HATTON GARDEN PROPERTIES LIMITED

PHASE 1 DESK STUDY
WALKOVER SURVEY
AND
ENVIRONMENTAL RISK ASSESSMENT
72-80 LEATHER LANE
LONDON EC1N 7TR

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Cameron Environmental

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1.0 INTRODUCTION

Cameron Environmental was instructed by Smith Caradoc-Hodgkins Architects Ltd on behalf of their Client; Hatton Garden Properties Limited, to carry out a Phase 1 Desk Study and Walkover Survey of the site and current building (known as 'City House') occupying 72-80 Leather Lane London, EC1N7TR. At the time of the walkover survey, which was undertaken on 6th October 2016, the site was occupied by a eight-storey building, (including current basement area and occupied attic areas), which was being utilised for mixed retail, residential, commercial and workshop-type occupancy. The commission comprised the undertaking of a Landmark Envirocheck Survey of the site, a copy of which is provided in Appendix 6 of the current Report.

It is understood that the Client proposes to undertake refurbishment of the building, whilst retaining the current range of uses and also extending the building height to nine-storeys (including ground-floor and basement) on the rear (eastern) section. Drawings showing the approximate site location, the current site/floor layout and usage and the proposed redesigned and extended layout and usage of the buildings currently occupying 72-80 Leather Lane are presented in Appendix 1 of the current Report.

There are no known earlier similar studies of the site which have been made available for review as part of the current study, although a summary of a 'Heritage Assessment' of the site undertaken by Squire Heritage Consulting, dated 6th October 2016 has been provided by Smith Caradoc-Hodgkins Architects Ltd for review as part of this study.

2.0 LAND USAGE

2.1 Site Location

The proposed development site was situated on a corner block towards the intersection of Hatton Wall and Leather Lane within the Hatton Garden area of London. The actual corner was occupied by a licensed premises identified as 'Public House - Craft Beer Company'. The existing building occupying the 72-80 Leather Lane was roughly 'L' shaped, and occupied a total area of very approximately 0.025ha.

2.2 Site Description and Observations

The existing building occupying 72-80 Leather Lane appeared to be of brick construction, with a pitched tile roof, and occupied eight floors including attic area and a basement. At the time of the current study and walkover survey, the existing building had been sub-divided on each of the floors into separate units which were utilised for either; retail, residential or commercial workshop type usage. The principal access to these floors was through a doorway located between 76 and 78 Leather Lane. More specifically, the identified uses included:

2.2.1 Retail Units on Ground Floor

These included:

- Fullcity Cycles Ltd occupying 72 Leather Lane;
- Diamond Nail Bar occupying 74 Leather Lane;
- Rogers (Barbers) – occupying 76 Leather Lane;
- GAB - Luggage, repairs and bag retailers 78 Leather Lane;

2.2.2 Commercial Usage

These included:

- Andreas Von Einsiedel – Interior Photography;
- Fourth Floor Music.

Office/commercial usage was noted on the 3rd Floor only.

2.2.3 Residential Usage

This included residential flats occupying sections of the 1st, 2nd, 4th, 5th and 6th Floors. These, it is understood, were in occupation at the time of the walkover survey.

2.2.4 Jewellery Workshops

These included:

- Ironforge Ltd;
- City Gold Plating;
- FOS Jewellery.

The walkover survey was concentrated on the premises being utilized as Jewellery Workshops, and on accessible outside areas (a Light Well and fire escape area) accessed from within the central section of the existing building. These were areas where it was considered that there was the greatest potential for contamination to occur or be visually evident.

Jewellery Workshops accessed included:

2.2.4.1 Ironforge Ltd

This workshop was being used for jewelry crafting, metal and jewel abrasion and contained furnaces/ovens for fusing metals, glasses and glazes. Sacks of materials including borax and fluorspar were noted to be present within the workshop. There was no visual evidence of significant contamination present across the workshop floor.

2.2.4.2 City Gold Plating

This workshop undertook metal plating activity, principally gold, silver as well as other precious metals. Plating appeared to be undertaken using electro-plating baths, with solutions made up, it is understood using de-ionised water and dry-stored reagents. There was no visual evidence of significant contamination present across the workshop floor. It was understood that formerly this workshop had been used as photographer's darkroom.

2.2.4.3 FOS Jewellery

This workshop was in very active use at the time of the walkover survey, being used for jewellery crafting, which including metalwork and jewel mounting and repairs. There were a number of furnaces in use and jewel/metal polishing activity appeared to be carried out using abrasive compounds and mechanical grinding/sanding wheels.

2.2.5 External Areas

These areas included a Light Well and fire escape. It was noted that water was overflowing from a downpipe and discharging into a partially-open manhole (with possible entry to foul sewer) located within the Light Well. The discharging water was turbid, and discoloured milky white. Other than the discharging water which appeared to have stained some areas of the floor and wall area within this Light Well, there was no other visual evidence of significant contamination in these areas. All external areas were noted to be laid to hardstanding.

