Castledine Environmental

LAND CONTAMINATION SURVEYS

Phase 1 Land Contamination Risk Assessment

for

Demolition of Existing Building and Construction of 4 No. Dwellings

on the site of

No.382 Bath Road, Heathrow, London UB7 0DH

Date: October 2022

Status:	Final Report
Reference:	3412A P1 Verma – Heathrow, London
Date:	October 2022

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EXECUTIVE SUMMARY

The following assessment is formed of a retrospective site walkover from photography dated July 2021 and October 2022, and the associated information collected to compile the following report is dated from the same period. No details, observations or photography of the interior of the building onsite at this period, or the condition of the rear gardens were available at the time of reporting.

The site is currently occupied by a disused former post office / convenience shop located within the southern extents of the Harmondsworth village. The current building is the only recorded development to have occurred within the site and therefore the potential risk from onsite sources of contamination is considered to be low; however due to the presence of a historical offsite garage previously located along the western boundary and associated risk of hydrocarbon contamination and the potential for asbestos contamination exists. It is the opinion of Castledine Environmental that the site represents a **LOW to MODERATE** risk with respect to the proposed development.

It is recommended, given the age of the building onsite that it should be subject to an asbestos survey and removal by appropriately qualified personnel prior to any demolition or redevelopment occurring in order to ensure site works do not cause future contamination of the site.

It is recommended that a Phase II Site Investigation in line with section 14 is undertaken.

A watching brief (as outlined in Appendix E) should be carried out by the site supervisor during the course of demolition, site clearance and construction works for any obvious contamination (e.g. oil spillage in ground, buried waste, possible asbestos containing material). Should previously unreported or undiscovered contamination be identified, then development should stop and Castledine Environmental should be contacted to determine if further assessment or changes to the remediation scheme are required.

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1.0 QUALITY ASSURANCE

Castledine Environmental confirm that all reasonable efforts have been made to ensure that the information outlined within this report is accurate.

Castledine Environmental would further confirm that due care, attention and technical skill were used in the creation of this report.

For and on behalf of Castledine Environmental

Kevin Castledine

(Director)

2.0 LIMITATIONS

The conclusions and recommendations made in this report are limited to those based on the findings of the investigation. Where comments are made based on information obtained from third parties, Castledine Environmental assumes that all third-party information is true and correct. No independent action has been undertaken to validate the findings of third parties. The assessments and interpretation have been made in line with legislation and guidelines in force at the time of writing, representing best practice at the time.

This survey has not included asbestos within existing structures, invasive plant species, geotechnical considerations or any elements unconnected with potential ground contamination at the site. If required, such surveys should be undertaken by suitably accredited organisations.

There may be other conditions prevailing at the site which have not been disclosed by this investigation and which have not been taken into account by this report. Responsibility cannot be accepted for conditions not revealed by the investigation.

3.0 INTRODUCTION

Castledine Environmental have been appointed by Mr. J. Verma to undertake a Phase 1 Desk study on a site at No.382 Bath Road, Heathrow, London UB7 0DH.

The client intends to demolish the current building present onsite, and erect four residential dwellings with private gardens, associated infrastructure and areas of soft landscaping.

4.0 SCOPE

Castledine Environmental have prepared this report for the sole use and reliance of J Verma and their appointees for the purpose of ensuring compliance with:

- Paragraph(s) 174, 179, 183 & 184 of the National Planning Policy Framework 2021
- Part C1 of the building regulations
- Condition No.15 of the London Borough of Hillingdon Council planning approval reference 76608/APP/2022/197 https://planning.hillingdon.gov.uk/OcellaWeb/planningDetails?reference=76608/APP/2022/197&from=planningSearch

This report may not be used or relied upon by any unauthorised third party, or for any other proposed use than that specified above, without the explicit written agreement of Castledine Environmental
The report consists of a preliminary risk assessment in accordance with BS10175:2011+A2:2017, CLR11 “Model Procedures for the Management of Land Contamination” and LCRM “Land Contamination Risk Management”.

The objectives of the report are:-

- To assess historical activities at the site with respect to their potential impact on the site environment.
- To characterise the environmental setting of the site, identify migration pathways and vulnerable receptors for contamination originating at the site, focusing on potential soil and groundwater liabilities.
- To assess historical and current surrounding land use in relation to known or potential off-site contamination issues that may impact on the subject site and
- To develop a preliminary conceptual site model (CSM).

5.0 SITE DESCRIPTION

The following assessment is formed of a retrospective site walkover from site observations dated October 2022. No details, observations or photography of the interior of the building onsite at this period, or the condition of the rear gardens were available at the time of reporting.

The site is located in Heathrow, London at National Grid Reference: 505934,177005 and is approximately 0.07ha in area.

The site is rectangular in shape and located in a predominantly urbanised area. Residential housing is present to the north and east, Bath Road A4 to the south with Heathrow Airport beyond and a commercial area to the west of site.

At the time of the information provided, the site was recorded to comprise of a single two storey, brick and wood façade building with potential for additional loft space. The building fronts onto Bath Road, with a mix of concrete hardstanding and separate squared area of crushed hardcore. Previous photography of the site suggests the hardcore covering present at the frontage has been recently created (not recorded before May 2021) and previously had also been formed of concrete.

The ground floor windows and door were observed to be bordered up, and a blue approximately 2m high blue fencing is segregates the rear of the property to the west of the building, whilst a white painted residential garage door is located along the east of the building. The site was also noted to be secured with herras fencing across the southern boundary.

Photos of the site are present in Appendix D

6.0 REGULATORY AUTHORITY AND OTHER ENVIRONMENTAL DATA

An environmental search listing historical and environmental factors likely to affect the property has been reviewed.

The most pertinent information is summarised in the following sections.

A copy is presented in Appendix A.

Additional geological and hydrological data was obtained from the British Geological Survey.

6.1 HYDROLOGICAL

6.1.1 AQUIFER

6.1.1.1 SUPERFICIAL GEOLOGY

ID	Distance (m)	Direction	Designation	Description
1	0	On Site	Principal	Geology of high intergranular and/or fracture permeability, usually providing a high level of water storage and may support water supply/river base flow on a strategic scale. Generally principal aquifers were previously major aquifers
2	111	NW	Unproductive	These are rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow

6.1.1.2 BEDROCK GEOLOGY

ID	Distance (m)	Direction	Designation	Description
1	0	On Site	Unproductive	These are rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow

6.1.2 ABSTRACTIONS AND PRIVATE WATER SUPPLIES

None recorded within 250m of site with the nearest beyond this being located 495m north east of site. The licence related to spray irrigation usages direct from a borehole and was in effect from 25/09/1996 with no end date recorded.

