

P3331.5.1

Leaside Business Centre, 43-44 Gillender Street, London, E14 6RP

Phase 1 Geoenvironmental Desk Study

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Part 1 of 7



Phase I Geoenvironmental Desk Study

***Leaside Business Centre, 43-44 Gillender
Street, London, E14 6RP***

Client Name: Poplar HARCA

Project Number: P3331.5.1

Date: 3 July 2019

Client:	Poplar HARCA
Site:	Leaside Business Centre, 43–45 Gillender Street, London, E14 6RW
Report ref.:	P3331.5.1
Author:	P. Godbold MSc FGS & S. Pike MSc MEnvSc
Reviewed:	R. Hickey MSc
Approved:	S. Pike MSc MEnvSc
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Newmarket Business Centre, 341 Exning Road, Newmarket, CB8 0AT

Tel: 01638 663226

www.agbenvironmental.co.uk



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Executive Summary

The client, Poplar HARCA, commissioned agb Environmental to undertake a Phase I desk study of a site at Leaside Business Centre, 43–45 Gillender Street, London, E14 6RW, which is being considered for redevelopment.

Development Proposals

Development proposals are understood to comprise the redevelopment of the existing site to provide residential and commercial spaces. This will include residential accommodation, a new employment hub, Bromley Hall heritage visitor centre with associated offices, the new office space to replace Red Box Container Futures and Poplar Library.

Conclusions

Based on the findings of the CSM plausible pollutant linkages have been identified associated with historical sources on site and current and historical sources off site; additional investigation is therefore recommended.

Recommendations

It is recommended that a Phase II geoenvironmental investigation is undertaken to allow an assessment of underlying ground conditions. This would include the forming of boreholes to allow the installation of groundwater and ground gas monitoring wells that would subsequently be monitored during three return visits to site. Shallow soil samples would also be retrieved from around the site to allow screening for the presence of contaminants of concern. The results of the investigation would be used to update the CSM and revise the risk assessment.

To provide information regarding the underlying ground conditions that can be used as part of foundation design, it is recommended to complete a geotechnical investigation alongside the geoenvironmental investigation.

We would recommend that this report is forwarded to the relevant statutory consultees including the Environment Agency and Local Authority to seek their comments and subsequent approval prior to site works commencing.

Further comments are provided within the report.

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1 Introduction

The client, Poplar HARCA, commissioned agb Environmental to undertake a Phase 1 desk study of a site at Leaside Business Centre, 43–45 Gillender Street, London, E14 6RW.

1.1 Development Proposals

Development proposals are understood to comprise the redevelopment of the existing site to provide residential and commercial spaces. This will include residential accommodation, a new employment hub, Bromley Hall heritage visitor centre with associated offices, the new office space to replace Red Box Container Futures and an upgraded Poplar Library. Available plans are presented in **Appendix 1**.

1.2 Purpose of Investigation

The objectives of the desk study were as follows:

- Research the geology, hydrology and hydrogeology of the site;
- Research the history of the site and surrounding area;
- Collate statutory held records for historical and current potential sources of contamination;
- Establish the potential contaminant sources, the possible pathways and receptors;
- Develop a conceptual site model (CSM) with preliminary risk assessment; and
- Provide outline recommendations.

The report has been formulated in general accordance with BS10175:2011+A2:2017 *Investigation into Potentially Contaminated Sites – Code of Practice*, CLR11 – *Model Procedures for the Management of Land Contamination*, and guidance from the National Planning Policy Framework.

2 Site Details

The location of the site, the topography, and site description are provided below.

2.1 Location and Topography

The roughly squared-shaped site covers an area of approximately 0.22ha, is located in Poplar on the eastern side of the A12, approximately 1km north of Tower Hamlets Town Hall, centred at National Grid Reference 438195,181889. The site is at an elevation of approximately 3.7mOD and is generally flat, the surrounding land slopes down gently from north to south. A location plan is presented in **Appendix 1**.

2.2 Description

A walkover was completed on 16th May 2019, findings are provided below, and selected photographs are presented in **Appendix 2**.