2.3 Surrounding Land Usage

The site was situated within an area laid mainly to retail, residential and commercial usage comprising building of wide age range. New development was taking place on the northern side of Hatton Wall, to the immediate north north east of the study site.

Surrounding ground levels were generally similar to that of the study site, the area generally being relatively flat.

Photographs of the site and immediate surroundings are provided in Appendix 2.

2.4 Asbestos in Buildings

This survey did not include a detailed asbestos survey of the site and buildings. If not undertaken already, it is recommended that a 'Refurbishment and Demolition Survey' for asbestos present on the site be carried out prior to any building demolition/alteration/refurbishment works, and reported under separate cover.

2.5 Proposed Refurbishment Works

Although much of the refurbishment work will be undertaken above ground floor level, it is understood that there is likely to be some disturbance to ground level and basement floors and walls within the building footprint. These works may include the need for piling (underpinning) of two short lengths of existing wall and the excavation of a small area of basement, to lower the floor level slightly in this area. The locations of these potentially affected areas are marked on a Drawing which is also presented in Appendix 1.

2.6 Ecological Considerations

A formal ecological survey of this site is beyond the scope of this study.

3.0 TRADE DIRECTORY INDUSTRIES

The environmental data search seeks to identify active or inactive industrial processes that are currently operating or have operated historically within the vicinity of the site.

Six (No.) on-site active and inactive trade directory entries have been identified for the site. These include:

- Ironforge Ltd - Precious Metal Recovery (active);
- City Gold Plating (active);
- Tov Castings Ltd - Jewellery Manufacturers & Repairers (inactive);
- FOS Jewellery - Jewellery Manufacturers & Repairers (active);

- Momo - Jewellery Manufacturers & Repairers (inactive);
- Memis Gold - Jewellery Manufacturers & Repairers (inactive).

Within 0-250m of the site there are indicated to be 9 (No.) and between 251-500m 15 (No.) trade directory entries.

The nearest active entries relate to the following processes:

- A further four (No) Jewellery Manufacturers & Repairers present within approximately 3m of the site (all inactive);
- Cartouche UK London Ltd (Printers) and Oldacres & Co Ltd (Printers) both located approximately 23m to the east of the study site (both inactive);
- Suit Smart (dry cleaners) located approximately 23m to the north west of the site (active);
- A further (active) Jewellery Manufacturer & Repairer identified as 'Goldfinger', located approximately 30m to the north of the site. Further inactive Jewellery Manufacturer & Repairers are also identified within this radius;

The Landmark Survey also indicates that there are no active/open fuel station sites within 1km of the site. The nearest former fuel station entry is indicated to be located at 96-100 Clerkenwell Road, Clerkenwell, London, EC1M 5RJ, approximately 337m to the north east of the study site.

4.0 HISTORICAL USAGE

Historical information on the usage of the site, and that of the immediate surroundings, has been obtained from historical Ordnance Survey maps obtained as part of a Landmark Envirocheck Survey of the site.

A study of historical Ordnance Survey maps (Appendix 3) has been undertaken to identify any former land uses at the site and surrounding areas which may have geotechnical or geo-environmental implications for the proposed development and is summarised in Table 4.1

Additional information (and greater detail) has been provided in a 'Heritage Assessment' of the site undertaken by Squire Heritage Consulting, dated 6th October 2016. A copy of this document is provided in Appendix 4 of the current Report.

Table 4.1– Details of Former Usage of Site and Immediate Surroundings obtained from Historic Maps Reviewed and information supplied in Squire Heritage Consulting Report

Map Edition	Key Features on Site	Key Features off Site
1590	Orchard and subsequently ornate garden	Development of housing and inns from early 17 Century onwards.
Mid 1600s - 1760s	Buildings constructed on study site and by 1760s were occupied by prosperous merchants	Further development of housing and inns, with area becoming fully developed by about 1666.
1851 map scale -1:5,280	None identified although the predominant residential usage of this building(s) was changing as jewellery and gem traders moved in.	Leather Lane and Hatton Wall identified and Metropolitan Railway Line shown on ground approximately 200m to the east of the site.
1874 - 1875 scale -1:1,056	Site now developed with undetermined buildings - although likely to be retail and office usage at ground floor and jewellery and gem traders (and possibly residential)	Surrounding land is all shown to be developed. Ground to the immediate south east identified as being used as a 'Saw Mill'. Ground to the north of the site on