6.1.3 SOURCE PROTECTION ZONE

The site is not located in a source protection zone (SPZ).

6.1.4 GROUNDWATER VULNERABILITY AND SOIL LEACHING POTENTIAL

An assessment of the vulnerability of groundwater to a pollutant discharged at ground level based on the hydrological, geological, hydrogeological and soil properties within a one-kilometre square grid. Groundwater vulnerability is described as High, Medium or Low as follows:

- High - Areas able to easily transmit pollution to groundwater. They are likely to be characterised by high leaching soils and the absence of low permeability superficial deposits.
- Medium - Intermediate between high and low vulnerability.
- Low - Areas that provide the greatest protection from pollution. They are likely to be characterised by low leaching soils and/or the presence of superficial deposits characterised by a low permeability.

ID	Location	Summary	Soil / Surface	Superficial geology	Bedrock geology
1	On site	Summary Classification: Principal superficial aquifer - Medium Vulnerability Combined classification: Unproductive Bedrock Aquifer, Productive Superficial Aquifer	Leaching class: Intermediate Infiltration value: >70% Dilution value: 300-550mm/year	Vulnerability: Medium Aquifer type: Principal Thickness: 3-10m Patchiness value: >90% Recharge potential: Medium	Vulnerability: Unproductive Aquifer type: Unproductive Flow mechanism: Mixed
A	On site	Summary Classification: Principal superficial aquifer - Medium Vulnerability Combined classification: Unproductive Bedrock Aquifer, Productive Superficial Aquifer	Leaching class: Intermediate Infiltration value: >70% Dilution value: 300-550mm/year	Vulnerability: Medium Aquifer type: Principal Thickness: 3-10m Patchiness value: >90% Recharge potential: High	Vulnerability: Unproductive Aquifer type: Unproductive Flow mechanism: Mixed

6.1.5 GROUNDWATER VULNERABILITY – LOCAL INFORMATION

This dataset identifies areas where additional local information affecting vulnerability is held by the Environment Agency. The Groundsure report records the site as being in an area where:

"Highly vulnerable principal superficial aquifer is present in river terraced gravels with only a thin cover of low permeability silts and/or alluvium (shown as unproductive)."

6.1.6 POTENTIAL SURFACE WATER

The Groundsure report records no hydrological features located within 250m of site.

6.1.7 DISCHARGE CONSENTS

None recorded within 500m of site.

6.2 PERMITTED PROCESSES

None recorded within 500m of site.

6.3 POLLUTION INCIDENTS

The Groundsure report records an incident located 13m south of site and dated 12/12/2006. The incident related to sewage materials / sludge with a significant impact to land quality, a minor impact to water quality and no impact to air quality.

No further pollution incidents are recorded within 250m of site and no significant impact incidents are located within 500m of site.

6.4 RADIOACTIVE SUBSTANCES REGISTRATIONS

None recorded within 500m of site.

6.5 WASTE

6.5.1 LICENSED WASTE MANAGEMENT FACILITIES (LOCATIONS)

None recorded within 500m of site.

6.5.2 LANDFILL SITES

None recorded within 500m of site.

6.6 HAZARDOUS SUBSTANCES

None recorded within 500m of site.

6.7 ECOLOGICAL RECEPTORS

The Groundsure report records the London Greenbelt as operated by the Hillingdon Borough Council located 163m, 224m and 868m north and 701m and 792m west of site.

No further sensitive land usages are recorded within 1000m of site.

6.8 SOILS AND GEOLOGY

"Contains British Geological Survey materials © NERC 2023" obtained from http://www.bgs.ac.uk/data/mapViewers/home.html under the Open Government Licence

6.8.1 SUPERFICIAL DEPOSITS

Both BGS geological mapping and the Groundsure report record superficial geological deposits of the Taplow Gravel Formation on site, comprising sands and gravels with local lenses of silt, clay or peat.

The Langley Silt Member is then recorded 111m north west of site and comprising variations of silts and clays.

6.8.2 SUPERFICIAL DEPOSITS PERMEABILTY

The Groundsure report records the site as being within an area where the maximum permeability of superficial deposits is recorded as ‘very high’ and the minimum permeability as ‘high’ and facilitated by intragranular flow mechanisms.

6.8.3 BEDROCK DEPOSITS

Both BGS geological mapping Groundsure report record bedrock geology of the London Clay Formation underlying site, comprising a bioturbated or poorly laminated, blue-grey or grey-brown, slightly calcareous, silty to very silty clay, clayey silt and sometimes silt, with some layers of sandy clay.

6.8.4 BEDROCK PERMEABILITY

The Groundsure report records the site as being within an area where the maximum permeability of bedrock geology is recorded as ‘moderate’ and the minimum permeability as ‘very low’ and facilitated by mixed flow mechanisms.

This is a qualitative classification of estimated rates of vertical movement of water from the ground surface through the unsaturated zone of any superficial deposits (the zone between the land surface and the water table).

6.8.5 ARTIFICIAL GROUND

BGS geological mapping records no artificial deposits located on or within 250m of site.

6.8.6 BGS ESTIMATED BACKGROUND SOIL CHEMISTRY

The Groundsure report records BGS background soil chemistry for the site. This is estimated values providing the likely background concentration of the potentially harmful elements Arsenic, Cadmium, Chromium, Lead and Nickel in topsoil. The values are estimated primarily from rural topsoil data collected at a sample density of approximately 1 per 2 km2. In areas where rural soil samples are not available, estimation is based on stream sediment data collected from small streams at a sampling density of 1 per 2.5 km2; this is the case for most of Scotland, Wales and southern England. The stream sediment data are converted to soil-equivalent concentrations prior to the estimation.

The Groundsure report records arsenic, lead & bioaccessible lead, cadmium, chromium and nickel at background concentrations of 15mg/kg, 100-200mg/kg & 60-120mg/kg, 2.2-3.0mg/kg, 60-90mg/kg and 15-30mg/kg, respectively.

Assuming a worst-case generic acceptance threshold (GAC) of 1% soil organic matter (SOM), none of the recordings are above the generic acceptance thresholds of 37mg/kg, 200mg/kg (both lead and bioaccessible lead), 11mg/kg, 910mg/kg and 180mg/kg, respectively; however, site soils may meet or exceed relevant thresholds when assessed for elevated lead levels.

