residential development has continued within the wider surrounding area



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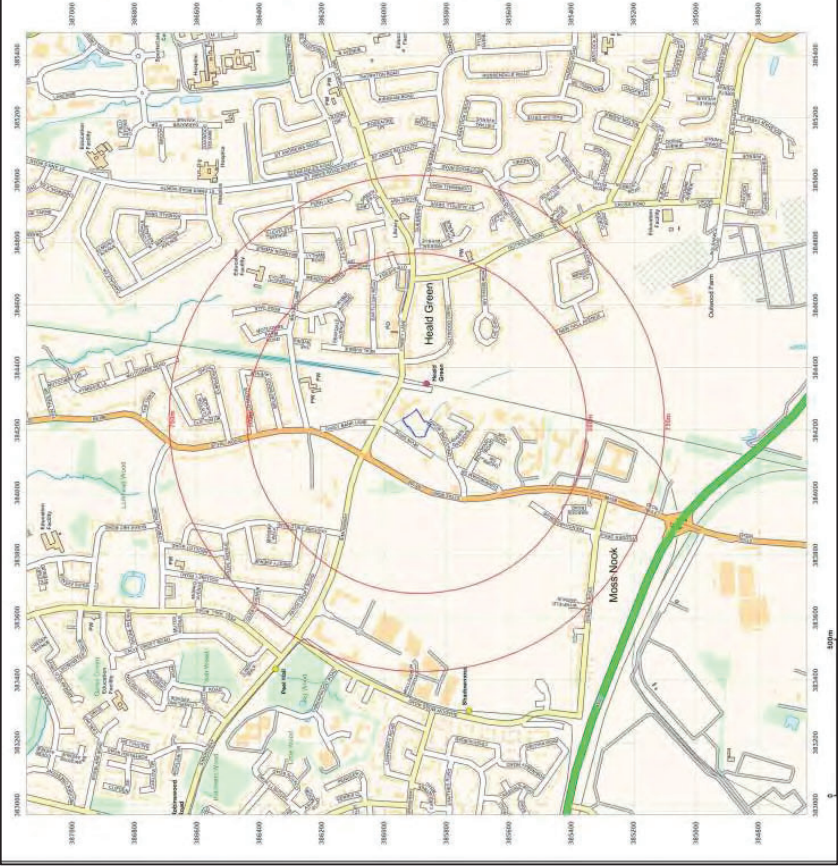
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Time Period	On-Site features	Off-Site features
1980 – 2000 (Late 20th century period)		
	• No significant change	1995 • Both residential and commercial development continues in the surrounding area, with residential development reaching to within 150m south of the Site • The coal yard shown 65m south east of the Site is now shown as garages and a depot



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Time Period	On-Site features	Off-Site features
2000 to 2021 (Modern day period)		
	A road entrance in the southern corner of the Site has been created alongside the development immediately to the east of the Site. It is understood from aerial imagery that during this development, the Site was used as a temporary compound for site cabins and materials associated with the development beyond the eastern boundary	2021 Aerial photography dated 2009 shows commercial development to reach the southern site boundary, and the eastern boundary by 2016



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3.2. Preliminary Unexploded Ordnance Risk Assessment

The Site and immediate surrounding area remained largely undeveloped at the time of World War II, however the wider Manchester area was a target during the German bombing raids. In addition, various news reports online have reported UXO finds in the surrounding Heald Green area.

The Site lies in a moderate risk area from UXO according to Zetica risk maps. Therefore, and in line with CIRIA C681: Unexploded ordnance (UXO) A guide for the construction industry, a preliminary UXO risk assessment should be 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	Manchester is recorded to have had 3 major attacks (where 100 tonnes or more of high explosive bombs were dropped), and numerous smaller air raids. Infrastructure such as railways was particularly targeted. (Imperial War Museum, https://www.iwm.org.uk/history/the-manchester-blitz)
Could the site have been a high-risk target?	Yes	The nearby train station would have been a priority target for the Luftwaffe.
Any development cycles since 1945?	No	
Mitigating Factors		e.g. Potential for shallow bedrock which would reduce the depth of a UXO. But localised quarries and deep made ground could increase the depth of a UXO.
Preliminary assessment of UXO Risk	Medium	The site is potentially at risk from UXO, with numerous finds reported in the surrounding area
Further works?	Yes	Detailed UXO Risk assessment recommended



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4. ENVIRONMENTAL SETTING

4.1. Geology

Table 4.1 Geological Summary.