	on upper floors. In the last quarter of the 19th century, the land site to the rear of no 72- 80 appears to have comprised a Warehouse, with the study site comprising a wide plot that linked into a Saw Mill on its southern/south eastern side.	opposite side of Hatton Wall identified as being used as a 'Warehouse' and ground to the north west on opposite side of Portpool Lane is established by a 'Brewery'. A Public House is shown to be present on ground adjoining the northern side of the study site at a location similar to that of the current 'Craft Beer Company Public House'.
1877 - 1878 map scale - 1:2,500	Site remains developed with undetermined buildings of similar layout to previous map reviewed.	No significant changes to use of immediate surrounding land.
1896 map scale - 1:1,056	Site remains developed with undetermined buildings of similar layout to previous map reviewed. However, it appears that the study site has been subdivided into two separate buildings with an alley located between, that may well have acted as access for loading and deliveries to the Saw Mill.	Some changes are shown to the usage of immediate surrounding ground, with the 'Warehouse' to the north of the site on opposite side of Hatton Wall, now identified as 'Brewery' and the 'Saw Mill' formerly present on ground to the immediate south east of the site no longer identified.
1916 map scale - 1:2,500	Site remains developed with undetermined buildings of similar layout to previous map reviewed. Two (No.) additional floors have been added on to the building by 1922.	Some changes are shown to the usage of immediate surrounding ground, with the 'Brewery' to the north of the site on the opposite side of Hatton Wall, no longer identified, and the 'Brewery' site formerly present to north west on the opposite side of Portpool Lane now redeveloped with what appear to be residential apartments. A 'Gold Refiners' is now shown to be present approximately 100m to the south of the study site.
1937 map scale - 1:1,056	Site remains developed with undetermined buildings of similar layout to previous map reviewed	No significant changes to use of immediate surrounding land.
1952 - 1953 map scale - 1:1,250	Site remains developed. However changes are shown to the building layout, probably due to bomb damage.	Some changes are shown to the usage of immediate surrounding ground, with the former 'Brewery' to the north of the site on the opposite side of Hatton Wall, now identified as a 'Tobacco Factory'. Ground to the immediate south and south east of the study site is now identified as 'Ruins'. The 'Gold Refiners' are shown to remain present approximately 100m to the south of the study site. A considerable number of 'Ruins' are now shown to be present more widely within the relatively close vicinity of the site probably also as a result of bomb damage.
1954 - 1965 map scale - 1:2,500	Site remains developed with undetermined buildings of similar layout to previous map reviewed	No significant changes to use of immediate surrounding land.
1958 - 1962 map scale - 1:1,250	Site remains developed with undetermined buildings of similar layout to previous map reviewed	No significant changes to use of immediate surrounding land. However, ground to the immediate south and south east of the study site formerly identified as 'Ruins' is now identified as a car park. The 'Gold Refiners' previously recorded as present approximately 100m to the south of the study site is now identified as a 'Works'. The 'Tobacco Factory' is now identified as a 'Factory'.

1961 - 1989 map scale - 1:1,250	Site remains developed with undetermined buildings of similar layout to previous map reviewed	Construction appears to been undertaken on ground to the immediate south and south east of the study site formerly identified as 'Ruins'. The nature of usage of this building is unclear.
1963 - 1974 map scale - 1:1,250	Site remains developed with undetermined buildings of similar layout to previous map reviewed	No significant changes to use of immediate surrounding land.
1965 - 1968 map scale - 1:2,500	Site remains developed with undetermined buildings of similar layout to previous map reviewed	No significant changes to use of immediate surrounding land.
1974 - 1976 map scale - 1:1,25	Site remains developed with undetermined buildings of similar layout to previous map reviewed	No significant changes to use of immediate surrounding land.
1975 - 1983 map scale - 1:1,250	Site remains developed with undetermined buildings of similar layout to previous map reviewed	No significant changes to use of immediate surrounding land.
1991 map scale - 1:1,250	Site remains developed with undetermined buildings of similar layout to previous map reviewed.	No significant changes to use of immediate surrounding land.
1991 - 1995 map scale - 1:1,250	Site remains developed with undetermined buildings of similar layout to previous map reviewed.	No significant changes to use of immediate surrounding land.

Additional Information from Insurance maps (Appendix 5) supplied as part of the Landmark Envirocheck Survey of the site, indicated the following further details which are presented in Table 4.2 below:

Table 4.2 – Details on Previous Site Usage based Upon Historic Buildings Insurance Maps

Map Edition	Key Features on Site	Key Features off Site
Insurance maps dated 1934-1942	The building is indicated to be occupied by M Wiseman & Co. Optical Warehouse	Sawmill to immediate south east, Store and Garage to immediate north east, Chemicals and Apparatus Warehouse to north east. Metal worker to north.
Insurance map dated 1954	The building is indicated to be used as offices	Printers to the immediate north east, Photo Litho Printer to the east south east.
Insurance maps dated 1956-1960	The building is indicated to be used as offices	Ground to the east and south now cleared to Car Park.

4.1 Identified Contaminative Land Uses

A review of the historical maps of the area undertaken as part of the Landmark Envirocheck Search indicated the following historic, potentially contaminative land uses within 500m of the site:

Use	Dates of Mapping		Direction	Distance (m)
	From	To		
Litho Printers	1954	-	ESE	50
Printers	1954	-	NE	30
Railways	1882	Present	NE	199
Road Haulage	1920	1949	E	220

Railways	1882	Present	E	328-370
Railways	1882	1896	SE	415-446
Brewing & Malting	1920	1949	NE	475

5.0 GEOLOGY HYDROGEOLOGY AND HYDROLOGY

5.1 Published Geology

The 1:50,000 scale geological map for the site area, as published online by the British Geological Survey (BGS), indicates the site to be located on Thames Group, London Clay Formation, comprising Clay, Silt and Sand.