The site was within a mixed residential, commercial and light industrial area. It was bounded by the A12 to the west, a waste disposal lorry depot to the north and part of the east, Ailsa Wharf Development Area to the remainder of the east and south-east, and a cooling and refrigeration company to the south. The site boundaries were demarcated by brick walls to the north, east and south, with onsite buildings forming the north-west and south-west corners. Access was off the A12 to the west through metal fencing and gates between these two buildings.

Bromley Hall, a three storey brick built grade II* listed building, was located in the north-west corner. The three storey Old Poplar Library was located in the south-west corner. A relatively newly constructed live/work unit building was in the south-east with an associated gravel-surfaced courtyard area to the south. Container work units "Red Box Container Futures" were situated in the north east corner. On the northern boundary between Bromley hall and the container works units were several large freight storage containers. Much of the central northern part consisted of a car parking area surfaced by a combination of concrete, asphalt and gravel.

No visual or olfactory evidence of potential contamination was observed during the walkover.

3 Geological Information

Salient information regarding anticipated ground conditions and ground permeability is summarised in the following sections. Unless otherwise noted, the following information has been obtained from public archives via the data supplier GroundSure; the GroundSure reports are presented in **Appendix 3**.

3.1 Anticipated Ground Conditions and Permeability

The anticipated superficial deposits, underlying solid geology and recorded Made Ground within 250m of the site are detailed in **Table 3.1**.

Table 3.1 Ground Conditions and Permeability

Item	Anticipated Ground Conditions	Recorded Permeability
Made/Artificial Ground	None recorded.	-
Superficial Deposits	Alluvium (comprising clay, silt, sand and peat) is present across the whole site, except for the north-western corner.	Moderate to Very Low with intergranular, flow type.
	Kempton Park Gravel Formation (comprising sand and gravel) is present within the north-western corner of the site.	Very High to High, with intergranular flow type.
Solid Geology	The site is wholly underlain by the London Clay Formation (comprising clay).	Low to Very Low with mixed flow type.
Faults	None recorded.	-

3.2 Radon

Information regarding radon is provided in **Table 3.2**.

Table 3.2 Radon

Item	Details
Radon Affected Area	The site is not within a radon affected area, as less than 1% of properties are above the action level.
Radon Protected Measure	No radon protective measures are considered necessary for new properties or extensions as described in Building Research Establishment (BRE) publication BR211.

3.3 Geological Hazards

Based on information provided by the British Geological Survey (BGS), the risk of geological hazards affecting the site is summarised in **Table 3.3**.

Table 3.3 Geological Hazards

Hazard	Distance/Direction	Hazard Rating
Shrink-swell clays	On site (majority of site)	Low: Alluvium – Ground conditions predominantly medium plasticity.
	On site (north-western area only)	Negligible: Kempton Park Gravel - Ground conditions predominantly non-plastic.
Landslides	On site	Very Low.
Ground dissolution of soluble rocks	On site	Negligible.

Hazard	Distance/Direction	Hazard Rating
Compressible deposits	On site (majority of site)	High: very significant potential for compressibility problems.
	On site (north-western area only)	Negligible: No indicators for compressible deposits identified.
Collapsible deposits	On site (majority of site)	Negligible: Alluvium.
	On site (north-western area only)	Very Low: Kempton Park Gravel.
Running sands	On site (majority of site)	Low: Alluvium – possibility of running sands problems after major changes in ground conditions.
	On site (north-western area only)	Very Low: Kempton Park Gravel.

4 Hydrogeology and Hydrology

Salient information regarding aquifers, licensed groundwater abstractions, source protection zones (SPZs), surface water features and flooding within 250m of the study site is summarised below.

4.1 Aquifer

Details regarding aquifers beneath the site are detailed in **Table 4.1**.

Table 4.1 Aquifers

Item	Distance/Direction	Designation
Superficial Deposits	On site (majority of site)	Alluvium: Secondary (undifferentiated) Aquifer.
	On site (north-western area only)	Kempton Park Gravel: Secondary A Aquifer.
Solid Geology	On site	Unproductive.

4.2 Abstraction Licences

Recorded abstraction licences within 250m of the site are detailed in **Table 4.2**.

