

Appendix 7.1

Phase 1 Preliminary Risk Assessment



**READING METROPOLITAN
CAVERSHAM ROAD, READING**

PHASE 1 PRELIMINARY RISK ASSESSMENT

FOR

HERMES INVESTMENT MANAGEMENT



December 2018

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RPS Consulting Services Ltd
35 New Bridge Street
London
EC4V 6BW

Tel: 020 7280 3240
Email: rpslon@rpsgroup.com

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Project Reference:	HLEI67906	
	Name:	Signature:
Report Author:	Liz Holland	
Technical Reviewer:	Jim Lightbown	
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EXECUTIVE SUMMARY

RPS Consulting Services Ltd (RPS) was commissioned by Hermes Investment Management to undertake a Phase 1 Preliminary Risk Assessment for a site on Caversham Road in Reading. The report has been commissioned prior to the proposed redevelopment of the site to comprise the Reading Metropolitan development.

On Site and Surrounding Land Use

At the time of the walkover, the site comprised a former Royal Mail sorting office, vacant office building with service yards and areas of car parking. A disused generator with some evidence of hydrocarbon staining was located in the northwest of the site. In addition, an electricity substation was located in the northwest of the site. Another electricity substation is located adjacent to the north of the site.

History of Site and Surrounding Land Use

Historical mapping indicates that from at least 1879 the site comprised part of the Great Western Railway Works, which included a railway foundry, forge and saw pit. By c.1899, railway sidings associated with a coal depot were indicated to be present on site. By c.1956, the site had been redeveloped to comprise a large works building, subsequently labelled as a railway works. By 1988, the site had been redeveloped to comprise the Royal Mail sorting office. A former vehicle maintenance workshop, vehicle wash and refuelling area (all associated with the Royal Mail sorting office) were located adjacent to the east of the current site boundary. At the time of the RPS visit in November 2018, these areas were no longer present and a new entrance area to Reading train station was present.

Environment Agency data indicates that there is one pollutant incident recorded in the northwest of the site. Reading Borough Council advised of two pollution incidents having occurred at the site, as part of a Contaminated Land Preliminary Phase 1 Report previously undertaken by Arup (ref: 211770 Draft 3, dated March 2010).

Historical maps indicate that the coal depot extended off-site to the north from at least 1899 to c.1956. Railway sidings were located adjacent to the north, south and east of the site from 1899 to c.1989.

Previous Site Investigations

Two site investigations have previously been undertaken at the site. A geo-archaeological investigation of limited scope was carried out in 2011. Lead was recorded at concentrations in excess of the residential assessment criteria (AC) in two of the samples of Made Ground, but below the commercial AC as part of this investigation. The proposed building cover, hardstanding and clean cover in any areas of soft landscaping would mitigate any potential risks to future on site human health receptors via the pathways of dermal contact and ingestion.

A number of contaminants of concern were recorded at concentrations in excess of their AC, protective of controlled waters receptors, within the two groundwater samples collected from monitoring wells located in the centre of the site.

A 2012 site investigation was undertaken by Ian Farmer Associates with an interpretation of the findings subsequently undertaken by Arup. No exceedances for contaminants of concern in soil samples were recorded against commercial GAC. Slight exceedances of concentrations of lead were recorded against a residential use. Asbestos was identified in three of the 27 samples of Made Ground. Groundwater results indicated that the quality of groundwater beneath the site was good and there was no evidence of any significant contamination. Very limited ground gas monitoring was undertaken, with that completed indicating that ground gas protection measures would not be required for the current development area.

Environmental Setting

The majority of the site is indicated to be underlain by an Unproductive Stratum relating to the Langley Silt Member (Alluvium). The underlying Kempton Park Gravel Member (River Terrace Deposits) is classified as a Secondary A Aquifer and the White Chalk Subgroup as a Principal Aquifer.

The site is not indicated to be located in a groundwater Source Protection Zone (SPZ). Two potable groundwater abstraction points are indicated to be located within 1km of the site, the nearest of which is located approximately 375m to the northwest.