Underlying Superficial Deposits are indicated to comprise Hackney Gravel Member – Sand and Gravel deposited approximately 2 million years ago in the Quaternary Period.

The study site is described as having:

- No hazard potential for compressible ground stability;
- Very Low hazard potential from collapsible ground stability;
- No hazard potential from dissolution ground stability;
- Moderate hazard potential for shrinking or swelling clay;
- Very low hazard potential from landslides;
- Very low hazard potential from running sand.

Although the observations made above have a bearing on foundation design measures, a geo-technical assessment of the site is beyond the scope of the current Report.

There is no indication from study of the various maps or from the information provided by the Landmark Envirocheck Survey that natural or mining cavities exist close to the site.

5.2 Hydrogeology

The Groundwater Vulnerability Mapping as supplied in the Landmark Envirocheck Survey for the site area and verified from current internet-based sources indicates that the study site is located above strata classified as a Superficial Deposits Secondary A Aquifer, with underlying Bedrock Deposits shown to be Unproductive. The soils are also indicated to be of High Leaching Potential.

It is considered, given the topographic position of the site, that near-surface groundwater is likely to flow in a generally south south easterly direction towards the course of the former Fleet River and subsequently the River Thames.

5.3 Hydrology

The nearest significant surface water feature is the River Thames, located (at its nearest point) approximately 1.2km to the north of the site.

6.0 ENVIRONMENTAL DATA SEARCH

6.1 Groundwater Abstractions

Information supplied in the Landmark Envirocheck Survey of the site indicates that there are 6 (No.) water abstractions within a 251m to 500m radius of the site and a further 15 (No.) water abstractions between 501m and 1000m (1km) radius around the site. Most of these abstractions appear to be from groundwater sources. The nearest recorded abstractions are identified below:

Type	Nature of Usage	Details
Groundwater Abstraction	Energy and Evaporative Cooling	Licence holder Citigen (London) Ltd. Abstraction from 2 (No.) boreholes located 419m to the south east of the study site.
Groundwater Abstraction	Water used for washing purposes	Abstraction from 1 (No.) borehole located 439m to the north east of the study site. 3 different Licence holders.
Groundwater Abstraction	Water used for industrial/commercial purposes	Abstraction from 1 (No.) borehole located 639m to the south east of the study site. The abstraction is indicated to be from confined Chalk Aquifer.

The nearest groundwater abstraction utilised as a public potable supply is indicated to be located 805m to the north of the study site, at New River Head, and licensed to Thames Water Utilities Ltd.

The site does not lie within a groundwater Source Protection Zone (SPZ). The nearest Zone (Zone II Outer Protection Zone) is located 645m to the north of the study site.

6.2 Waste Management Sites

Information supplied in the Landmark Envirocheck Survey of the site indicates the following:

Type of Facility	Status	Licence Holder	Details
Landfill			There are no operating landfill sites near the study site. However, there are indicated to be closed (historic) landfill sites located at: • Finsbury (Rosoman Street/Skinner Street) approximately 536m to the north of the study site. No details of the licence holder or nature of material deposited are provided • Lincolns Inn Fields, approximately 801m to the south west of the study site. No details of the licence holder or nature of material deposited are provided.
Waste Management Facility:	Active?	Barbican Metal Company (Refiners) Ltd	Located 917m to the north east of the study site.

6.3 Flooding

6.3.1 River and Tidal Flooding

Based upon current EA mapping information, the site is shown to be located in an Area which is classified as Zone 1. A Zone 1 Area is assessed as having a less than 1 in 1,000 annual probability of river or sea flooding (<0.1%).

6.3.2 Surface Water Flooding

Based upon current EA mapping information, the site is shown to be at Very Low Risk of surface water flooding with less than 1 in 1000 year return.

6.3.3 Groundwater Flooding

Information supplied in the Landmark Envirocheck Survey of the site (based upon data supplied by the BGS), indicates that the study site is located in an area where there is potential for groundwater flooding of property situated below ground level.

6.4 River Quality Monitoring Data

Information supplied in the Landmark Envirocheck Survey of the site indicates that there is no local River Quality Classification data available.

6.5 Nitrate Vulnerable Zones (NVZ)

Nitrate Vulnerable Zones were set up under Council Directive 91/676/EEC and have been established in areas where nitrate from agricultural land is causing, or could cause pollution of the water environment. In these Zones, Action Programmes of compulsory measures apply. These measures include a requirement for farmers to limit their applications of livestock manures and, in some circumstances, to observe closed periods for the application of organic manure to agricultural land.

Current EA mapping indicates that the site does not lie within or nearby a NVZ.