Maps and publications referenced	Groundsure, Tier Environmental Report T/12/1105/GA v 1.1.
Made ground / artificial ground	The Site isn't shown to be located within an area of artificial ground according to the Groundsure report. Given the history of development on the Site, the presence of a significant depth of Made Ground is not anticipated. A historic Tier Environmental report recorded Made Ground of sandy/gravelly Clays to depths of between 0.20-0.60m bgl. Recent aerial photography shows a compound containing site cabins and materials storage on site or the adjacent development beyond the eastern boundary. Therefore, localised Made Ground may be present at the surface, likely consisting of gravel/hardstanding
Drift geology	Glacial Till, Devensian. Tier Environmental report T/12/1105/GA v 1.1 recorded these soils to a maximum drilled depth of 10.05m bgl.
Solid geology	Helsby Sandstone Formation of pebbly (gravelly) sandstone
Dip of solid strata	Not determined
Faults	A fault line is indicated to be present 191m west of the Site, trending north to south
Coal seams	None shown to outcrop or subcrop on or in the immediate vicinity of the Site.

4.2. Mining and Quarrying

Table 4.2 Coal Mining Activities.

	Yes/No	Comments
Is the Site in an area of potential shallow coal workings?	No	
Is the Site in a high risk development area?	No	
Are there any known shafts, adits, tips, lagoons, or opencast workings likely to affect the Site?	No	
Is exploratory work required to investigate the potential risk from shallow mining or quarrying?	No	



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Table 4.3 Other Extractive Industries.

	Yes/No	Comments
Superficial drift deposits		
Evidence of extraction on or within 250 m of the Site?	Yes	Cutting for railway located between 50m east and 103m east, between 1907 and 1938
Action required?	No	Further surface ground workings have not been recorded since 1938, therefore it is considered likely the recorded surface ground workings were associated with the railway construction rather than extractive industries
Solid Strata		
Any evidence of mineral extraction on or within 250 m of the Site?	No	
Action required?	No	

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

4.3. Hydrogeology

Table 4.4 Groundwater Occurrence and Abstraction.

	Presence/location	Comments
Environment Agency aquifer designation – Superficial Deposits	On site	Glacial Till: Secondary Undifferentiated
Environment Agency aquifer designation – Bedrock	On site	Helsby Sandstone: Principal Aquifer
Groundwater vulnerability	On site	Low vulnerability
Anticipated groundwater depth(s)	On site	Perched groundwater was recorded in the tier 2012 investigation at circa 0.15-0.30m bgl. Surface waters including Gately Brook and a drain at the site boundaries, and numerous ponds in the surrounding area, suggest shallow water.
Direction of flow		Anticipated to be West/North towards River Mersey
Current licensed abstractions – potable	None within 1km of the Site	
Current licensed abstractions – non-potable	None within 1km of the Site	
Private wells	95m west of the Site	Well indicated within a farmyard in an early historic map. It is presumed this feature is no longer active
Source Protection Zones	None within 500m of the Site	
Springs	None within close vicinity of the Site	

NR - none recorded.

For definition of Source Protection Zones, see Appendix F.



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4.4. Hydrology

Table 4.5 Surface Water Features.

	Presence/location	Comments
Nearest surface water feature	On site	Gately Brook is present at the north western site boundary, and a drain is present at the western and southern boundaries. the Groundsure also records an underground inland river to be present at the southern boundary, suggesting part of the drain may be culverted
Other surface water features	None	
Canals, ponds, lakes, etc.	Several ponds are present within 250m of the Site on historic maps, the closest of which was located 65m east	Closest pond presumed to have been infilled/excavated as the railway cutting intersects its location
Water Framework Directive (WFD) Surface Water Bodies	280m north	River Mersey (upstream of Manchester Ship Canal). Overall rating: Moderate Chemical rating: Good Ecological rating: Moderate
Licensed surface water abstractions	None within 250m	
Surface run-off and Site drainage		The full nature and extent of underground drainage system is unknown at this stage. As the site has remained undeveloped, buried drainage systems are not anticipated. Two small water courses/'drain' features are labelled along the northern/southern boundaries. The site comprises soft landscaping and precipitation is freely able to infiltrate through the surface.

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

4.5. Flood Risk Summary

Table 4.6 below represents a summary of the flood risk data contained within the Groundsure report obtained for the Site.

Table 4.6 Flood Risk Summary

	Presence/location	Comments
Risk of Flooding from Rivers and Sea (RoFRaS)	None within 50m	
Historical Flood Events	None within 250m	
Flood Defences	None within 250m	
Areas Benefiting from Flood Defences	None within 250m	
Flood Storage Areas	None within 250m	
Records of Flood Zone 2	None within 50m	
Records of Flood Zone 3	None within 50m	
Surface water flooding	On site and within 50m	Highest risk is 1 in 30 year, 0.3m – 1.0m
Groundwater flooding	On site and within 50m	Low risk

NR - none recorded



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4.6. Environmental Designations

Table 4.7 Summary of Environmental Designations.