Recommendations

Based on the intrusive investigations undertaken across the site to date, it is not considered that there would be significant risks to identified sensitive receptors following the redevelopment of the site. Whilst the coverage of exploratory holes across the majority of the site as part of the previous site investigations would be considered generally acceptable for the purpose of due diligence (for which they were originally undertaken six to eight years ago), updated assessment is considered necessary with particular attention to data gaps identified from the previous reports. It is therefore recommended that additional Phase 2 Environmental Site Investigation be carried out to provide an assessment of the current status of soil and groundwater beneath the site, in addition to the current ground gas regime.

It would be prudent to combine any site investigation undertaken for environmental purposes with geotechnical testing, in order to facilitate preliminary foundation, basement and pavement design.

1 INTRODUCTION

1.1 Preamble

RPS Consulting Services Ltd (RPS) was commissioned by *Hermes Investment Management* to undertake a Phase 1 Preliminary Risk Assessment for a site on Caversham Road in Reading. The report has been commissioned prior to the proposed construction of the Reading Metropolitan development on the site.

This Phase 1 Preliminary Risk Assessment will be suitable for submission as part of the planning application for the proposed redevelopment of the site. In addition, information provided in the report will be used to inform the baseline conditions section of the Geology, Hydrogeology and Ground Conditions Environmental Statement (ES) Chapter for the Environmental Impact Assessment (EIA).

The site covers an area of approximately 1.94ha and comprises a former Royal Mail sorting centre, a three storey office building and areas of car parking. The site has most recently been used by Network Rail as site offices during the works to Reading train station. The site is currently vacant. A site location plan is presented as Figure 1.

RPS has had prior involvement with the site, having provided consultancy advice to Hermes at the time of their purchase of the site. As such, RPS is aware of a number of previous environmental assessments having been carried out at the site, which are discussed in Section 1.4 below.

1.2 Objectives

The principal objectives of this assessment were as follows:

- To assess potential sources of contamination at the site, associated with historical and current land uses both on site and in the surrounding area;
- To review the environmental setting to assess the sensitivity of the surrounding area to contamination/pollution;
- Produce an outline Conceptual Site Model (CSM) detailing how any contamination may impact the identified receptors via pollutant linkages; and
- Recommendations for further investigation of potential pollutant linkages, where considered necessary.

1.3 Legislation and Guidance

This report has been produced in general accordance with:

- Contaminated Land (England) Regulations 2006 (as amended);
- DEFRA Environmental Protection Act 1990: Part 2A - *Contaminated Land Statutory Guidance (2012)*;
- DEFRA and Environment Agency (2004) Contaminated Land Report 11 (CLR 11): *Model Procedures for the Management of Land Contamination*;
- National Planning Policy Framework (2018);
- CIRIA Document C665: *Assessing Risks Posed by Hazardous Ground Gases to Buildings*;
- British Standard requirements for the '*Investigation of potentially contaminated sites - Code of practice*' (ref. BS10175:2011+A1:2013);
- British Standard requirements for the '*Code of practice for ground investigations*' (ref. BS5930:2015); and
- British Standard requirements for the '*Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings*' (ref BS8485:2015).

Where appropriate, consideration has also been given to the following:

- The potential for environmental liabilities to occur under other associated regimes, for example the *Water Resources Act (1991)* and the *Environmental Damage (Prevention and Remediation) (England) Regulations (2015)*; and
- Key constraints on site redevelopment.

Details of the limitations of this type of assessment are described in Appendix A.

1.4 Previous Reports

RPS has been provided with the reports detailed below for review. RPS cannot vouch for the accuracy or validity of the information provided within third party reports and the following opinion is based solely upon the reports. Legal reliance should be sought from the original authors of these reports where their content is considered material to the characterisation of the site. *RPS comments are provided in non-bold italics*. It should be noted that geotechnical issues fall outside the remit of this review.