6.8.7 BGS ESTIMATED BACKGROUND URBAN SOIL CHEMISTRY

Estimated topsoil chemistry of Arsenic, Cadmium, Chromium, Copper, Nickel, Lead, Tin and Zinc and bioaccessible Arsenic and Lead in 23 urban centres across Great Britain. These estimates are derived from interpolation of the measured urban topsoil data referred to above and

provide information across each city between the measured sample locations (4 per km2).

The Groundsure report records arsenic & bioaccessible arsenic, lead & bioaccessible lead, cadmium, chromium, copper, nickel and tin at background concentrations of 12mg/kg & 2.1mg/kg, 128mg/kg & 88mg/kg, 6.1mg/kg, 136mg/kg, 100mg/kg, 29mg/kg and 23mg/kg, respectively.

Assuming a worst-case generic acceptance threshold (GAC) of 1% soil organic matter (SOM), none of the recordings are above the generic acceptance thresholds.

6.8.8 COAL MINING

The site is not located in a coal mining reporting area and the local geology is not considered appropriate for such extraction. Therefore, the risk from coal mine related activities is considered to be negligible.

6.8.9 NON-COAL MINING

The Groundsure report records no non-coal mining operations within 500m of site. Review of historic OS maps have identified gravel pits in the wider area. The closest being located 300m west of the site and filled as a pond by circa 1897.

6.8.10 SURFACE WORKINGS

The Groundsure report does not record any surface working within 250m of site.

6.8.11 RADON

The property is not in a Radon Affected Area, as less than 1% of properties are above the Action Level. No radon protective measures are necessary as described in publication BR211:2015 by the Building Research Establishment.

6.9 AERIAL PHOTOGRAPHY

Aerial photography shows the following:

6.9.1 GOOGLE MAPS

The site is shown as located in a predominantly urbanised area and as occupied by a building and adjoined unit in the southern third of site with the remaining two thirds of site occupied by an overgrown garden area.

6.9.2 GOOGLE EARTH

Twenty-five images are held in the historical imagery dataset, as follows:

Date	Description
December 1945	The earliest maps are in black and white and not very detailed and the interior of the site is not clear; however, the surrounding residential development (Zealand Ave and Pinglestone Close) is recorded to the north, east. Bath Road is present to the immediately south of the site and Heathrow Airport, comprising a large airfield with certain parts still under construction, is present to the south across Bath Road. The village of Harmondsworth is present to the north.
December 1985	The map is blurred and not detailed.
September 1999	The site is observed in its current day layout with a single vehicle parked out front. The residential estate to the north and east is observed in its current day configuration. A restaurant is present immediately west of the site with a large structure (CCF Harmondsworth) located approximately 50m further west. Following Bath Road southwards are large surface level and multi-storey car parks, private hire companies and a hotel.
December 2003	No changes to site, two vehicles are present to the rear and along the eastern boundary. Nearby surrounding area remains unchanged.
July and September 2004	No significant changes other than vehicles movements onsite.
March and July 2005	No significant changes recorded onsite or surrounding area.

Date	Description
December 2006	No significant changes recorded onsite other than vehicles movements onsite. No changes to the surrounding area.
September 2008	No significant changes recorded onsite or surrounding area.
June and December 2010	No significant changes recorded onsite or surrounding area.
February 2010	Unable to determine site due to cloud cover.
March 2010	No significant changes recorded onsite or surrounding area.
July and August 2013	No significant changes recorded onsite or surrounding area.
June, October and November 2015	No significant changes recorded onsite or surrounding area.
April 2017	Rear garden is notably overgrown when compared to previous year.
May 2018	No significant changes recorded onsite or surrounding area.
June 2019	No significant changes recorded onsite or surrounding area.
April 2020	No significant changes recorded onsite or surrounding area.
March and April 2021	No significant changes recorded onsite or surrounding area.
March 2022	Clearance of vegetation with soil observed in rear gardens. Structures remain unchanged.
July 2022	Rear garden fence line seems to have been removed.

6.10 GOOGLE STREET VIEW

Google Street View imagery is dated March of 2022 with the site viewed off the A4 and facing north. The frontage of site can be seen with the remainder of site obscured by the site building itself. The site is fenced off from the roadside via heras fencing with a gravelled and concrete area forming the front of site. The building itself is boarded up and consists of two-storeys formed by a brick first-floor, wattle and daub second-floor and tiled roofing.

6.11 HISTORIC MAPPING

The following historical OS maps have been reviewed as part of this assessment, found in the appendices.

Map	Onsite	Offsite
OS County Series: 1866, 1:2,500	The site is recorded as set within a wider agricultural field with no discernible features in the site boundary.	The surrounding area of the site is set within a predominantly rural agricultural area with the villages of Longfield (900m W), Harmondworth (780m N) and Sipson (1.57km north east) present with the wider area. The Duke of Northumberland's River is located approximately 700m west at its closest point, and further eastwards The River Colne (827m west) is present. A gravel pit and pond are located approximately 320m and 295m to the west respectively.
OS County Series: 1865-1868, 1:10,560	No changes recorded.	No significant site-specific changes recorded.
OS County Series: 1896, 1:2,500	No changes recorded.	No significant site-specific changes recorded.
OS County Series: 1894-1897, 1:10,560	No changes recorded.	The gravel pit (320m west) has been converted into a pond. An additional gravel pit is located 510m south east of the
OS County Series: 1899, 1:2,500	No changes recorded.	No significant site-specific changes recorded.
OS County Series: 1898-1900, 1:10,560	No changes recorded.	No significant site-specific changes recorded.
OS County Series: 1912, 1:10,560	No changes recorded.	The pond located 295m west is no longer recorded and presumed backfilled.
OS County Series: 1912-1913, 1:10,560	No changes recorded.	No significant site-specific changes recorded.
OS County Series: 1914, 1:2,500	No changes recorded.	No significant site-specific changes recorded.