6.6 Radon

The Landmark Envirocheck Survey indicates (based upon British Geological Survey, National Geoscience Information Service data), that the study site is located in a Lower Probability Radon Area (less than 1% of homes are estimated to be at or above the Action Level). Therefore, no radon protective measures are likely to be necessary in the construction of new dwellings or extensions on this site.

6.7 Authorisations Consents and Licences

The following information has been supplied in the Landmark Envirocheck Survey of the site:

Type	Holder	Details
Discharge Consent to Controlled Waters	-	The Landmark Envirocheck Survey indicates that there are no discharge consents for the site, although there is one Discharge Consent for a position between 717m to the south east of the site.
LAPPC Authorisation	-	None for the site, although there are four within 0m and 250m of the site.
IPC/IPPC Authorisation	-	The Landmark Envirocheck Survey indicates that there are no such Authorisations for the site, although there are indicated to be 15 (No.) Authorisations within 251m and 500m of the site.

6.8 Environmentally Sensitive Land Usage

Information provided in the Landmark Envirocheck Survey on environmentally sensitive land usage indicated the following:

The site is not:

- Located within a Site of Special Scientific Interest (SSSI);
- Located within a Special Area of Conservation;
- A Ramsar Site.

7.0 RISK ASSESSMENT

7.1 Conceptual Site Model

In accordance with BS 10175, a Conceptual Site Model (CSM) has been developed for the site, based on the potential sources, pathways and receptors identified from the available data and site observations made at the time of writing this report.

7.1.1 Contaminant Sources

The results of the investigations carried out at the site so far have indicated the following:

The actual area of the study site is first recorded in 1590 as being occupied by an Orchard and subsequently an ‘Ornate Garden’, being associated with Hatton Gardens. The first buildings were thought to be constructed on the study site in the 1760s, probably being occupied for by prosperous merchants. By 1851 the site is shown to be developed, although specific layout details are a little unclear. The nature of usage of this building is also undetermined, although it is likely to have initially been used for residential purposes with retail on the ground floor and an increasing usage for commercial purposes and jewellery workshops by the late 19th Century. By 1934 it is recorded as being used (possibly in part) as an ‘Optical Warehouse’ and subsequently, until at least 1960, (in part) as ‘Offices’. It was also indicated anecdotally that the City Gold Plating workshop was formerly used as a ‘Photographer’s Darkroom’. Subsequently and to the present day, a number of jewellery workshops (including the City Gold Plating workshop) have remained established within the building, although sections of the 1st, 2nd, 4th, 5th and 6th Floors are also currently used for residential purposes. At least two other commercial users of the building, including ‘Andreas Von Einsiedel – Interior Photography’ and ‘Fourth Floor Music’ also utilise sections of the building. It is likely therefore that the building has had a relatively long history of varying usage by Jewellery Manufacturer & Repairers. On this basis, it is possible that the building fabric and potentially underlying soils may have been impacted by toxic and

phytotoxic metals such as copper, lead, mercury, nickel and zinc and possibly other more exotic metals generated from metal refining/smelting and jewellery manufacture and repair activities.

Based upon the findings of the walkover survey undertaken on the 6th October 2016, it was noted that there was some evidence of light staining of the floors within a number of the jewellery workshops, although where observed, this did not appear to be significant. However, these workshops were all in use at the time of the survey, so a more detailed inspection was not possible. Externally, within a Light Well area, milky white water was noted to be overflowing from a down pipe and draining into an open man-hole. Ground and the walls around this area also showed evidence of white staining associated with splashing of this water. The nature of the milky white suspension within the water was unclear, although it is understood that metal and jewel polishing compounds are used which comprise powders in a water suspension/paste. It is considered possible that direct leakage through cracks in the ground surface hardstanding or leaking from receiving pipework could, potentially allow any contaminants present in these milky-white waste water to enter into the underlying Superficial Deposits Secondary A Aquifer.

Given the age of the building and previous and current uses for metal refining/smelting and jewellery manufacture and repair, it is considered likely that asbestos containing materials (ACMs) may be utilised within these workshops and within the building fabrication. It is understood that some of the roofing employed on the existing building may also be fabricated from cement-bonded asbestos, although this is subject to further confirmation.

Possible off-site contaminant sources, identified, include; a Litho-Printer located approximately 50m to the east south east of the study site and a Printer, located approximately 30m to the north east of the study site. Ground to the north east has also been previously occupied by a ‘Chemicals and Apparatus Warehouse’.

7.1.2 Contaminant Pathways

Although much of the refurbishment work will be undertaken above ground floor level, it is understood that there is likely to be some disturbance to ground level and basement floors and walls within the building footprint. These works may include the need for piling (underpinning) of two short lengths of existing wall and the excavation of a small area of basement, to lower the floor level slightly in this area.

There is therefore considered to be a potential that groundworkers and construction workers could, potentially, be exposed during these refurbishment works to contaminants potentially present in site soils, and the building fabric, given its previous and recent/current usage. It is therefore recommended that appropriate PPE should be worn by groundworkers and construction workers at all times.