***Contaminated Land Preliminary Phase 1 Report, Royal Mail Site, Caversham Road, Reading
(for Royal Mail Group), by Arup, ref: 211770 Draft 3, dated March 2010***

- *It should be noted that RPS was commissioned by Hermes to undertake a review of this report in relation with the potential acquisition of the site for investment purposes. RPS provided a number of comments in a letter report dated 2nd July 2012 (ref: HLEC22145/001R). Where relevant, these comments are incorporated into the below review.*
- The report was undertaken to support a Ground Conditions and Contamination ES Chapter for an EIA to support an outline planning application in 2011 (ref: 11/00276/OUT) for the proposed redevelopment of the site to comprise a mixed use scheme. *The area assessed as part of the current application is smaller than that considered under the previous application, as an additional area to the east was previously included within the site boundary.*
- The main objective of the assessment was to identify any potential sources of contamination at the site which may require further investigation and assess potential receptors in the vicinity of the site.
- At the time of the walkover, Network Rail occupied an office building and used the site for car parking. Underground fuel storage, vehicle refuelling, a vehicle wash, a vehicle repair workshop and an electrical substation were also present associated with the former Royal Mail sorting office. Various tanks and containers of fuel/oil were noted at the site and significant black staining was observed on the floors and walls in the vehicle repair workshop and at the refuelling area. *It should be noted that the area of the vehicle repair workshop, vehicle wash and the refuelling area (including underground fuel storage) are not included within the red line boundary for the current planning application. At the time of the 2018 RPS visit, this area had been redeveloped to comprise an external seating area, taxi rank, bicycle storage and bus stops associated with Reading train station.*
- Historical mapping indicated that the site was occupied by the 'Great Western Railway Works' (including buildings, sidings and an electrical substation) from at least 1879 to c.1984. By c.1984, the site had been redeveloped to comprise a mail sorting office building in the north. By c.1993, the site resembled its layout at the time of reporting, comprising three main buildings (the sorting office, an office and the former vehicle maintenance and repair shop) and several smaller buildings.
- Potentially contaminative off-site land uses included a goods station, railway tracks, malthouses, timber yard, coal depot (partially extending onto the site), an iron works (then garage, electricity and engineering works) and warehouses.
- Reading Borough Council (RBC) advised of two pollution incidents at the site occurring in August 1991 (chemicals to Vastern Ditch watercourse) and in September 2011 (fly tipping of green waste). The Council advised that they had identified the site as potentially contaminated, requiring 'further investigation' under Part 2A of the Environmental Protection Act 1990.

- Planning records available at RBC offices suggested that permission for construction of the Royal Mail post office was granted in July 1984 and permission for a container repair workshop in January 1994.
- The Petroleum Officer at RBC was contacted regarding information about the former fuel filling area on the site, and any other above or below ground fuel tanks. The Petroleum Officer confirmed that the site was not licensed by the Council for the storage of petroleum spirit and therefore no records were held regarding the site.
- A preliminary Conceptual Site Model (CSM) was produced and identified a number of plausible pollutant linkages which would require further investigation. These included a number relating to the area of the current site, given its historical use as railway line and part of a coal depot.

Ground Conditions and Contamination ES Chapter (Chapter 12), by Arup, dated February 2011