Map	Onsite	Offsite
OS County Series: 1934-1935, 1:10,560	The site has been developed with a single building occupying the approximate south centre of the site.	The area immediately north of the site has been developed into a residential estate. Additional residential properties are noted along Bath Road 470m east of the site. The gravel pit 510m south east of the site is no longer annotated and converted to a pond. Agricultural fields to the south have been converted into orchards and a large quarry is now present approximately 800m to the south.
OS County Series: 1935, 1;2,500	A smaller building is present in the rear of the property along the eastern boundary.	Residential properties have been developed 100m east of the site. Bath Road immediately south of the has expanded in size and a new junction is present west of the site.
OS County Series: 1935-1938, 1:10,560	No changes recorded.	Further residential infilling 125m north east of the site and within Harmondsworth.
Provisional: 1960-1964, 1:10,560	No changes recorded.	Heathrow Airport has been developed from 40m south of the site with auxiliary buildings present along Bath Road. A large factory has been built 47m to the west. A large depot is located approximately 800m south (annotated as a sewage works on later maps). The former gravel pit / pond located 320m west of the site is no longer recorded and presumed backfilled.
Provisional: 1960-1965, 1:10,560	No changes recorded.	No significant site-specific changes recorded.
National Grid: 1962-1966, 1:1,250	The building on site is annotated as a Post Office. An additional smaller structure is recorded along the eastern boundary.	Allotments gardens are now situated on the plots immediately east of the site, but no longer recorded by 1964 maps. A works is recorded 40m east and an offsite garage is now present at the western boundary of the site. A pond is located 85m north west within the nearby factory property.

Map	Onsite	Offsite
Provisional: 1970, 1:10,560	No changes recorded.	A warehouse and depot are now recorded 620m east of the site. Expansion of works 900m to the east.
National Grid: 1971-1973, 1:1,250	Two smaller structures have formed into a single building along the eastern boundary.	Three large commercial / industrial premises are recorded 90m south and 125m and 170m to the south east.
National Grid: 1973-1974, 1:10,000	No changes recorded.	Westwards expansion of Heathrow Airport to the south with associated Airport Hotel (480m south west) and car park (225m south). Additional development of buildings along Bath Road east of the site. A garage is recorded 460m to the east and a gravel pit is now present 920m west of the site.
National Grid: 1974, 1:1,250	No changes recorded.	No significant site-specific changes recorded.
National Grid: 1977, 1:1,250	No changes recorded.	The property immediately west adjacent to the site has been cleared and now annotated as a depot.
National Grid: 1978 to 1983, 1:1,250	No changes recorded.	The pond located 85m to the north west is no longer recorded.
National Grid: 1987, 1:10,000	No changes recorded.	The factory 47m to the west has been demolished and redeveloped as a Summit Centre with additional buildings 250m west of the site. A new car park is present 185m south west with an adjacent multi storey carpark present 130m south west. The gravel pit 920m west of the site is no longer recorded and presumed backfilled.
National Grid: 1987-1992, 1;1,250	No changes recorded.	No significant site-specific changes recorded.
National Grid: 1992-1993, 1:1,250	No changes recorded.	No significant site-specific changes recorded.

Map	Onsite	Offsite
National Grid: 2001, 1:10,000	No changes recorded.	A large structure (presently seen as a multi storey carpark), is now recorded 50m south of the site and adjoined to an already existing multi storey car park. Former structures from between 650m and 1km east of the along Bath Road has been cleared for a new surface level car park. A large structure annotated as Waterside has been developed 760m north west of the site with associated large-scale earthworks including the creation of Swan Lake 785m to the north west.
Landline: 2003, 1;1,250	No changes recorded.	No significant site-specific changes recorded.
National Grid: 2010, 1:10,000	No changes recorded.	Buildings from between 80m and 280m south east of the site has been cleared and developed into a new car park. Sewage works 800m south is longer recorded as Heathrow Airport has expanded westwards over the feature. A prison is now recorded 490 north west in paced of former government buildings.
National Grid: 2022, 1:10,000	No changes recorded.	No significant site-specific changes recorded.

6.12 CURRENT LAND USE DATA

ID	Distance [m]	Direction	Company	Activity	Category
2	68	NW	Electricity substation	Electrical features	Infrastructure and facilities
3	100	NE	Eagle One Logistics Ltd	Distribution and haulage	Transport, storage and delivery
4	120	NW	Electricity substation	Electrical features	Infrastructure and facilities
5	156	SW	Electricity substation	Electrical features	Infrastructure and facilities
6	196	W	Electricity substation	Electrical features	Infrastructure and facilities
A	201	NW	Medequip Assistive Technology	Medical equipment, supplies and haulage	Industrial products
A	201	NW	Saints Transport Ltd	Distribution and haulage	Transport, storage and delivery
A	201	NW	Unicorn Shipping Ltd	Distribution and haulage	Transport, storage and delivery
B	203	E	Mast	Telecommunications features	Infrastructure and facilities
C	204	SW	Electricity substation	Electrical features	Infrastructure and facilities
B	209	E	Electricity substation	Electrical features	Infrastructure and facilities
7	210	N	Electricity substation	Electrical features	Infrastructure and facilities
8	210	E	A P R Fire Alarm Services Ltd	Electronic equipment	Industrial products
C	246	SW	Electricity substation	Electrical features	Infrastructure and facilities
9	229	W	Europcar	Vehicle hire and rental	Hire services
A	229	NW	Electricity substation	Electrical features	Infrastructure and facilities

6.13 PETROL AND FUEL SITES

The Groundsure report records an active Shell garage located 295m west of site.

6.14 HISTORICAL PETROL AND FUEL SITE DATABASE

None recorded within 500m of site.

6.15 POTENTIAL CONTAMINATIVE LAND USES IDENTIFIED ON MAPPING

ID	Distance [m]	Direction	Use	Date
2	27	S	Unspecified commercial / industrial	1974-1987
A	41	S	Unspecified works	1970
B	47	NW	Unspecified factory	1970-1974
B	50	W	Unspecified commercial / industrial	1959
B	63	NW	Unspecified tank	1970-1974
C	105	S	Unspecified depot	1987
D	105	S	Airport	1959
D	105	S	Airport	1964-1966
E	181	SW	Unspecified depot	1974

6.16 HISTORICAL TANK DATABASE

ID	Distance(m)	Direction	Use	Date
B	70	NW	Unspecified tank	1987
C	78	SW	Unspecified tank	1977-1993
A	180	S	Tanks	1977-1997

6.17 HISTORICAL ENERGY FACILITIES

ID	Distance(m)	Direction	Use	Date
3	56	SE	Electricity substation	1977-1997
B	72	NW	Electricity substation	1992
B	92	NW	Electricity substation	1964
C	125	S	Electricity substation	1977-1997
4	155	SW	Electricity substation	1997
C	171	S	Electricity substation	1997
E	176	SW	Electricity substation	1977-1993
E	200	SW	Electricity substation	1997
5	204	E	Electricity substation	1972-1993
6	207	N	Electricity substation	1967-1992
F	216	NW	Electricity substation	1978
F	226	NW	Electricity substation	1987-1992

6.18 HISTORICAL GARAGE DATABASE

The Groundsure report records a historical garage located within the adjacent property west of the site and identified from historical mapping dated circa.1962 to 1966.