Upon completion of these refurbishment works, it is understood that the ground surface will remain as hardstanding following refurbishment and reoccupancy by commercial, retail and residential tenants. On this basis, there is likely to be a very low risk to future site residents and users of ingestion of any contaminants through contact with local site soils. However, it is considered that dust inhalation could continue to remain an ongoing contaminant exposure route to site residents and users, although risks are likely to be low. These dusts may contain metals such as lead and other toxic metals generated from metal refining/smelting and jewellery manufacture and repair activity.

Where present, and not safely surveyed and removed in advance (where considered most appropriate), release of asbestos fibres could take place during building refurbishment works and remain an ongoing low risk to future site residents and users and the surrounding environment via inhalation pathways.

The site is located in an area classified as a Superficial Deposits Secondary A Aquifer, with underlying Bedrock Deposits shown to be Unproductive. The soils are also indicated to be of High Leaching Potential. Given the presence of the Superficial Deposits Secondary A Aquifer, beneath the site, there is considered to be a potential that any more mobile contaminants released from this site may become entrained in any near-surface groundwater present. However, based upon observations made during the walkover survey, no significant volumes of mobile contaminants were determined as having been stored on the premises.

There are no identified nearby surface water courses or water bodies into which leached or spilt mobile or soluble contaminants may directly discharge from the site following near-surface lateral migration.

There is considered to be a very low risk of contaminant migration via the near surface Superficial Deposits Secondary A Aquifer on to the study site from nearby potential off-site sources, such as the (former) Printer to the immediate north east and the Photo Litho Printer located to the east south east of the study site. However, near-surface groundwater movement is likely to be away from the study site in a south south easterly direction towards the course of the former Fleet River and subsequently the River Thames, probably further mitigating any impacts on the study site from these two possible off-site contaminant sources.

7.1.3 Contaminant Receptors

The principal receptors to any contaminants present on and in the site and in the immediate surrounding areas, are considered to be:

- Future site residents;
- Future site workers;
- Future Site visitors;
- Groundworkers and construction workers;
- Surrounding land users and residents;
- Local groundwater resources, as the site is underlain by a Superficial Deposits Secondary A Aquifer.

7.2 Qualitative Risk Assessment

A qualitative risk assessment of the risk to future site residents, visitors and the surrounding environment from the study site, based upon the above findings, has now been undertaken and is presented below. This concept involves the matching of the identified potential sources of contamination to the targets through the possible migration pathways. These links have to be completed otherwise there is little risk of adverse effects from the site.

This risk assessment is presented in terms of the Source (S), Pathway (P) and Target (T) concept and applying a qualitative value judgement to this appraisal. The assessment assigns a level of risk to each SPT link. The scale of risk applied is presented in the Table 7.2.1 below:

Table 7.2.1: Applied Risk Scale

Risk	Chance of Occurrence
Very High Risk	>67% (from 2 in 3)
High Risk	33% to 67% (from 1 in 3)
Medium Risk	15% to 33% (from 1 in 6)
Low Risk	5% to 15% (from 1 in 20)

Very Low Risk	<5% (less than 1 in 20)

This concept is applied in Table 7.2.2. Although the risk presented in the Table 7.2.1 above and in Table 7.2.2 below is descriptive, it is correlated to a numerical chance of occurrence. Therefore, the range of percentage chance of occurrence is given in order that the reader may assess the datum for the risk level. Although the percentage chance is quoted, this is still a subjective evaluation and is not prepared by probabilistic determination. Therefore, the chance of occurrence is a value judgement and not a numerical calculation.

Table 7.2.2 – Conceptual Model of Pollutant Linkages and Assessment of Associated Risks

Contaminant Source					Exposure Pathway	Receptor(s)	Risk Assessment
Toxic and phytotoxic heavy metals	PAHs	VOCs and/or Ground-borne gases	Petroleum Hydro-carbons	Asbestos			
Yes?	Yes?	No?	No?	Yes	Ingestion or inhalation of contaminated soil, dust or vapours.	Groundworkers and Construction Workers	Low Risk - Based on information currently available although standard PPE should be worn and good hygiene practices adopted.
No	No?	No	No	No	Consumption of tainted mains water supply.		Very Low Risk - Based on information currently available. No evidence of significant volumes of hydrocarbons or other similar mobile chemicals having been previously stored on the site.
Yes	Yes	No	No	No	Dermal contact with contaminated soils and dust.		Low Risk - Based on information currently available, although standard PPE should be worn and good hygiene practices adopted. This assumes that a Demolition and Refurbishment Survey for presence of asbestos has been undertaken and all identified asbestos either removed or left undisturbed by groundworkers and construction workers.
Yes?	Yes?	No?	No?	Yes	Ingestion or inhalation of contaminated soil, dust or vapours.	Future Site Residents users and Visitors	Low Risk - Based on information currently available and proposals presented to break exposure pathway.
No	No?	No?	No?	No	Consumption of tainted mains water supply.		Very Low Risk - Based on information currently available. No evidence of significant volumes of hydrocarbons or other similar mobile chemicals having been previously stored on the site.
Yes?	Yes?	No?	No?	Yes	Dermal contact with contaminated soils and dust.		Low Risk - Based on proposals to retain hardstanding across whole site footprint. However potential for ongoing dermal contact for site residents with existing and future dusts generated within the building from jewellery manufacture and repair activities.