- The Ground Conditions and Contamination ES Chapter was prepared to support the previous planning application for the proposed redevelopment of the site, under ref: 11/00276/OUT.
- *It should be noted that this review is not specifically concerned with the findings of the ES Chapter, but rather the information included in the baseline conditions section which may be relevant to the current application.*
- One of the information sources listed in the chapter was a geo-archaeological ground investigation and groundwater monitoring visit, undertaken in December 2010 and January 2011. *RPS notes that no standalone report relating to this investigation was provided, however relevant findings were included in the ES Chapter and the Arup Interpretative Report on Phase 2 Geo-Environmental Ground Investigation (as discussed below).*
- The investigation comprised the drilling of two boreholes to depths of approximately 3.50m below ground level (bgl), located on the eastern side of the former Royal Mail sorting office.
- Encountered ground conditions comprised Made Ground, underlain by Alluvium (in one of the boreholes) and then River Terrace Deposits (the base of this stratum was not proven).
- *It is noted that Arup used the Alluvium terminology and, although British Geological Survey (BGS) mapping indicates that the Langley Silt Member is present beneath the site, it is considered that the two names can be used interchangeably in the context of this report. This is also the case for the River Terrace Deposits terminology as BGS mapping indicates that the Kempton Park Gravel Member is present beneath the site. In the subsequent text, RPS has used the Langley Silt Member and Kempton Park Gravel Member terminology.*
- Monitoring wells were installed in both boreholes, screened across the Kempton Park Gravel Member.
- Three samples of Made Ground and one sample of Langley Silt Member were submitted for chemical laboratory analysis for metals; speciated total petroleum hydrocarbons (TPH CWG) including benzene, toluene, ethylbenzene and xylenes (BTEX); speciated polycyclic aromatic hydrocarbons (PAHs); and asbestos. Concentrations of ionisable volatile organic compounds

(iVOCs) in the soil samples were analysed using a Photo-Ionisation Detector (PID). All readings were below the instrument limit of detection. No visual or olfactory evidence of contamination was observed during the investigation.

- Groundwater levels were monitored on one occasion, recorded at depths of approximately 1.94m and 1.95m bgl.
- Groundwater samples were collected from both monitoring wells and analysed for a similar range of determinands as for the soil samples.
- Soil results were compared to Soil Guideline Values (SGVs) and generic assessment criteria (GAC) developed by Arup for a residential end use (without homegrown produce). This was considered to be a conservative assessment, given that no private gardens were proposed and the presence of commercial, retail and public open space areas which are less sensitive than residential land uses. Lead was recorded at concentrations in excess of the residential assessment criteria (AC) for two of the samples of Made Ground, but below the commercial AC.
- Groundwater results were compared to UK Drinking Water Standards (DWS) and where not available, Environmental Quality Standards (EQS) and Dutch Intervention Values (DIV). *RPS notes that the DIV are no longer used, as the UK has developed its own standards.* Ammoniacal nitrogen, several speciated PAHs and TPH compounds were recorded at concentrations in excess of their AC.
- It was noted that further ground investigation would be required across the site.
- It was assumed within the ES Chapter that any significant soil and groundwater contamination would be localised (and not widespread), principally impacting the Made Ground. *RPS notes that no explanation for this assumption was provided within the report.*

Final Factual Ground Investigation Report, Royal Mail Site, Caversham Road, Reading (for Royal Mail Group, by Ian Farmer Associates, ref: 20958, dated October 2012

- An investigation was undertaken to assess potential contamination of the underlying soil and groundwater, and to establish groundwater levels.
- The site investigation comprised three cable percussion boreholes advanced to a maximum depth of approximately 7.50m bgl and nine window sample boreholes advanced to a maximum depth of approximately 4.00m bgl.
- Groundwater monitoring wells were installed in all three cable percussion boreholes (all screened across the Kempton Park Gravel Member) and seven of the window sample boreholes, screened across the Made Ground and Langley Silt Member.
- Forty-five soil samples were collected and analysed for a range of determinands including asbestos, metals, TPH CWG (including BTEX), speciated PAH, polychlorinated biphenyls (PCBs), volatile organic compounds (VOCs) and semi-volatile organic compounds (SVOCs).
- Eight soil samples were also subject to waste acceptance criteria (WAC) testing.

- Six groundwater samples were collected and analysed for a similar range of determinands as the soil samples.
- One round of ground gas and groundwater level monitoring was undertaken.