Table 4.2 Abstraction Licences

Item	Distance/Direction	Details
Groundwater Abstraction	-	None recorded.
Surface Water Abstraction	-	None recorded.
Potable Water Abstraction	-	None recorded.

4.3 Source Protection Zones and Groundwater Vulnerability

Details of SPZs and groundwater vulnerability within 250m of the site are summarised in **Table 4.3**.

Table 4.3 Source Protection Zones and Groundwater Vulnerability

Item	Distance/Direction	Classification / Soil Vulnerability Category
SPZs	-	None recorded.
SPZs within Confined Aquifers	-	None recorded.
Groundwater Vulnerability and Leaching Potential	On site	Minor aquifer / High leaching potential. Category: HU (Soils considered to be highly permeable in the absence of site specific information).

4.4 Water Network and Surface Water Features

Details of water networks and surface water features are provided in **Table 4.4**.

Table 4.4 Water Network and Surface Water Features

Item	Distance/Direction	Details
Ordnance Survey MasterMap Water Network	64m north-east	River Lea or Lee. Tidal river or stream.
	190m north-west	River Lee Navigation. Canal.
Surface Water Features (not represented on mapping).	47m north-east and 17m north-west	No further details given (2 records).

4.5 Flooding

Details regarding flooding within 250m of the site are provided in **Table 4.5**.

Table 4.5 Flooding

Item	Details
Environment Agency Zone 2 and Zone 3 Floodplains	On site (Flood Zone 2 and 3).
Risk of Flooding from Rivers and the Sea (RoFRaS) Flood Rating	The highest risk of flooding on site is recorded as 'Low'.
Flood Defences	46m and 97m north-east; and 201m north-west.
Areas benefitting from Flood Defences	Identified (approximately 50m north-west).
Areas benefitting from Flood Storage	None identified.
Groundwater Flooding Susceptibility Areas and Flooding Confidence Areas	There are groundwater flooding susceptible areas within 50m of the site. This relates to superficial deposits flooding. The highest susceptibility to groundwater flooding is recorded as 'potential at surface'; the BGS confidence in this result is 'Moderate'.

5 Historical Information

A summary of recorded historical features and a review of historical maps are provided below.

5.1 Historical Industrial Sites

Salient information regarding historical industrial sites within 250m is provided in **Table 5.1**.

Table 5.1 Records of Historical Potentially Contaminative Uses

Item	Distance/Direction	Use
Potentially Contaminative Uses (Multiple records. The 'Use' column lists records with variations in usage).	On site	Unspecified tanks / commercial industrial (1938).
	3m east	Unspecified wharf (1894).
	5m east	Unspecified tanks (1894).
	7m east	Unspecified commercial / industrial (1920).
	27m north	Fire station (1920).
	29m north	Distillery (1898).
	65m north	Unspecified Mills (1920 / 1938).
	76m north	Distillery Mills (1867).
	82m north-east	Gas works (1896).
	92m north-east	Unspecified commercial / industrial (1973).
	135m north-east	Railway sidings (1938).
Historical Tank Database	-	None recorded.
Historical Energy Features Database	-	None recorded.
Historical Petrol and Fuel Database	-	None recorded.
Historical Garage and Motor Vehicle Repair Database	-	None recorded.
Historical Military Sites	-	None recorded.
Potentially Infilled Land		None recorded.

5.2 Historical Mapping

With reference to the GroundSure historical maps, salient information regarding historical land use either on or within 250m of the site is summarised in **Table 5.2**. The GroundSure historical maps are presented in **Appendix 3**.

Table 5.2 Summary of Historical Maps

Map Date	Map Scale	On Site	Off Site
1867* 1869 1870 1872* 1873*	1:10,560 1:2,500 1:1,056 1:10,560 1:10,560	A row of predominantly terraced residential properties are present along the western site perimeter fronting onto Brunswick Road (which forms the western perimeter). The property in the extreme north-western corner is Bromley Hall. The remainder of the site is residential gardens; with more formal gardens extending east from Bromley Hall.	Residential gardens (formal in layout, including two ponds) continue east to Bow Creek / River Lea 80m north-east of the site. Formal gardens and / or open ground are illustrated to the south-east, with further substantial terraced houses (with gardens and ponds) adjacent south. Open ground is present to the south-west (beyond Brunswick Road); with a significant property (Manorfield House) 80m west. 90m north is a Wash Pit, at the southern edge of the Four Mills Distillery.