No[2]?	No?	No?	No	No	Surface water runoff and/or migration through ground into local water courses/water bodies or shallow groundwater horizons.	Human consumers of water abstracted from the local water courses/water bodies for potable purposes.	Very Low Risk - Based on information currently available and as no local surface water courses or abstractions for potable purposes identified nearby. No evidence of significant volumes of hydrocarbons or other similar mobile chemicals having been stored on the site.
No[2]?	No?	No?	No	No	Surface water runoff and/or migration through ground into the local water courses or shallow groundwater horizons.	Livestock consuming water abstracted from the local water courses/water bodies.	Very Low Risk - Based on information currently available.
No[2]?	No?	No?	No	No	Surface water runoff and/or migration through ground into the local water courses or shallow groundwater horizons.	Aquatic life in the local water courses and the subsequent food-chain through consideration of bioaccumulation factors.	Very Low Risk - Based on information currently available.
No[2]?	No?	No?	No	No	Surface water runoff and/or migration through ground into the local water courses or shallow groundwater horizons. Also general uptake by plants growing on the site surface.	Local flora and fauna	Very Low Risk - Based on information currently available.
No[2]?	No?	No?	No	No	Surface water runoff and/or migration through ground into the local water courses or groundwater horizons.	The quality of groundwater resources more generally	Very Low Risk - Based on information currently available. No evidence of significant volumes of hydrocarbons or other similar mobile chemicals having been previously stored on the site.
No	No?	No?	No	No	Subsurface ground-borne gas and VOC vapour migration.	The future built environment on the site, site residents and surrounding areas	Very Low Risk – Based on current information available.

Key:

Yes - Pollutant linkage likely
No - Pollutant linkage unlikely
? - Pollutant linkage possible
1 - Depends on pH
2 - Depends on leaching characteristics

8.0 CONCLUSIONS

8.1 Desk Study Findings

Based on the information reviewed, the actual area of the study site is recorded in 1590 as being occupied by an Orchard and subsequently an 'Ornate Garden', being associated with Hatton Gardens. The first buildings were thought to be constructed on the study site in the 1760s, probably being occupied by prosperous merchants. Towards the latter part of the 19th Century, it appears that the buildings on the study site are likely to have become occupied in part by workshops associated with jewellery manufacture. At this stage it also appears that land to the rear of no 72-80 Leather Lane had become occupied by a Warehouse, with the study site comprising a wide plot that linked into a Saw Mill located on its southern/south eastern side. Subsequent usage of buildings on 72-80 Leather Lane are not clear, although it is considered likely that ground floor levels were occupied by retail premises, with upper levels either being used for residential, workshop and commercial activities. By 1934, buildings are recorded as being used (possibly in part), as an 'Optical Warehouse' and subsequently, until at least 1960, as 'Offices'. It was also indicated anecdotally that the 'City Gold Plating' workshop was formerly used as a 'Photographer's Darkroom'. Subsequently, and to the present day, a number of jewellery workshops (including the 'City Gold Plating workshop') became established within the building, although sections of the 1st, 2nd, 4th, 5th and 6th Floors are also currently used for residential purposes. At least two other commercial users of the building, including 'Andreas Von Einsiedel – Interior Photography' and 'Fourth Floor Music' also utilise sections of the building. It is likely, therefore, that the building has had a relatively long history of varying usage by Jewellery Manufacturer & Repairers. On this basis, it is possible that the building fabric and potentially underlying soils may have been impacted by toxic and phytotoxic metals such as copper, lead, mercury, nickel and zinc, and possibly other more exotic metals generated from metal refining/smelting and jewellery manufacture and repair activities.

No other potentially significant near-by contaminant sources were identified on or off site, although a Printer is known to have been located to the immediate north east and a Photo Litho Printer located to the east south east of the study site. However, near-surface groundwater movement is likely to be away from the study site in a south south easterly direction towards the course of the former Fleet River and subsequently the River Thames, probably mitigating any impacts on the study site from these two possible off-site contaminant sources.

Large areas of the surrounding area appear to have suffered bomb-damage during the Second World War, although it is not known whether buildings present on 72-80 Leather Lane were impacted and a UXO (unexploded ordnance) survey of this site was not undertaken as part of the current study.

The site is located above strata classified as a Superficial Deposits Secondary A Aquifer, with underlying Bedrock Deposits shown to be Unproductive. The soils are also indicated to be of High Leaching Potential.

It is considered, given the topographic position of the site, that near-surface groundwater is likely to flow in a generally south south easterly direction towards the course of the former Fleet River and subsequently the River Thames.