7.0 POLLUTANT LINKAGE ASSESSMENT

The risk posed by any contaminants in soil or groundwater will depend on the nature of the hazard, the probability of exposure, the pathway by which exposure occurs, and the likely effects on the receptors. A contaminant is defined as a substance that has the potential to cause harm, while a risk is considered to exist if such a substance is present in sufficient concentration to cause harm and a pathway exists for a receptor to be exposed to the substance.

The following sections discuss all the identified potential on and off-site sources, pathways and receptors in the context of the proposed development and plausible pollutant linkages which may represent a risk to identified receptors from the data gained from the desk study. At this stage the assessment is qualitative and aimed to determine all pollutant linkages, irrespective of significance or allowing for uncertainty.

Three impact potentials exist for any given site, these are:

- The site impacting upon itself;
- The site impacting on its surroundings; and
- The surroundings impacting on the site.

All three impacts need to be considered in a risk assessment.

7.1 SOURCES

The following potential sources of contamination have been identified.

7.1.1 ONSITE

- Historical agricultural use of the site (circa. 1865 to 1934).
- Made ground associated with current building onsite (circa. 1934).

- Unknown use of building (circa. 1934 to 1964), after which the site has been used as a post office and convenience shop, circa. 1964 to March 2022 when the shop is noted as bordered up and fenced off on historical google maps street view.
- Potential asbestos containing materials within the fabric of the building, given the age structure (pre-1999).
- An area of hardcore crush is present at the western frontage of the building. The source of the material is unknown and may contain asbestos.

7.1.2 OFFSITE

- Garage recorded on adjacent property west of site (circa. 1962 to 1966 after which it is no longer recorded). Groundsure reports this feature as onsite, but after review it is considered part of a separate property.
- Unspecified factory 47m north west (circa. 1960 to 1983).
- Offsite pond (circa. 1962 to 1978), pond is considered to be man-made and first appeared within grounds of larger factory premises after construction.
- Infilled pond 295m west (circa. 1866 to 1912)
- Infilled gravel pit / pond 320m west (circa. 1868 to 1964)
- Allotment gardens located immediately east of the site (circa. 1962 to 1964).
- Unspecified works adjacent east of the site (circa. 1964 to 1983).
- Current Electrical substation located 68m south west. Historical substations within 100m of the site include; 92m north west (circa. 1973 to 1983), 56m north west (1977 to 1997) and 72m north west (1992).

7.2 PATHWAYS

A pathway is defined as a mechanism or route by which a contaminant comes into contact with, or otherwise affects a receptor. Pathways by which the identified receptors may be impacted upon in the context of the proposed development are identified as follows:

- Ingestion;
- Skin contact;
- Inhalation;
- Plant uptake,
- Direct contact by buried structures;
- Leaching of soluble contamination into groundwater

7.3 RECEPTORS

Receptors are defined as people, living organisms, ecological systems, controlled waters, atmosphere, structures and utilities that could be adversely affected by contaminant(s).

- Human Health
  - Current users of the site;
  - Future users of the site;
  - Users of neighbouring sites;
  - Construction workers; and
  - Services personnel working in trenches.
  - Construction Materials
- Buried concrete, which may be affected by high concentrations of sulphate and/or low pH, in the soils and groundwater underlying the site; and
- Buried water pipes.
- Controlled Waters
- Ecological Receptors
- Flora and fauna using the proposed development

8.0 CONCEPTUAL SITE MODEL

The Conceptual Site Model (CSM) is a hypothesis of the nature and sources of contamination, potential receptors that may be the recipient of contamination arising from those sources and any pathways that may exist. It creates a plausible source-pathway-receptor pollutant linkage (hazard), set within the context of the ground and proposed end use of the site.

8.1 PRELIMINARY CONCEPTUAL SITE MODEL

8.1.1 SOIL CONTAMINATION

The is currently occupied by a single two storey brick, wood and daub façade building with a smaller garage present adjacent. Historically the site was formed of agricultural field until circa. 1934, after which the residential / post office structure was constructed. Minor alteration, in the form of the addition to the attached eastern garage structure, was added by 1973. The building had an unknown usage (presumed to be residential) until becoming a post office and convenience shop in circa. 1964. The site generally remained unchanged until recently when it was no longer in use and boarded up by May 2022. Generally, there a few onsite sources of significant contamination; however, asbestos containing materials are likely to have been used given the age of the building, and limited amounts of made ground can be expected beneath the site associated with its initial construction.

Previous agricultural use of the site is also a potential source of contamination; however, no agricultural buildings have been present within the site boundary before development the site to 1866, when the land was situated on the edges of open agricultural fields and it is considered that no agricultural buildings or yards were present within the site. Therefore, the risk of significant contamination associated with agricultural use of fuels, oils and lubricants is considered to be low. However, there remains a potential for pesticide contamination from both former agricultural use and a recorded historical allotment which were once present along the eastern boundary of the site.

Significant offsite sources of contamination include potential hydrocarbon contamination associated with a garage formerly present on the adjacent property west of the site, potential contamination associated a historical factory and unspecified works within 47m west of the site and potential pesticide contamination associated with allotment garden formerly present along the eastern boundary of the site which has since been developed with residential properties and electrical substations which have historical

and currently been situated in the vicinity of the site; however, no sub-stations have been recorded within the site, and therefore the risk from these features are considered to be low. Lastly, the area of hardcore crush at the frontage of the building may be formed of imported soils, which is generally comprised of inert material, however it would prudent to undertaken asbestos testing on the material to confirm any associated risk.

8.1.2 HAZARDOUS GROUND GAS AND VAPOURS

Made ground associated with the initial construction of the residential / post office structure is expected. Offsite ponds and an infilled gravel pit have both been identified as potential sources of ground gas. No onsite sources of hazardous hydrocarbon have been identified; however, a historical offsite repair garage has been identified adjacent the western boundary and currently considered a moderate offsite risk of hydrocarbon vapours.