Map Date	Map Scale	On Site	Off Site
1894 1896 1896 1898 1898 1899	1:10,560 1:2,500 1:10,560 1:10,560 1:10,560 1:10,560	The residential terraced houses and Bromley Hall are still shown (slightly extended). Formal gardens are no longer illustrated.	St. Leonards Wharf (Oil Works) is present adjacent east, extending to River Lea. Multiple tanks shown. Significant terraced housing present south-east, south, west and north-west of the site. A Gas Works is located east of the River Lea (minimum 100m from the site).
1916 1920	1:2,500 1:10,560	The residential terrace appears to have been replaced by a Library within the south-west of the site; but Bromley Hall building (unnamed) is still present.	A Fire Station is located 50m north. There are no other significant changes from the previous edition.
1948 1949 1949	1:2,500 1:2,500 1:10,560	The Library remains, but residential houses adjacent north are no longer shown. Bromley Hall (unnamed) is shown with a different shaped footprint. Remainder of site is shown as open ground.	The Fire Station has been extended south up to the site perimeter. The majority of residential houses to the west of Brunswick Road are no longer present, the area is shown as open ground. No other significant changes.
1954 1954 1955 1955	1:1,250 1:2,500 1:10,560 1:1,250	A garage is present within the centre of the site. No other changes.	The open area west of Brunswick street (formerly residential properties) is now referred to as Public Gardens. No other significant changes.
1962 1964* 1965 1967* 1968*	1:2,500 1:2,500 1:10,560 1:1,250 1:2,500	There are no apparent significant changes from the previous edition.	There are no apparent significant changes from the previous edition.
1973 1974* 1975	1:10,000 1:1,250 1:1,250	The garage has extended east to the eastern site perimeter. No other changes.	Changes to building configuration within St. Leonards Wharf east of the site. Additional unidentified buildings adjacent south of the site. A12 road now present west of site (1973). New residential blocks west of the site (to the west of A12 – the former Brunswick Road). No other significant changes.
1981 1982	1:10,000 1:1,250	There are no apparent significant changes from the previous edition.	Brunswick Road now called Gillender Street (1982).
1989 1989 1991 1992 1994 1995	1:10,000 1:1,250 1:1,250 1:1,250 1:10,000 1:1,250	There are no apparent significant changes from the previous edition.	1992 Area adjacent east of site referred to as a Depot. Weighbridge noted north-east of site. Site likely to be waste transfer site. No other significant changes.
2002 2010 2014	1:10,000 1:10,000 1:10,000	There are no apparent significant changes from the previous edition.	There are no apparent significant changes from the previous edition.

* Partial map

6 Environmental Information

Records of environmental permits, incidents and registers along with details of landfill or waste sites on or within the vicinity of the site, obtained from public archives via the data supplier GroundSure, are summarised in this section.

6.1 Environmental Permits, Incidents and Registers

Salient information regarding sites holding licences and authorisations, dangerous or hazardous sites, pollution incidents and recorded contaminated land within 250m of the study site is provided in **Table 6.1**.