	Presence/location	Comments
Sites of Special Scientific Interest (SSSI)	None within 2000m	
Conserved wetland sites (Ramsar sites)	None within 2000m	
Special Areas of Conservation (SAC)	None within 2000m	
Special Protection Areas (SPA)	None within 2000m	
National Nature Reserves (NNR)	None within 2000m	
Local Nature Reserves (LNR)	None within 2000m	
Designated Ancient Woodland	None within 2000m	
Biosphere Reserves	None within 2000m	
Forest Parks	None within 2000m	
Marine Conservation Zones	None within 2000m	
Green Belt	65m north east, 90m north and 90m south east	Stockport, Manchester and Stockport respectively
Proposed Ramsar sites	None within 2000m	
Possible Special Areas of Conservation (pSAC)	None within 2000m	
Potential Special Protection Areas (pSPA)	None within 2000m	
Nitrate Sensitive Areas	None within 2000m	
Nitrate Vulnerable Zones	None within 2000m	
SSSI Units	None within 2000m	

NR - none recorded



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4.7. Landfill and Waste Management Activity

Table 4.8 Waste Management Activities.

	Presence/location	Comments
Active or recent landfill	None within 500m	
Historical landfill (BGS records)	None within 500m	
Historical landfill (LA/mapping records)	None within 500m	
Historical landfill (EA/NRW records)	None within 500m	
Historical waste sites	None within 500m	
Licensed waste sites	None within 500m	
Waste exemptions	None within 250m	
Evidence of other landfilling or potential infilling on or within 250m of Site	Several ponds are present within 250m of the Site on historic maps, the closest of which was located 65m east	Closest pond presumed to have been infilled/excavated as the railway cutting intersects its location.
Walkover evidence of fly-tipping on Site?	On Site	A grassed over stockpile was recorded within the centre of the site during the Tier 2012 investigation.
Is a landfill/ground gas risk assessment required?	Yes	Potential ground gas risk remains from off-site Made Ground.

NR - none recorded

4.8. Local Industrial Land Uses

Other potentially contaminative activities are shown in Table 4.9 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 4.9 Other Potentially Contaminative Processes in the Locality

	Location	Comments
Recent industrial land uses	50m south 65m south west 80m south east 248m south west	Industrial Engineers Substation Vehicle Repair and Servicing Garage Vehicle Repair and Servicing Garage
Current or recent petrol stations	None within 500m	
Electricity cables	None within 500m	
Gas pipelines	None within 500m	
Sites determined as Contaminated Land	None within 500m	
Control of Major Accident Hazards (COMAH)	None within 500m	
Regulated explosive sites	None within 500m	
Hazardous substance storage/usage	None within 500m	



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	Location	Comments
Historical licensed industrial activities (IPC)	None within 500m	
Licensed industrial activities (Part A(1))	None within 500m	
Licensed pollutant release (Part A(2)/B)	None within 250m	
Radioactive Substance Authorisations	None within 500m	
Licensed Discharges to controlled waters	None within 250m	
Pollutant release to surface waters (Red List)	None within 250m	
Pollutant release to public sewer	None within 250m	
List 1 Dangerous Substances	None within 250m	
List 2 Dangerous Substances	None within 250m	
Pollution Incidents (EA/NRW)	None within 250m	
Pollution inventory substances	None within 250m	
Pollution inventory waste transfers	None within 250m	
Pollution inventory radioactive waste	None within 250m	

NR - none recorded

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

4.9. Radon Risk

Table 4.10 Radon Risk Status.

	Comments
Estimated properties affected	Less than 1% of properties above the Action Level
Radon Protection Measures required?	No

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.

Based on the history of the Site and the anticipated potential contaminants of concern, it is considered unlikely 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



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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).