TABLE 1. SUMMARY OF SIGNIFICANT POLLUTION LINKAGES

Contaminant	Pathway	Receptor	Probability of Pollutant Linkage	Consequence	Risk	Possible Mitigation
Contaminated Soils *(Made Ground, historical agricultural use, historical offsite garage, existing crushed hardcore, pesticides)*	Direct Ingestion & Direct Contact	Site Workers	Li	Md	M	Site workers to wear appropriate PPE for health and safety reasons, usage and adherence to relevant HSE guidance during site works is considered suitable to reduce this risk to low during site works. As PACMs could be present within the building fabric of the building, the risk is currently moderate. Following an asbestos survey and controlled removal of ACMs, if encountered, will allow for the risk to be reduce to low. Limited made ground is expected to be present beneath the site, however there is also the potential for hydrocarbon contamination from offsite sources. Based upon the development plans provided, private gardens will be placed to the rear of the development and soft landscaping borders will also be present. As such chemical sampling is recommended in order to confirm the suitability and condition of the shallow soils that will remain in these areas. At this stage, it is recommended that a Phase II is carried out onsite, including a generic soils suite along with TPH CWG, BTEX and MTBE along with screening for potential asbestos. An area of crushed hardcore is present at the building's frontage. Crushed material is usually inert, however as the source of the material is unknown, it is recommended that an asbestos screen is undertaken on the material. Any new potable water services are at risk of degradation of onsite, specifically from PAHs. Further assessment of risk to be undertaken as part of Phase II Site Investigation.
Contaminated Soils (*Made Ground, historical agricultural use, PCAMs, historical offsite garage, existing crushed hardcore, pesticides)*	Inhalation of Dust	Site Workers	Li	Md	M	
Contaminated Soils (*Made Ground, historical agricultural use, historical offsite garage, existing crushed hardcore, pesticides)*	Direct Ingestion & Direct Contact	End Users	Li	Md	M	
Contaminated Soils (*Made Ground, historical agricultural use, PCAMs, historical offsite garage, existing crushed hardcore, pesticides)*	Inhalation of Dust	End Users	Li	Md	M	
Contaminated Soils (*Made Ground, historical agricultural use, PCAMs, historical offsite garage, existing crushed hardcore, pesticides)*	Direct Ingestion	Flora and Fauna	Li	Md	M	
Contaminated Soils (*Made Ground, historical agricultural use, historical offsite garage, existing crushed hardcore, pesticides)*	Vertical and lateral migration	Controlled Waters	Li	Md	M	
Contaminated Soils (*Made Ground, historical agricultural use, PCAMs, historical offsite garage, existing crushed hardcore, pesticides)*	Direct contact	Services	Li	Md	M	

Contaminant	Pathway	Receptor	Probability of Pollutant Linkage	Consequence	Risk	Possible Mitigation
Ground Gases (Methane and CO_2) (made ground, infilled ponds and gravel pit)	Vertical and lateral migration	End Users & Building Envelope	Ul	Md	L	Made ground are considered to be present beneath the site. Given the recorded development history of the site, it is considered to be limited amounts and any gas generation should have been significant reduced or ceased by the present day. Similarly, offsite ponds and gravel pits have been identified within the surrounding area; however, given the age of the backfilling and length of gassing period, they are not considered significant offsite sources of ground gas.
Volatile and Semi-volatile Organic Compounds (*Made Ground, historical agricultural use, historical offsite garage)*	Vertical and lateral migration	End Users & Building Envelope	Li	Md	M	Potential source of VOC/SVOCs have been identified in the form of an offsite garage along the western boundary – recommend further investigation as part of Phase II SI.
Radon	Vertical and lateral migration	End Users & Building Envelope	Ul	Md	VL	Site is not recorded to lie within a Radon Affected Area.

KEY: Probability of pollutant linkage Hi = Highly likely, Li = Likely, Lw = Low Likelihood, Ul = Unlikely
Consequence Sv = Severe, Md = Medium, Mi = Mild, Mr = Minor,
Overall Risk VH = Very High, H = High, M = Moderate, M/L = Moderate/Low, L = Low, VL = Very Low

Based on the preliminary CSM for the site, an environmental risk assessment has been undertaken. A simple matrix can provide a consistent basis for decision making. It should be used with caution, recognising the over-simplification that it will normally represent. The probability and consequences are defined according to parameters relevant to the situation; the boundaries of risk acceptability (and tolerability, where relevant) indicated on the matrix provided in Table 2, can be tailored to the factors influencing the significance of the risk. Individual situations are mapped onto the matrix to provide a ready and consistent indication of their acceptability or tolerability.

TABLE 2. RISK CLASSIFICATION MATRIX

		Consequence			
		Severe (Sv)	**Medium (Md)**	**Mild (Mi)**	**Minor (Mr)**
Probability	**High (Hi)**	Very high risk	High risk	Moderate Risk	Moderate/ Low Risk
	Likely (Li)	High risk	Moderate Risk	Moderate/Low Risk	Low Risk
	Low Likelihood (Lw)	Moderate Risk	Moderate/ Low Risk	Low Risk	Very Low Risk
	Unlikely (Ul)	Moderate/ Low Risk	Low Risk	Very Low Risk	Very Low Risk

Source: CIRIA Report C552, Contaminated Land Risk Assessment. A Guide to Good Practice, 2001

These attributes are evaluated qualitatively against individual hazard assessments to determine the likelihood of a given hazard occurring. The risk evaluations for each plausible pollutant linkage are given in the last three columns of Table 1.

TABLE 3. CLASSIFICATION OF RISK

Very high risk (Vh)	There is a high probability that severe harm could arise to a designated receptor from an identified hazard, OR, there is evidence that severe harm to a designated receptor is currently happening. This risk, if realised, is likely to result in a substantial liability. Urgent investigation (if not undertaken already) and remediation are likely to be required.
High risk (Hi)	Harm is likely to arise to a designated receptor from an identified hazard. Realisation of the risk is likely to present a substantial liability. Urgent investigation (if not undertaken already) is required and remedial works may be necessary in the short-term and are likely over the longer term.
Moderate risk (Md)	It is possible that harm could arise to a designated receptor from an identified hazard. However, it is either relatively unlikely that any such harm would be severe, or if any harm were to occur it is more likely that the harm would be relatively mild. Investigation (if not already undertaken) is normally required to clarify the risk and to determine the potential liability. Some remedial works may be required in the longer-term.
Low risk (Lw)	It is possible that harm could arise to a designated receptor from an identified hazard, but it is likely that this harm, if realised, would at worst normally be mild.
Very low risk (Vl)	There is a low possibility that harm could arise to a receptor. In the event of such harm being realised it is not likely to be severe.