Table 6.1 Environmental Permits, Incidents and Registers

Item		Distance/Direction	Detail
Industrial Sites Holding Licences and/or Authorisations	Historic IPC Authorisations	-	None recorded.
	Part A(1) and IPPC Authorised Activities	-	None recorded.
	Red List Discharge Consents	-	None recorded.
	List 1 Dangerous Substances Inventory Sites	-	None recorded.
	List 2 Dangerous Substances Inventory Sites	-	None recorded.
	Part A(2) and Part B Activities and Enforcements	-	None recorded.
	Category 3 or 4 Radioactive Substances Authorisations	-	None recorded.
	Licensed Discharge Consents	-	None recorded.
	Water Industry Referrals	-	None recorded.
	Hazardous Substance Consents and Enforcements	161m east	Historical consent. Address: Esso Gas, Ailsa Wharf. No enforcement notified.
Dangerous or Hazardous Sites		On site	Company: Southern Counties Gas. Address: LPG Holdings (t/a Southern Counties Gas), Ailsa Wharf. Historical NIHHS site.
Environment Agency Recorded Pollution Incidents	National Incidents Recording System, List 2 (29 records)	22m east	2 records. Incident date: Mar. 2014 Pollutant Description: Household waste Tyres.
		75m east	3 records. Incident date: Feb. 2006 Pollutant Description: Smoke / metal waste / vehicle parts.
		80m east	7 records. Incident date: Jun. 2005 Pollutant Description: Firefighting runoff / batteries / tyres / smoke / metal waste.
		105m east	4 records. Incident date: Oct. 2006 Pollutant Description: Vehicle parts / batteries / tyres / metal waste.

Item		Distance/Direction	Detail
		120m south-east	6 records. Incident date: Oct. 2006 Pollutant Description: Construction demolition waste / Mixed waste oils / batteries / metal waste / vehicles / tyres.
		141m south-east	3 records. Incident date: Aug. 2002 Pollutant Description: Commercial and household waste.
		181m south-east	4 records. Incident date: Mar. 2014 Pollutant Description: Batteries / tyres / vehicles / mixed oils.
	National Incidents Recording System, List 1	-	None recorded.
Recorded Part 2A Sites		-	None recorded.

6.2 Landfill and Other Waste Sites

Details of Environment Agency historical or current landfill sites, BGS/DoE non-operational landfill sites, Local Authority Landfill sites or other waste treatment, transfer or disposal sites within 250m of the site are provided in **Table 6.2**.

Table 6.2 Landfill and Other Waste Sites

Item		Distance/Direction	Detail
Landfill Sites	Environment Agency Landfills	-	None recorded.
	Environment Agency Historical Landfills	-	None recorded.
	BGS/DoE Non-operational Landfill Sites	-	None recorded.
	Landfills from Local Authority and Historical Mapping Records	-	None recorded.
Other Waste Sites	Waste treatment, transfer or disposal sites.	-	None recorded.
	Environment Agency Licensed Waste Sites	4m north	Name: Cleanaway Ltd. Address: Tunnel Approach Waste Transfer Station. Type: Household, Commercial and Industrial waste transfer station. Issue date: Feb. 2002.
		18m north-east	Name: Veolia Cleanaway Address: Tunnel Approach Waste Transfer Station. Type: Household, Commercial and Industrial waste transfer station. Issue date: Feb. 1990. <i>Surrendered: 2016.</i>
		62m south-east	Name: Blackwell Marine Diesel Ltd. Address: Blackwell Marine Diesel Ailsa Street. Type: Waste licence. Issue date: Apr. 2012.

Item	Distance/Direction	Detail
	95m east	Name: Quick Skips London. Address: Quick Skips London, Ailsa Street. Type: Waste licence. Issue date: Mar. 2012.

6.3 Current Land Uses

Records of current potentially contaminative land uses are summarised in **Table 6.3**.

Table 6.3 Potentially Contaminative Land Uses

Item	Distance/Direction	Detail
Potentially Contaminative Industrial Sites (26 records)	4m south	Fridgehire Co. UK / Activity: Cooling and refrigeration.
	25m south	BMW Used Spare Parts / Activity: Vehicle parts and accessories.
	29m east	Depot. / Activity: Container and Storage.
	58m south	Electricity sub-station.
	62m north	Unspecified works or factories.
	75m north	Iron Mountain Ltd / Activity: Container and storage.
	92m east	St Leonard's Wharf.
	93m north	Unspecified Works or factories.
	101m west	Electricity sub-station.
	102m south-east	Quick Skips London Recycling Ltd.
	154m west	Electricity sub-station.
	165m east	Depot (container and storage).
	171m south-east	Ailsa Wharf.
	189m south	Chimney.
	(A further 11 records within 250m of the site. Refer to Appendix 3).	
Petrol and Fuel Sites	25m north	Obsolete.
Underground Electricity Transmission Cables	-	None recorded.
High Pressure Gas Transmission Pipelines	-	None recorded.