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5. PREVIOUS INVESTIGATION FINDINGS

The following previous desk study or site investigation reports pertaining to this Site have been produced by Tier Environmental:

- A Geoenvironmental Appraisal of Land at Moss Nook, Heald Green, by Tier Environmental (Ref: T/12/1105/GA v 1.1, dated September 2012)
- A Remediation Strategy for Land at Moss Nook, Heald Green, by Tier Environmental (Ref: T/12/1105/RS, dated June 2012)
- An Asbestos Assessment for Land at Moss Nook, Heald Green, by Tier Environmental (REF: T/12/1105/GA/L01, dated July 2016)

Table 5.1 Report Review Summary

Site history	The site has been shown to have had a very limited development history, with a glass house on the north eastern boundary of the site that has since been demolished.
Potential contaminative features identified	The proximal location of demolition and construction may have resulted in a thin covering of Made Ground across the site. In addition, there are off Site areas of infilled ground which may give rise to ground gas.
Mining and quarrying	The Site is not within an area of historic mining or quarrying.
Fieldwork	The investigation took place between 12th-13th April 2012 and comprised: • Drilling of 3 No. Cable Percussive holes; (BH1 to BH3) to a depth of 10.05m bgl • Excavation of 20 No. trial pits (TP1 to TP20) using a JCB 3CX wheeled excavator to depths of between 1.20m bgl (TP18) and 4.00m bgl (TP10). A subsequent visit took place in June 2016 comprising 16 No. trial pits within the asbestos impacted area.
Laboratory testing	8 No. samples of Made Ground soils were submitted for a standard chemical suite including heavy metals, PAHs, and an asbestos screen. 3 No. samples were submitted for leachate analysis.
Ground conditions	Drift geology of Glacial Till over bedrock of the Sherwood Sandstone Group. The site has been shown to be underlain by a thin veneer of Made Ground to between 0.20-0.60m bgl comprising sandy gravelly Clays with mudstone, limestone and brick, and locally other anthropogenic components of metal, plastics and ceramics. Natural soils comprised of medium to very high strength, low plasticity cohesive Glacial Till to the maximum drilled depths of 10.05m bgl.
Ground stability	Excavations into existing Made Ground and the underlying natural soils should be assumed to be unstable. Based on the results of this investigation, inflows of groundwater into excavations should be expected from the upper 200mm to 300mm of granular soil.
Foundations and floor slab recommendations	It was considered that for the proposed development, a potential allowable bearing pressure in the region of 135 kN/m ² may be achieved between 1.00m and 2.00m bgl. Areas of soft ground should have deeper foundations on more competent strata.
Sulphate class	Testing results show that no specific measures are required for buried concrete structures and concrete should be designed to DS-1 and AC-1s.
Contamination – Human Health	Chemical results were compared with GACs for a commercial end use; all determinands were reported to be below the relevant thresholds indicating Made Ground does not present a potential risk to human health. However, chrysotile asbestos was detected within Made Ground soils in TP3 in the north of the Site at a depth of 0.25m bgl, though no quantification testing was completed. A subsequent delineation exercise recorded an additional asbestos detection of chrysotile fibres at <0.001% w/w within the vicinity of the initial detection. Remediation Statement suggested these impacted soils could be excavated and removed from site with associated verification testing.
Contamination – Controlled Waters	Analytical data from leachate testing have been evaluated against GAC values appropriate to the conceptual model for the site. Those applied for this Site were selected from Freshwater Environmental Quality Standards (EQS) in order to determine the risk posed to the main controlled waters receptors at the site. There were no exceedences of the adopted GACs and, as such, the site is not considered to pose a risk to controlled waters.
Gas protection	Ground gas monitoring installations were constructed in BH1, BH2 and BH3 with response zones in the Glacial Till. Monitoring comprised measurement of pressure, methane (CH ₄), percent of lower explosive limit (LEL), carbon dioxide (CO ₂), oxygen (O ₂), hydrogen sulphide (H ₂ S) and gas flow rate. No significant concentrations of carbon dioxide or methane were detected and the site was assessed as a Characteristic Situation 1 – Very Low Risk.



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Radon Requirements	No radon protection measures are required.
Further works identified	No further works were identified.
Waste Soils Classification	With the exception of the asbestos impacted soils in the north of the site, all soils are considered likely to be suitable as inert waste. The asbestos impacted soils are likely to be classified as hazardous waste.
Materials re-use considerations	No suitable classification testing was completed to enable a preliminary material re-use class in accordance with Series 600.
Remediation Strategy or recommendations	A Remediation Strategy suggested the following works: • General site clearance to include hardstanding, stockpile and vegetation; • Removal and verification of asbestos hotspot identified within the north of the site; • Removal and verification of any previously unidentified areas of contamination, where required; • Backfill of resultant excavations with suitable material;



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6. 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 preliminary conceptual model is presented in schematic form in Appendix A Drawing No. TE1604-TE-00-XX-RP-GE-002-V01. The potential pollutant linkages identified and the qualitative risk assessment for these are presented in Table 6.1 below. The terms used in the preliminary qualitative risk assessment are defined in Appendix E.