Interpretative Report on Phase 2 Geo-Environmental Ground Investigation, Former Royal Mail Sorting Office Site, Caversham Road, Reading (for Royal Mail Group), by Arup, ref: REP/10-2012/001/RO, dated 14th November 2012

- The report was undertaken to better inform the underlying ground conditions and presence of any significant contamination beneath the site as part of the sale/purchase negotiations. The scope of investigation was agreed between Arup and RPS. *RPS subsequently provided comments on the Draft 3 version of this report, comments were provided in a letter report (ref: HLEI22438-01L, dated 1st November 2012).* The report reviewed the findings of the geo-archaeological investigation and assessed the findings of the site investigation undertaken by Ian Farmer Associates.
- It was noted that the purpose of the investigation was not to satisfy planning conditions and therefore consultation was not carried out with RBC or the Environment Agency (EA).
- Further information was provided in the report regarding the fuel island (to the east of the current development boundary). It was reported that in December 2009, two fuel tanks beneath the fuel island were decommissioned, the tanks remained in the ground but were foam filled.
- Encountered ground conditions generally comprised Made Ground underlain by the Langley Silt Member, Kempton Park Gravel Member and then the White Chalk Subgroup.
- Groundwater was encountered at the top of the Kempton Park Gravel Member and groundwater flow direction was considered to be from west to east.
- As part of the ground gas monitoring, methane was not recorded at concentrations above the instrument limit of detection. Carbon dioxide was recorded at a maximum concentration of 7.5% v/v in a monitoring well located in the far east of the site. *It is noted that this monitoring well is not located within the current red line boundary.* Steady state flow rates were generally recorded below the instrument limit of detection (a negative flow rate was recorded in one well). *No ground gas assessment was undertaken, however RPS notes that, based on the very limited monitoring carried out, ground gas protection measures would not be required for the current development area. As only one round of ground gas monitoring was undertaken as part of the investigation, additional ground gas monitoring should be carried out at the site.*
- Visual and olfactory evidence of contamination was observed within the Made Ground and Langley Silt Member at borehole CP12-01. This borehole was located in the vicinity of the former refuelling area. The soils were described as having a hydrocarbon odour and 'oil liquid on the material but not running liquid'. *It should be noted that borehole CP12-01 is not located within the current red line boundary.* No visual or olfactory evidence of contamination was encountered during the groundwater sampling.

- Soil analytical results were compared to GAC using the standard UK CLEA model for both commercial and residential (without plant uptake) end use scenarios. No exceedances against commercial criteria were reported. Slight exceedances of concentrations of lead in four samples of Made Ground were recorded against the residential use GAC (*three of the locations are within the current boundary and one outside the boundary to the east*) and aliphatic hydrocarbons in the sample of Made Ground collected from borehole CP12-01 (*this is not located within the current development area*).
- Asbestos was identified in three of the 27 samples of Made Ground screened. All three samples were reported to comprise chrysotile asbestos fibres. Subsequent quantification testing indicated that all samples had less than 0.001% by mass of asbestos.
- Groundwater analytical results were compared to EQS or UK DWS. The results indicated that the quality of groundwater beneath the site was good and there was no evidence of any significant contamination. The only exceedances related to ammoniacal nitrogen, which was recorded at elevated concentrations within two of the groundwater samples.
- It was considered that the requirement for future remediation (relating to the proposed redevelopment of the site) would comprise the localised over-excavation of any contamination 'hotspots' encountered during the construction phase. It was recommended that further investigation be undertaken to delineate the lateral extent of the hotspot in the area of borehole CP12-01. *It should be noted that this borehole is not located within the current red line boundary and at the time of the 2018 RPS visit, this area had been redeveloped to comprise an entrance area to Reading train station.*
- It was reported that the redevelopment of the site would involve the mass excavation of Made Ground and Langley Silt Member across most of the central and western sides of the development to facilitate construction of a basement, as well as excavations for services and pavements. The excavation of material for the basement would effectively 'remediate' the area of the basement footprint and no contamination of the ground beneath the basement dig level was anticipated. *The basement level proposed as part of the current development is mainly limited to the eastern portion of the site and a small area in the southwest corner, so the proposed excavation of material is likely to be more limited than that considered within the Arup report.*

2 SITE RECONNAISSANCE AND DESK STUDY

2.1 Site Reconnaissance

This section of the report is based upon observations made during a site visit carried out on 13th November 2018. A site boundary plan is provided as Figure 2. Selected photos are shown in Appendix B.