The site does not lie within a groundwater Source Protection Zone (SPZ), and no groundwater abstractions are known to occur at the site or within the immediate vicinity.

Based upon current EA Flood Mapping mapping information, the site is shown to be located in an area which is classified as Zone 1. A Zone 1 Area is assessed as having a less than 1 in 1,000 annual probability (<0.1%) of a river or sea flooding event. However, the site is indicated to be

located in an area where there is potential for groundwater flooding of property situated below ground level.

The property is indicated to be located in a Lower Probability Radon area (less than 1% of homes are estimated to be at or above the Action Level). Therefore, no radon protective measures are likely to be necessary in the construction of new dwellings or extensions on this site.

8.2 Walkover Survey Findings

It was noted from the walkover survey carried out in existing jewellery manufacture and repair workshops located within the building, that the floors within these workshops had become lightly stained by liquids and compounds used, which appeared to include a variety of metals, acids, and abrasive powders. It is considered likely that the floors and walls to these workshops will have experienced some slight contamination by these compounds and liquids.

Given the age and previous and current uses of the building, it is considered that there is a potential for the presence of asbestos and asbestos containing materials (ACMs) within the building fabric, particularly in areas used currently and previously as workshops for jewellery manufacture and repair. It is understood that some of the roofing employed on the existing building may also be fabricated from cement-bonded asbestos, although this is subject to further confirmation.

Externally, within the existing Light Well area, milky white water was noted to be overflowing from a down pipe and draining into a partially open man-hole. Ground and the walls around this area also showed evidence of white staining associated with splashing of this water. The nature or source of the milky white suspension within the water was unclear, although it is understood that metal and jewel polishing compounds are used which comprise powders in a water suspension/paste. It is considered possible that direct leakage through cracks in the ground surface hardstanding or leaking from receiving pipework could, potentially allow any contaminants present in these milky-white waste water to enter into the underlying Superficial Deposits Secondary A Aquifer.

9.0 RECOMMENDATIONS

If not undertaken already, it is recommended that prior to refurbishment works and any associated demolition, and in order to confirm or otherwise the absence of asbestos or asbestos containing materials (ACMs) within the building fabric, a ‘Refurbishment and Demolition Survey’ be carried out of the existing buildings and structures present on the site. This type of survey is intended for all work that is liable to disturb the fabric of a building, with the intention of locating all the asbestos materials within buildings/structures (or areas surveyed), as far as is reasonably practicable. It is therefore a ‘fully intrusive’ survey, and should involve aggressive inspection techniques to gain access to all specified areas including penetration to the fabric of the buildings/structures. Should asbestos or asbestos containing materials (ACMs) be encountered, then a Licensed Asbestos Removal Contractor should be employed to undertake removal activities (where considered the most appropriate course of action), prior to any demolition and refurbishment works commencing.

Although, as indicated above, no information is currently available which suggests that site soils are contaminated, it is however recommended that care should be taken by groundworkers and construction staff during refurbishment works to adopt good standards of personal hygiene and take into consideration recommendations presented in the HSE Guidance Document HS(G)66 ‘Protection of Workers and the General Public during the Development of Contaminated Land’. Groundworkers and Construction workers should wear adequate and appropriate PPE whilst

undertaking alteration/refurbishment works on this site. This will be particularly necessary during the works to lower the floor area within a section of the basement, and throughout the piling (underpinning) works to the two short sections of wall.

Dusts generated by jewellery manufacture and repair activities within the workshops may contain slightly elevated concentrations of metals. These dusts may potentially enter into the proposed residential apartments within the building. It is recommended that efforts are made to mitigate as far as is possible the future dispersal of dusts beyond the confines of these workshops.

It is recommended that a drains survey be undertaken to assess the integrity of the existing drains, into which discharge of fluids/washing waters likely to be associated with jewellery manufacture and repair workshops on the site was taking place.

The Landmark Envirocheck survey indicates that there are no Discharge Consents for the site. It should therefore be determined whether a Trade Effluent Discharge Consent should be obtained from Thames Water Utilities Limited for the fluids/washing waters which appeared, based upon observations made during the walkover survey, to be discharged to (foul) sewer.

Although probably assessed already, it is recommended that due consideration be given to any impact on the structural integrity of the current building present on 72-80 Leather Lane from blast damage associated with WW2 bombing, which is known to have impacted/destroyed a number of nearby surrounding buildings.

The findings of this assessment are based upon Cameron Environmental's current understanding of the proposed site redevelopment works. Should circumstances change, then the Risk Assessment should be revisited.

For a complete version of this Report including all Appendices, (total file size approximately 162MB) please contact Cameron Environmental, and a Dropbox link will be provided.

APPENDIX 1

Site Location and Layout Drawings

APPENDIX 2

Site Photographs

APPENDIX 3

Historical Ordnance Survey Maps and Plans

APPENDIX 4

Squire Heritage Consulting Summary Document

APPENDIX 5

Historic Buildings Insurance Maps

APPENDIX 6

Landmark Envirocheck Survey Documentation and Data