6.1. 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.

Table 6.1 Preliminary Assessment of Potential Pollutant Linkages.

Justification/Comments	Source	Potential Contaminants of Concern	Pathway	Receptor	Consequence	Probability	Qualitative Risk Assessment
- The site is recorded undeveloped agricultural land from 1872, with a tree lined brook on the northern and western site boundaries. By the early 2000s, a road entrance in the southern corner of the Site has been created alongside a development immediately east of the Site. Aerial imagery indicates the Site was used as a temporary compound for site cabins and materials associated with this development. - Historically the wider site area is predominantly undeveloped land or small scale residential. A number of small pond features in the surrounding area are recorded to be infilled throughout wider developments. A railway cutting/embankment is developed 50m east by 1935 trending approximately north to south. - The site is underlain by geology of Glacial Till, overlying the Sherwood Sandstone Group (Bedrock). Tier Environmental logs recorded the site to be underlain by Made Ground to between 0.20-0.60m bgl comprising sandy gravely clays with mudstone, limestone and brick strength, low plasticity cohesive Glacial Till to the maximum drilled depths of 10.05m bgl. - Upon comparison of soil chemical results against GACs for a commercial/industrial site land use, Tier recorded no exceedances indicating an unlikely risk to current and future site users. 1 No. sample (TP3 at 0.25m bgl) was identified as containing asbestos (chrysotile fibres) during the initial investigation and a second detection of chrysotile fibres was recorded in the Tier 2016 investigation, reported to be <0.001% w/w. - The superficial deposits are classed as a Secondary Undifferentiated Aquifer, and the bedrock is classified a Principal Aquifer. The nearest surface water feature is Gately Brook located 40m northeast of the site boundary. The site is not within a Source Protection Zone and there are no potable abstraction records. Tier Environmental have previously determined the risk to controlled waters to be low given the presence of low permeability clay beneath the Site, the results of leachate analysis and the general absence of contamination of Made Ground soils. - There are no historic records of landfill activity on or around site. A Tier Environmental ground gas risk assessment determined that no ground gas protection measures are required. - The Site is not considered to be located within a Radon Affected Area, as less than 1% of properties are above the Action Level.	Made Ground associated with historic land use and development.	Metals, PAHs, Phenols, pH ₁	Direct contact, ingestion and inhalation of dust Vapour inhalation Dust migration	Future site workers (residential and commercial) Adjacent site users (residential and commercial) Site workers and future maintenance workers Adjacent site users (residential and commercial)	Medium Medium Medium Medium	Unlikely Unlikely Unlikely Unlikely	Low risk Low risk Low risk Low risk
	Asbestos impacted Made Ground soils with TP3 in the north of the site	Asbestos	Lateral and vertical migration of mobile contaminants Inhalation of dust	Future site workers (residential and commercial) Adjacent site users (residential and commercial) Site workers and future maintenance workers	Medium Medium Medium	Likely Likely Likely	Moderate risk Moderate risk Moderate risk
	Hazardous ground gases associated with onsite Made Ground	Ground Gases	Lateral and vertical migration of mobile contaminants Migration of ground gas	Adjacent site users (residential and commercial) Future site workers (residential and commercial) Adjacent site users (residential and commercial) Site workers and future maintenance workers	Medium Medium Medium Medium	Unlikely Unlikely Unlikely Unlikely	Low risk Low risk Low risk Low risk
			Migration of ground gas/explosion	Buildings and services	Severe	Unlikely	Moderate / Low risk

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



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7. PROPOSED FURTHER WORKS

7.1. Further works

The Phase 1 Preliminary Risk Assessment has determined a low risk to human health for Made Ground soils and a very low to low risk to controlled waters at the Site with respect to potential contamination and hazardous ground gases. A Medium Risk remains for the isolated area of asbestos impacted soils in the north of the site.

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 supplement previous investigation and determine shallow soil and groundwater (if encountered) conditions, including whether significant contamination has resulted from past or current land uses;
- to determine the risks posed by any ground contamination and provide updated recommendations on remedial measures to manage such risks (if required);
- to support existing ground gas data with supplementary monitoring visits on new and existing wells;
- to refine advice relating to geotechnical issues associated with the Site.

7.2. Proposed Scope of Works

The following scope of works are proposed

- 1 No. days trial pitting (approximately 8 No. trial pits) to determine the nature and extent of Made Ground and natural deposits across the Site, facilitate soil sampling for environmental and geotechnical testing.
- 1 No. day window sample drilling (approximately 5 No. locations) and installation of 5 No. 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, 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.
- 1 No. confirmatory ground gas risk monitoring visit.