6.4 Designated Environmentally Sensitive Sites

Details of Environmentally Sensitive Sites within 250m of the study site as summarised in **Table 6.4**.

Table 6.4 Environmentally Sensitive Sites

Environmentally Sensitive Site Type	Distance/Direction	Data Source
Nitrate Vulnerable Zone	97m north-east	DEFRA

6.5 Railways and Tunnels

Details regarding railways and tunnels on or within 250m of the study site are provided in **Table 6.5**.

Table 6.5 Railways and Tunnels

Feature	Distance/Direction	Use / Detail
Tunnels	-	None recorded.
Historical Railway and Tunnel Features	37 records from 10m – 228m east and north-east, and north-west.	Railway sidings (37 records spanning 1894 to 1962). (<i>Not shown clearly on historical mapping</i>).
Historical Railways	-	None recorded.
Active Railways	-	None recorded.
Railway Projects	-	None recorded.

7 Ground Workings, Mining, Extraction and Cavities

Salient information regarding historical and current surface and underground working features, extraction and natural cavities on or within the vicinity of the site is summarised below.

7.1 Working Features

Details of historical surface ground working features, historical underground working features and current ground working features within 250m of the site are summarised in **Table 7.1**.

Table 7.1 Working Features

Feature	Distance/Direction	Use/Detail
Historical Surface Ground Working Features	3m - 6m east	(2 records) Unspecified Wharf (1894).
	7m – 9m east	(3 records) Pond and Unspecified Wharf (1867 / 1894).
	11m north	Unspecified Wharf (1894).
	42m east	Unspecified Wharf (1894).
	65m – 86m north	(6 records) Dock (1894 – 1949).
	95m east	Unspecified Pit (1938).
	108m – 110m east	(2 records) Unspecified Wharf / wharves (1898 – 1989).
	114m east	Unspecified Ground Workings (1949).
	148m north-west	Pond (1867).
	151m – 156m east	(2 records) Unspecified Wharf (1894).
	170m – 213m south-east	(7 records) Unspecified Wharf (1894 – 1949).
Historical Underground Ground Working Features	-	None recorded.
Current Ground Workings	-	None recorded.

7.2 Mining, Extraction and Natural Cavities

Details of mining, extraction and cavities are provided in **Table 7.2**.

Table 7.2 Mining, Extraction and Natural Cavities

Feature	Distance/Direction	Detail
Historical Mining	-	None recorded.
Coal Mining	-	None recorded.
Records Held by Johnson Poole and Bloomer	-	The study site is located within 1000m of an area when Johnson Poole and Bloomer hold information if required.
Non-coal Mining	-	None recorded.
Non-coal Mining Cavities	-	None recorded.
Natural Cavities	-	None recorded.
Brine Extraction	-	None recorded.
Gypsum Extraction	-	None recorded.
Tin Mining	-	None recorded.
Clay Mining	-	None recorded.

8 Conceptual Site Model and Risk Assessment

An initial CSM and preliminary assessment of plausible contaminant linkages is presented in this section. It is aimed at identifying possible risks, if any, arising from substances used or deposited on-site, or from other sources of land contamination. Both past and current potentially contaminative land uses have been considered.

8.1 Potential Contaminant Sources

Based on the site walkover and desk study research, the identified potentially contaminative land uses on or within the vicinity of the site are summarised in **Table 8.1**.

Table 8.1 Potential Contaminative Sources

Item	Detail
Potentially Contaminative Sources	<p><u>Historical Site Use</u> Demolished former houses, garage.</p> <p><u>Current Site Use</u> None identified.</p> <p><u>Historical Land Use / Features Within Vicinity</u> Oil works, wharf, depots, waste transfer station, petrol and fuel site.</p> <p><u>Current Land Use / Features Within Vicinity</u> Fuel supply depot, cooling and refrigeration company, vehicle spare parts company, depots, unspecified works and factories, wharf, electrical sub-stations and railway sidings.</p>
Potential Contaminants of Concern	Metals, petroleum hydrocarbons, polycyclic aromatic hydrocarbons (PAHs), asbestos containing materials (ACMs), volatile and semi-volatile organic compounds (VOCs and SVOCs), polychlorinated biphenyls (PCB), ground gas.