Source: CIRIA Report C552, Contaminated Land Risk Assessment. A Guide to Good Practice, 2001

9.0 ENVIRONMENTAL RISK ASSESSMENT

Based on the information contained in this report, it is the opinion of Castledine Environmental that the site represents a **LOW TO MODERATE** risk with respect to the proposed development.

It is recommended that remediation in-line with section 14 is undertaken

It is recommended that the buildings on site should be subject to an asbestos survey and removal by appropriately qualified personal prior to any demolition or redevelopment occurring in order to ensure site works do not cause future contamination of the site.

This report should be submitted to your Local Planning Authority for agreement to allow the Phase 2 intrusive testing to be undertaken.

10.0 SUMMARY OF RISKS

11.0 HUMAN HEALTH

11.1.1 SITE WORKERS

The risk to site workers is considered to be moderate due to the potential for asbestos contamination along with the potential presence for hydrocarbon impacted made ground. The provision and considered usage of PPE and adherence to relevant HSE guidance is recommended, and following an asbestos survey and controlled removal or any impacted material, the risk from asbestos contamination can be reduce to low.

11.1.2 RESIDENTS / END-USERS

The risk to end-users of the proposed development is considered to be moderate when assessed against the sensitive, residential end-usage of the site. Areas of private gardens and soft landscaping are proposed. Should onsite soils be used be present beneath these areas there exists a credible pathway for contamination to impact end-users. Additionally, the potential for hydrocarbon impact to new potable water supply piping is considered a hazard to end-users of the stie via impacted supply pipes.

12.0 CONTROLLED WATERS

The risk to controlled waters are considered to be moderate. Should significantly contamination be present within the made ground onsite, it will have a direct contact with the underlying Principal Aquifer (Superficial Taplow Gravel Member) thus providing a potential pathway for impact to controlled waters.

13.0 STRUCTURES

13.1.1 GROUND GAS AND HAZARDOUS VAPOURS

No significant sources of ground gas have been identified within the site. Made ground and an infilled ponds north west have been discounted as significant sources of ground gas due to their age and likelihood that significant gassing should have reduce or ceased by the present day.

Due to the potential for hydrocarbon contamination to be present onsite associated with the historic garage formerly presence along the eastern boundary, there is the potential for hazardous vapours to via the building envelope should a significant release of spillage have occurred.

13.1.2 POTABLE WATER SUPPLY PIPING

Due to the potential for PAH and hydrocarbon associated with the historical garage, there is the potential for impact new potable water supply piping.

13.1.3 OFF SITE RECEPTORS

The site is located adjacent to surrounding residential and commercial premises, the potential offsite impact from onsite sources is considered to be low and asbestos surveys and testing should be carried out prior to any site works or redevelopment occurring, to prevent the potential mobilisation of asbestos dusts and fibres during the works.

13.1.4 WASTE CLASSIFICATION

Due to the potential for made ground deposit, hydrocarbon impacted soils and asbestos contamination, any arising for site works, excavations or remediation should be WAC (waste acceptance classification) tested, to ascertain the suitability of the material for disposal purposes.

- Any waste generated during the site works will need to be disposed of at a suitable and accredited landfill and in accordance with current waste regulations.
- Results of any WAC testing should be given to relevant waste/landfill site so they can be reviewed by a qualified waste assessor.

14.0 RECOMMENDATIONS

It is recommended that an intrusive Phase II Site Investigation is planned and carried out on site. This should involve trial pits across the site, to facilitate the assessment of ground conditions (i.e. made ground, natural or reworked deposits, their nature, extent and depth) alongside the taking of environmental samples for laboratory analysis. Environmental sampling should include a generic suite across the site (i.e. metals, metalloids, PAHs and phenol) with additional of TPH CWG and BTEX and MTBE

testing due to the period the offsite garage was present (1962 to 1966) Provision should be made for PID (photo-ionisation detector) usage during the site works, both within excavations and sample headspace. The combinations of these works will allow for updating the Conceptual Sute Model (CSM), granting understating of the ground conditions, any impact the site's history may have had on site soils and any associated, potential impact on the site proposal / extent of remediation required.

A watching brief (as outlined in Appendix E) should be carried out by the site supervisor during the course of demolition, site clearance and construction works for any obvious contamination (e.g. oil spillage in ground, buried waste, possible asbestos containing material). Should previously unreported or undiscovered contamination be identified, then development should stop and Castledine Environmental should be contacted to determine if further assessment or changes to the remediation scheme are required.

15.0 REFERENCES

15.1 LEGISLATION AND REGULATIONS

15.1.1 ACTS

[1] Environmental Protection Act 1990, Part IIA: inserted by Environment Act 1995, Section 57. See Environment Act 1995 for text of Part IIA.

15.1.2 PLANNING REGULATIONS

[2] The Town and Country Planning (Environmental Impact Assessment) (England and Wales) Regulations 1999 SI1999/No.293

[3] The Town and Country Planning (Environmental Impact Assessment) (England and Wales) (Amendment) Regulations 2000 SI2000/No.2867

15.1.3 CONTAMINATED LAND REGULATIONS

[4] The Contaminated Land (England) Regulations 2000. SI2000/No.227

[5] The Contaminated Land (England) (Amendment) Regulations 2001 SI2001/No.663

[6] The Contaminated Land (England) Regulations 2006 SI2006/No.1380

15.2 STATUTORY GUIDANCE

[7] Department of Environment, Food and Rural Affairs. 2012. *Environmental Protection Act 1990: Part 2A Contaminated Land Statutory Guidance.* Department of Environment, Food and Rural Affairs

[8] Communities and local Government, 2018: National Planning Policy Framework.

15.3 BRITISH STANDARDS

[9] BS 5930:2015 Code of practice for site investigations

[10] BS 10175:2011+A2:2017 Investigation of potentially contaminated sites - Code of practice

[11] BS 8485:2015+A1:2019 BS 8485 - 2015 - Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings

[12] BS 8576:2013 Guidance on investigations for ground gas. Permanent gases and Volatile Organic Compounds (VOCs)

15.4 NON STATUTORY TECHNICAL GUIDANCE

15.4.1 ENVIRONMENT AGENCY

[13] Cassella Stranger, 2002. Model Procedures for the Management of Contaminated Land, Contaminated Land Report (CLR) 11, Department for Environment, Food, and Rural Affairs.