General view of the site. For further photos see Appendix B.

2.1.1 The Site

Table 1 – Summary of on-site activities

Section	Description
<i>Background:</i>	The site is located to the north of Reading train station at National Grid Coordinates 471358,173990. It is irregular in shape and occupies an area of approximately 1.94ha. The site comprises a former Royal Mail sorting office, three storey office building and associated car parking areas/service yards. The site was disused at the time of the site walkover.
<i>Site Layout:</i>	The site comprised a rectangular two storey equivalent warehouse (the former sorting office) located in the centre to northwest of the site. A smaller square former office building was located in the southwest of the site. External areas (comprising former service yards and car parking areas) were located in the west, south and east of the site. The site was generally flat with slight slopes in external areas towards surface water drains. The site was accessed from Caversham Road to the west (at the time of the site walkover, this access point was boarded up) and Trooper Potts Way to the east.

<i>Activity Operations:</i>	At the time of the walkover, the site was vacant with only security staff present. The site representative reported that the site was formerly utilised by Network Rail as offices and construction site offices prior to which it was utilised by the Royal Mail as a sorting office. The former sorting office comprised a central two storey equivalent warehouse area (see Photo 1, Appendix B) with an enclosed walkway. Ground and first floor offices, storage rooms and welfare facilities were located in the south, southwest and northwest of the warehouse. The south of the warehouse comprised a number of doors leading to a raised concrete platform (see Photo 2, Appendix B). The raised concrete platform had ramps on either end. Two roller shutter doors were located to the north/west of the platform providing vehicular access to the warehouse. The former office building was arranged over ground and two upper floors around a centre courtyard area. The building comprised former open plan and enclosed offices and associated welfare facilities. The site representative reported that a canteen may also have previously been present in the building. A passenger lift was also located within the building. A building, housing plant equipment, was noted adjacent to the west of the office building. A first floor walkway connected the office and sorting office buildings (see Photo 3, Appendix B). A diesel backup generator and an electricity substation were noted adjacent to the northwest of the sorting office. What appeared to be air handling equipment was noted to the southeast of the sorting office within an overgrown area separated by metal fencing from the car parking area (see Photo 4, Appendix B). Markings on the external areas indicated that the west and central external areas of the site were used for vehicle parking.
<i>Building Structure(s):</i>	The sorting office and office building appeared to be of steel framed construction with brick /concrete walls with metal cladding above.
<i>Surface Cover:</i>	The external areas were laid to brick paving. Some undulations, holes, water pooling and vegetation growth were noted within the brick paving. However, no significant staining was noted. The western and eastern edges of the sorting office area comprised a raised pavement around the building. The southern boundary of the site comprised an area of gravel (potentially the result of the development of a tarmacadam walkway adjacent to the south of the site) (see Photo 5, Appendix B). A small mound with some vegetation and evidence of rubbish was noted on the southeastern boundary of the site. Soft landscaping was located on the western edge of the site comprising grass and some trees.
<i>Drainage:</i>	Drainage plans were not made available to RPS for review as part of this assessment. Foul water on site is considered likely to be limited to sewage and domestic waste water, and given the site's location is likely to drain into the municipal sewerage water drainage system, as is any surface water drainage. Surface water drain was noted to run parallel to the raised concrete platform of the sorting office. Surface water drains were also noted within external areas. Evidence of three potential oil/water interceptors were noted on site. Two sets of three adjacent manhole covers were noted in the external area in the centre of the site (to the south of the sorting office), a second set of three adjacent manhole covers was noted in the west of the site, to the north of the office building. A likely ventilation pipe was also noted adjacent to this potential interceptor (see Photo 6, Appendix B).
<i>Bulk Storage / Tanks:</i>	A disused backup generator was observed in the northwest of the site. The generator was located within a metal unit on a concrete base. An approximately 200 litre capacity diesel storage tank was present within the generator unit. No other bulk fuel storage tanks were noted during the site walkover however it should be noted that areas to the east and north of the generator could not be accessed. Significant staining was observed internally to the generator unit (see Photo 7, Appendix B) with minor staining noted on the concrete base externally to the unit (see Photo 8, Appendix B).
<i>Waste:</i>	A skip was present on site, this was reported to be for the disposal of building works waste as the security team guard the site from unauthorised access. No other waste storage was noted on site.