8.2 Pathways

For this assessment, the principal potential pathways for contaminant migration are provided in **Table 8.2**.

Table 8.2 Pathways

Source	Pathway
Soil / dust / fibres	Dermal contact, ingestion and inhalation.
Liquid (including surface water / groundwater)	Dermal contact, ingestion, leaching, infiltration and migration.
Harmful ground gases / vapour	Inhalation, accumulation within confined spaces with subsequent asphyxiation or explosion.

8.3 Receptors

Based on the proposals and the findings of the desk study the identified receptors are described in **Table 8.3**.

Table 8.3 Receptors

Receptor	Detail
Site workers	Site workers are anticipated to include those involved with the construction works at the site, particularly ground workers.
End Users	Residents, workers and visitors.

Receptor	Detail
Controlled Waters	The superficial Alluvium beneath the majority of the site is designated a Secondary (undifferentiated) Aquifer, and the Kempton Park Gravel beneath the north-western part is designated a Secondary A Aquifer. Solid geology that underlies most of the solid geology and the superficial deposits is Unproductive. The site is not in a SPZ and there are no abstractions within 250m. The River Lea is 64m north-east of the site at its closest point.
Flora and fauna	Plants and animals that may be affected by proposed development.
Buildings	The completed buildings.
Buried services	Potable water pipes are anticipated as part of proposals.

8.4 Preliminary Qualitative Risk Assessment

A CSM illustrating a preliminary assessment of plausible contaminant linkages has been formulated for this site and presented in tabular format in **Appendix 4**. The contaminant linkages have been individually assessed and a summary of the potential geoenvironmental risks associated with the site and in the context of the proposed residential development is provided in **Table 8.4**.

Table 8.4 Summary of Preliminary Qualitative Risk Assessment

Issue	Risk Rating	Justification Comments
Contamination Potential		
Potential for significant on-site contamination.	Moderate	Potential for contaminant sources identified on site beneath the existing hard surfacing.
Potential for contaminants to migrate via soil/air/groundwater pathways to site.	Moderate	Multiple potential sources of contamination in the vicinity of the site and the underlying strata may facilitate migration of contaminants within the ground gas and groundwater.
Potential for contaminants to migrate via soil/air/groundwater pathways off-site.	Moderate	Potential for contaminant sources identified on site. The underlying strata may facilitate migration of contaminants within the ground gas and groundwater.
Geoenvironmental Risk		
Risk of harm to human health based on anticipated conditions.	Moderate	Existing hardstanding restricts the potential pollutant linkages between potential contaminants within the soils and ground water beneath the site and potential receptors. Proposed soft landscaping and residential building may allow complete source-pathway receptor linkages to occur.
Risk to site workers.	Low to moderate	A potential sources of contamination has been identified on-site. Suitable personal protective equipment (PPE), safe systems of work and a watching brief during groundworks will be required.
Risk of pollution to controlled water.	Moderate	Potentially complete pollutant linkage have been identified.
Hazards to flora and fauna.	Low	Any plants introduced to the site as part of the soft landscaping proposal are likely to be planted in imported clean topsoil. .
Hazards to building structures and services – excluding ground gas.	Low to moderate	Potential contaminants have been identified which could impact foundations and water supply pipes.

Issue	Risk Rating	Justification Comments
Liabilities		
Likelihood of designation as Contaminated Land under Part 2A of EPA 1990.	Low	Potential for contamination identified and is likely to be addressed under the planning regime.
Liability issues for owner.	Moderate	Potential for contaminant sources identified on site which could impact receptors on and off site.
Development Implications		
Possible requirement for remediation of soil.	Moderate	Potential sources of on site contamination identified. Phase II investigation required to clarified risks.
Possible requirement for remediation of groundwater.	Low to moderate	Potential sources of contamination identified. Phase II investigation required to clarified risks. Isolating and remediating the potential source of any contamination found may be difficult due to previous industrial use both on site and the surrounding area.
Possible requirement for gas protection.	Moderate	Potentially complete pollutant pathways identified. Further investigation required to clarify risks.
Special requirements for water supply pipes.	Moderate	Potential sources of hydrocarbon contamination have been identified which could impact the specification of water supply pipes required.
Potential limitations on foundation design.	Low to moderate	Potential contaminants have been identified which could impact foundations.
Risk of encountering materials classed as hazardous waste.	Low	Potential sources of onsite contamination identified. Phase II investigation required to classify potential waste materials.