15.4.2 CIRIA PUBLICATIONS

[14] Wilson, S., Oliver, S., Mallett, H., Hutchings, H., and Card, G.. 2007, *C 665 Assessing risks posed by hazardous ground gases to buildings* London: Construction Industry Research and Information Association

[15] Mallett, H., Cox, L., Wilson, S. and ,Corban M... 2014, *C 735 Good practice on the testing and verification of protection systems for buildings against hazardous ground gases* London: Construction Industry Research and Information Association

15.4.3 CL:AIRE

[16] Card G, Wilson S, Mortimer S. 2012. *A Pragmatic Approach to Ground Gas Risk Assessment. CL:AIRE Research Bulletin RB17*. CL:AIRE, London, UK. ISSN 2047- 6450 (Online)

16.0 APPENDICES

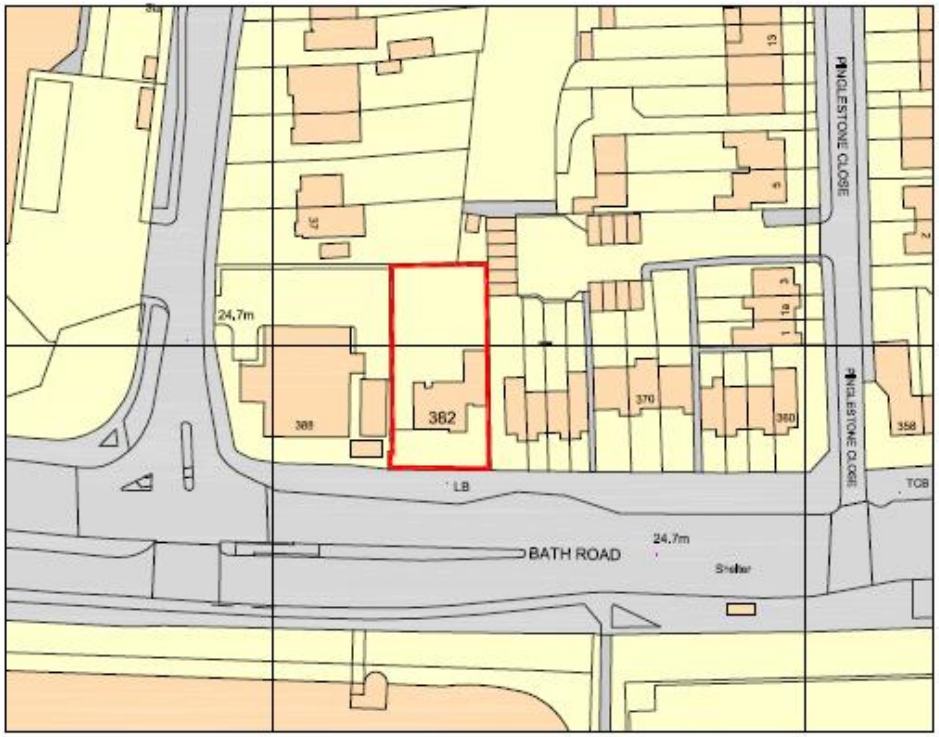
APPENDIX A **ENVIRONMENTAL SEARCH**

Separate Groundsure Report

APPENDIX B **HISTORICAL MAPPING**

Separate Map Packs (2 No. files)

APPENDIX C **PROPOSED AND CURRENT SITE PLANS**



location plan

Scale 1:1250 @ A3

0 20 50 120

APPENDIX D SITE PHOTOS

Castledine Environmental
LAND CONTAMINATION SURVEYS

Site Walkover Photos

Address: No. 382 Bath Road, Heathrow, London UB7 0DH
Client: Mr. J. Verma

Photo No.1: View facing north from Bath Road of No. 382 frontage, dated October 2022

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Photo No.2: View facing northwards of rear gardens, dated July 2021

Castledine Environmental, 4 Wymeswold Road, Hoton, Loughborough, Leicestershire. LE12 5SN
Telephone: 01509 880399 **Mobile:** 07779 305682 admin@castledine.co

Castledine Environmental
LAND CONTAMINATION SURVEYS

Site Walkover Photos

Address: No. 382 Bath Road, Heathrow, London UB7 0DH
Client: Mr. J. Verma

Photo No.3: View of western access track to rear of property, dated July 2021

Castledine Environmental, 4 Wymeswold Road, Hoton, Loughborough, Leicestershire. LE12 5SN
Telephone: 01509 880399 **Mobile:** 07779 305682 admin@castledine.co

APPENDIX E WATCHING BRIEF

It remains possible that previously unexpected soil conditions may be encountered during the construction process. Examples may include oily pockets within the soil, potential for asbestos containing materials, black ashy materials, soils exhibiting strong odours, brightly coloured materials, and former demolition materials.

Should previously undiscovered contamination be encountered during the demolition/construction of the new buildings the following course of action should be adhered to:

1. The ground workers should report any suspected contamination immediately to the Client's site supervisor. The supervisor should contact the Client or their appointed agent who will in turn contact Castledine Environmental to request an engineer to visit the site to assess the extent of the 'contamination'.
2. Castledine Environmental shall make records of their inspection, and pass details of these to the Local Authority.
3. Where the conditions revealed differ from those previously anticipated, the Castledine Environmental shall take samples as deemed appropriate to be dispatched for appropriate chemical testing.
4. Depending on the results of the testing either:
    a. no further work will be required;
    b. a further detailed risk assessment will be required; and/or
    c. Localised specific remedial measures will be necessary. Appraisal criteria will vary depending on the nature of the assessment.
5. The results of any such testing will be sent to the Local Authority Pollution Control Section, Local Authority development control section, and the appointed building inspector. If remediation is required, the LA/Building inspector will be informed of the date and time of the proposed works.

6. Remediation will be undertaken in accordance with a method statement submitted for approval. The works shall be supervised where necessary by Castledine Environmental who shall provide a Verification Report for the Local Authorities.
7. A copy of the discovery strategy should be lodged on site and provisions made to ensure that all workers are made aware of their responsibility to observe, report and act on any potentially suspicious or contaminated materials they may encounter.

APPENDIX F DISCOVERY STRATEGY