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8. 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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9. REFERENCES

- BRE BR211 (2015). Radon: Guidance on Protective Measures for New Dwellings. IHS BRE Press, Bracknell.
- BRE SD1 (2005). Concrete in Aggressive Ground. Special Digest 1 (revised edition). IHS BRE Press, Bracknell.
- BRE 414 (2001) Protective measures for housing on gas-contaminated land. BRE.
- BS 10175:2011+A2:2017 Investigation of Potentially Contaminated Sites - Code of Practice. British Standards Institution, London.
- BS EN 1997-1:2004 Eurocode 7. Geotechnical Design. General Rules. British Standards Institution, London.
- BS EN 1997-2:2007 Eurocode 7. Geotechnical Design. Ground Investigation and Testing. British Standards Institution, London.
- BS5930:2015+A12020 Code of practice for ground investigations BSI
- BS EN ISO 17892-1-12:2018 Geotechnical investigation and testing BSI
- BS EN ISO 14688-1:2018 Geotechnical Investigation and Testing. Identification and Classification of Soil. Identification and Description. British Standards Institution, London.
- BS EN ISO 14688-2:2018 Geotechnical Investigation and Testing. Identification and Classification of Soil. Principles for a Classification. British Standards Institution, London.
- BS EN ISO 14689-1:2018 Geotechnical Investigation and Testing. Identification and Classification of Rock. Identification and Description. British Standards Institution, London.
- BS8485 2015 Code of Practice for the design of protective measures for methane and carbon dioxide ground gases in new buildings. British Standards
- BS85762013 Guidance on investigations for ground gas – permanent gases and volatile organic compounds (VOCs). BSI,
- CIRIA Rep R 97 (2001) Trenching Practice. Report 097, 2nd edition, CIRIA, London.
- CIRIA Rep R 149 (1995a) Protecting Development from Methane. Report 149, CIRIA, London.
- CIRIA Rep R 150 (1995b) Methane Investigation Strategies. Report 150, CIRIA, London.
- CIRIA Rep R 151 (1995c) Interpreting Measurement of Gas in the Ground Report 151, CIRIA, London.
- CIRIA Rep R 152 (1995d) Risk Assessment for Methane and Other Gases from the Ground. Report 152, CIRIA, London.
- CIRIA Rep R 132 (1996) A Guide for Safe Working on Contaminated Sites. Report 132, CIRIA, London.
- CIRIA C552 (2001) Contaminated land risk assessment. A guide to good practice (report no. C552).
- CIRIA C665 (2007) Assessing the risks posed by hazardous gases to buildings CIRIA, London



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CIRIA C748 (2014) Guidance on the use of plastic membranes as VOC barriers, CIRIA, London

CIRIA C735 (2014) Good practice on the testing and verification of protection systems for buildings against hazardous ground gases. CIRIA.

CIRIA C681 (2009) Unexploded ordnance (UXO) A guide for the construction industry (C681)

CIRIA C785 (2019) Unexploded ordnance (UXO) risk management guide for land-based projects (C785)

CIRIA C758D (2019) Abandoned mine workings manual (C758D)

Contaminated Land: Applications in Real Environments (CL:AIRE) (2011) Definition of Waste Code of Practice (version 2).

Department of Environment Food and Rural Affairs (DEFRA) (2012) Environmental Protection Act 1990:Part 2A Contaminated Land Statutory Guidance (report no. PB13735).

Environment Agency (2000) Technical Aspects of Site Investigation. Report P5-065/TR, Environment Agency, Bristol.

Environment Agency (2002) Guidance on Monitoring Landfill Leachate, Groundwater and Surface Water. Report LFTGN02, Environment Agency, Bristol.

Environment Agency (2007) Evaluation of Models for Predicting Plant Uptake of Chemicals from Soil. Report SC050021/SR, Environment Agency, Bristol.

Environment Agency (2006) Remedial Targets Methodology - Hydrogeological Risk Assessment for Land Contamination (report no.ea/br/e/std/vr10thanni).

Environment Agency (2008) Science Report SC050021/SR7 Compilation of Data for Priority Organic Pollutants for Derivation of Soil Guideline Values.

Environment agency, 2007. Inter-laboratory comparison of in vitro bioaccessibility measurements for arsenic lead and nickel in soil, Science Report SC040060/SR2.

Environment Agency, 2009 Human health toxicological assessment of contaminants in soil (Science Report Final SC050021/SR2)

Environment Agency (2015) Guidance on the Classification and Assessment of Waste Technical Guidance WM3 (1st edition).European Union (1998) Drinking Water Directive (Council Directive 98/83/EC).