9 Conclusion and Recommendations

Recommendations for the site with regards to development proposals and potential contaminated land are discussed below.

9.1 Summary of Development Proposals

Development proposals are understood to comprise the redevelopment of the existing site to provide residential and commercial spaces. This will include residential accommodation, a new employment hub, Bromley Hall heritage visitor centre with associated offices, the new office space to replace Red Box Container Futures and Poplar Library.

9.2 Conclusion

Based on the findings of the CSM plausible pollutant linkages have been identified associated with historical sources on site and current and historical sources off site; additional investigation is therefore recommended.

9.3 Recommendations

Recommendations are provided below.

9.3.1 Phase II Geoenvironmental Investigation

It is recommended that a Phase II geoenvironmental investigation is undertaken to allow an assessment of underlying ground conditions. This would include the forming of boreholes to allow the installation of groundwater and ground gas monitoring wells that would subsequently be monitored during three return visits to site. Shallow soil samples would also be retrieved from around the site to allow screening for the presence of contaminants of concern. The results of the investigation would be used to update the CSM and revise the risk assessment.

9.3.1 Geotechnical Investigation

To provide information regarding the underlying ground conditions that can be used as part of foundation design, it is recommended to complete a geotechnical investigation alongside the geoenvironmental investigation.

9.3.2 Watching Brief

It is recommended that a watching brief is maintained on site, particularly during the groundwork stage. During any ground works an appraisal of the exposed soils should be made by a competent person. If any material is noted to show visual and/or olfactory signs of contamination it should be stockpiled separately and tested prior to its appropriate removal off-site or re-use. If soils suspected of being contaminated are encountered, it is recommended that a contaminated land specialist is consulted.

9.3.3 Consultees

We would recommend that this report is forwarded to the relevant statutory consultees including the Environment Agency and Local Authority to seek their comments and subsequent approval.

10 Limitations

The conclusions and recommendations made in this report are limited to those that can be made on the basis of the research carried out. The results of the research should be viewed in the context of the work that has been carried out and no liability can be accepted for matters outside the stated scope of the research. Any comments made on the basis of information obtained from third parties are given in good faith on the assumption that the information is accurate. No independent validation of third party information has been made by agb Environmental Ltd.

Should any changes to the development be proposed, including changes to the proposed landscaping, then the risks will need to be reassessed. This may require additional site investigation work and may result in the need for alteration of the remedial works.

Advice provided within this report is based on current guidelines available at the time of writing. This report is subject to amendment in light of additional information becoming available or statutory consultee review, including the Environment Agency and Local Authority and the NHBC.

It is possible the conditions observed during the site investigation may change. This may result in changes to sources, pathways or receptors that were unforeseen and unexpected. Statements relating to ground gas or groundwater conditions are based on observations made at the time of the site investigation (unless otherwise stated). Ground gas or groundwater conditions may vary as a result of seasonal fluctuations or other effects.

Ground contamination can exist as small discrete areas of contamination and there can be no certainty that any or all such areas have been sampled or identified. This is particularly significant for an investigation by exploratory holes (as used in this site investigation) as a relatively small sample of soil is extracted, which may not be entirely representative of the surrounding ground conditions.

This report is written in the context of an agreed scope of work between agb Environmental Ltd and the Client and should only be used in this specific context. Re-interpretation of the Site Investigation and/or this report in whole or part may become necessary if additional information becomes available or practices or legislation changes. agb Environmental Ltd does not provide legal advice; the advice of the Client's legal advisors may also be required. agb Environmental Ltd Terms and Conditions apply.