Gibbons, R. (1994) Statistical Methods for Groundwater Monitoring. Wiley, New York.

Groundsure Report 2021 GSIP-2021-10752-4061

Highways Agency (2006) Design of Pavement Foundations. Document HD 25/IAN 73/06.

HSE (1991) Protection of Workers and the General Public During the Development of Contaminated Land. HMSO, London.

HSE (2005) Occupational Exposure Limits. HSE report EH40/2005, HMSO, London.



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ICRCL (1986) Notes on the Fire Hazards of Contaminated Land. Guidance Note 61/84, 2nd Edition, Interdepartmental Committee on the Redevelopment of Contaminated Land, London.

Jeffries, J.(2009). A review of body weight and height data used within the Contaminated Land Exposure Assessment model (CLEA). Project SC050021/ Technical Review 1. Bristol: Environment Agency

Land Contamination Risk Management (LCRM) Environment Agency October 2020 <https://www.gov.uk/government/publications/land-contamination-risk-management-lcrm> .

LQM/CIEH Ltd (2015) S4ULs for Human Health Risk Assessment. Land Quality Press, Nottingham.

NHBC (2007) Guidance on Evaluation of Development Proposals on Sites where Methane and Carbon Dioxide are Present (report no .04).

NRA (1994) Protocol for a Leaching Test to Assess the Leaching Potential for Soils from Contaminated Sites. R&D Note 181.

SoBRA (2017) Development of Generic Assessment Criteria for Assessing Vapour Risks to Human Health from Volatile Contaminants in Groundwater – Version 1.0.

The Water Framework Directive, (Standards and Classification) Directions (England and Wales).

UK Water Industry Research (2010) Guidance for the Selection of Water Supply Pipes to be used in Brownfield Sites (report no. 10/WM/03/21)

WHO (2000) Air Quality Guidelines for Europe. 2nd edition, WHO Regional Office for Europe, Copenhagen.

World Health Organisation (2017) Guidelines for Drinking Water Quality (4th edition).

Britain From Above - <https://britainfromabove.org.uk/en/image/WPW060399>

<http://www.warstateandsociety.com/Bombing-Britain>

<https://www.epa.gov/pfas/basic-information-pfas>

UK Maps of Radon, <http://www.ukradon.org/information/ukmaps>

Health and Safety Executive (2015) Construction (Design and Management) Regulations.

Coal Authority Interactive Map Viewer, <http://mapapps2.bgs.ac.uk/coalauthority/home.html>

BGS Geology of Britain Viewer <http://mapapps.bgs.ac.uk/geologyofbritain/home.html>



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10.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
SAC	Special Area of Conservation
SOM	Soil Organic Matter



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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

Legend:

Site Boundary

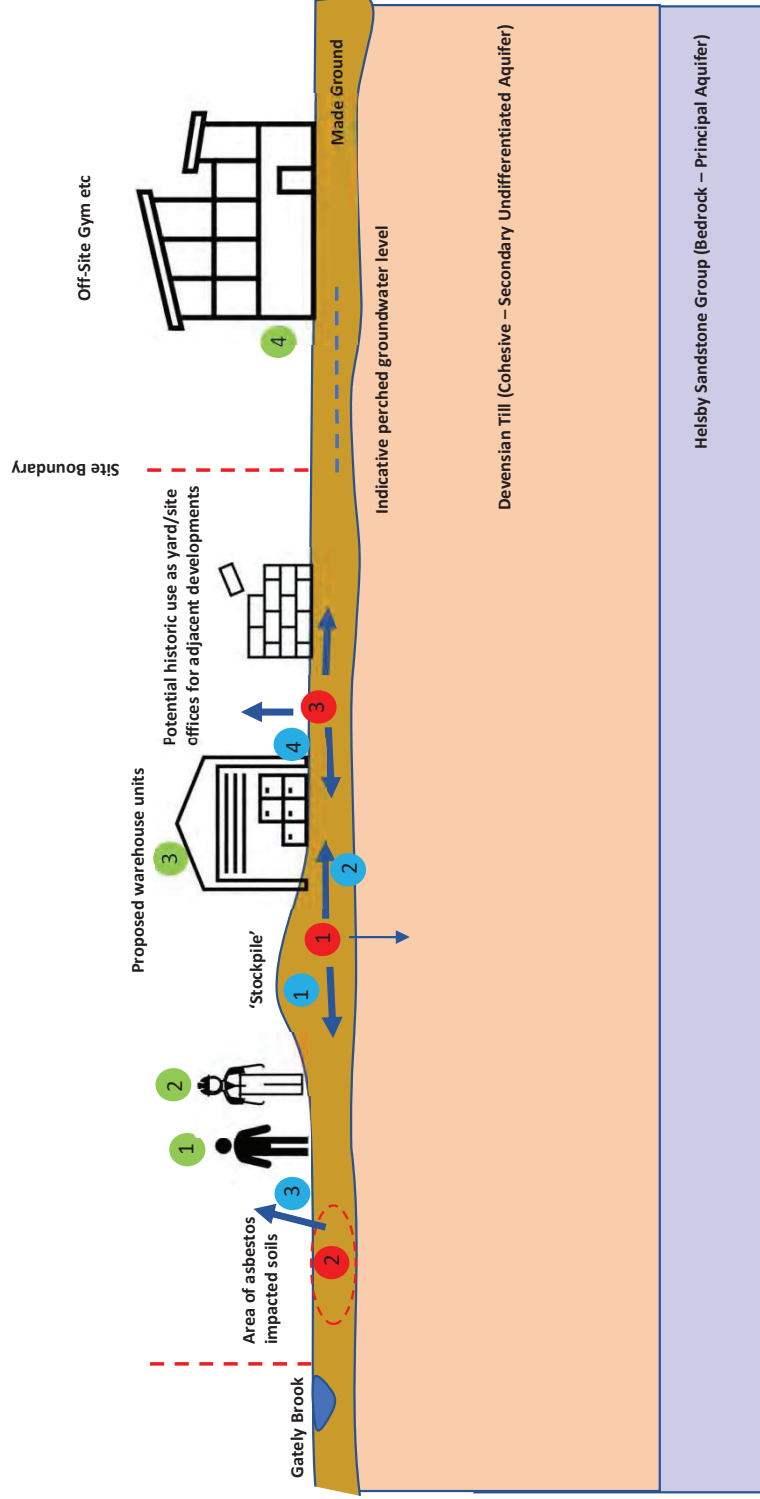


	Tier Environmental Ltd, Suite 513, Chadwick House, Warrington Road, Birchwood, WA3 6AE		
	CLIENT: Northern Powerhouse Land Ltd		
	PROJECT TITLE: Moss Nook, Heald Green, Manchester		
	DRAWING TITLE: Site Location Plan		
	DRAWING REF: TE1603-TE-00-XX-DR-GE-001-V01		
AUTHOR: SJM	REVIEWER: AR	SCALE: NTS	
DRAWING DATE: August 2021		DRAWING STATUS: FINAL	

Moss Nook, Heald Green – Preliminary Conceptual Site Model

North

South



Sources

- 1 Made Ground from historic site use
- 2 Asbestos impacted Made Ground soils with TP3 in the north of the site
- 3 Hazardous ground gases and possible vapours associated with on/off site Made Ground

Pathways

- 1 Direct Contact, ingestion or inhalation
- 2 Lateral and/or Vertical Migration of Mobile Contaminants
- 3 Vapour Inhalation
- 4 Migration of ground gas/explosion

Receptors

- 1 Future Site Users
- 2 Construction Workers
- 3 Buildings/Services
- 4 Adjacent Land Users



Tier Environmental Ltd,
Suite 513, Chadwick House,
Warrington Road,
Birchwood, WA3 6AE

CLIENT: Northern Powerhouse Land Ltd			
PROJECT TITLE: Moss Nook, Heald Green, Manchester			
DRAWING TITLE: Preliminary Conceptual Site Model			
DRAWING REF: TE1599-TE-00-XX-DR-GE-002-V01			
AUTHOR: SJM		REVIEWER: AR	SCALE: NTS
DRAWING DATE: July 2021		DRAWING STATUS: FINAL	



Accommodation Schedule

Site area - 0.80 acres (0.325 Ha)

All areas GIA

Unit 1	
Ground	236 sq.m
Mezzanine	85 sq.m
TOTAL	321 sq.m
Unit 2	
Ground	239 sq.m
Mezzanine	85 sq.m
TOTAL	324 sq.m
Unit 3	
Ground	236 sq.m
Mezzanine	85 sq.m
TOTAL	321 sq.m
Unit 4	
Ground	310 sq.m
Mezzanine	120 sq.m
TOTAL	430 sq.m

TOTAL 1,396 sq.m

Car parking 47 spaces (1/29.7 sq.m)

Cycle parking in each unit



Precedent Images

APPENDIX B - PHOTOGRAPHS

APPENDIX C - GROUNDSURE REPORT