Section	Description
<i>Air Emissions:</i>	Air conditioning units (disused) were noted on the walls of the sorting office building. The units were noted to comprise the refrigerant R407C which is not an ozone-depleting substance. No other sources of air emission were observed during the site walkover.
<i>Electricity Substations /Transformers:</i>	An electricity substation was present in the northwest of the site. Signage on the substation indicated it was the responsibility of <i>SSE Power</i> .
<i>Visual Contamination:</i>	RPS did not observe any significant visual or olfactory evidence of contamination on site during the site walkover.
<i>Statutory Nuisance:</i>	RPS is not aware of any complaints relating to statutory nuisance at the site.
<i>Other Issues:</i>	No <i>Japanese Knotweed</i> or <i>Giant Hogweed</i> (invasive plant species) were readily identified on or adjacent to the site at the time of the survey. <i>(It should be noted that the identification can be limited by the seasons and in areas of dense vegetation growth).</i> The majority of the monitoring wells installed as part of the 2012 investigation were observed to still be present on site.

2.1.2 The Surrounding Area

The site is located in an area of predominantly commercial land use. At the time of the site inspection, neighbouring land consisted of the following:

Table 2 – Neighbouring Land Uses

Direction	Description
<i>North:</i>	Large retail units and restaurants, including The Range (miscellaneous home goods), Majestic Wine (wine retailer), Mothercare (child car retailer) and Aldi (supermarket).
<i>East:</i>	Northern entrance to Reading train station with external seating area, taxi rank, bicycle storage and bus stops*. With a multi-storey car park associated within Reading train station beyond.
<i>South:</i>	Reading train station.
<i>West:</i>	Caversham Road with retail units beyond.

* This area previously comprised the vehicle repair workshop, vehicle wash and the refuelling area (including underground fuel storage) associated with the Royal Mail sorting office.

2.2 Proposed Development

The site is proposed to be redeveloped to comprise a mixed use residential-led scheme. Uses will include a community centre, health centre, offices, commercial units, areas of soft landscaping and public open space. Parts of the site will be underlain by a basement, in the east of the site this will comprise a car park, energy centre, plant rooms, refuse areas and tanks. A small area in the southwest of the site will also be underlain by a basement, uses in this area will comprise refuse, plant, cycle parking and a tank. The basement tanks will comprise sustainable drainage system (SuDS) features, some of which might potentially be used for rainwater harvesting.

The proposed basement plan is provided as Figure 3a and the proposed ground floor plan is included as Figure 3b.

2.3 Site History

2.3.1 Historical Map Review

The following review is based on past editions of readily available Ordnance Survey (OS) maps. These include scales of 1:1,250, 1:2,500 and 1:10,000 dated 1879 to 2014. Extracts from selected historical maps are given as Figure 4 to Figure 7.

Table 3 – Historical Site Uses

On-site Land Use and Features	Dates
The majority of the site comprised part of the Great Western Railway Works including railway sidings. A railway foundry (iron) and a forge were present in the west of the site and a saw pit in the east.	1879 to c.1899
The layout of the buildings associated with the railway works had changed and additional buildings had been constructed in the north. A number of additional railway sidings associated with a coal depot (which also extended off-site to the north) were also present in the north.	1899 to c.1956
The site had been redeveloped and a large works building was present across the majority of the site. A number of smaller buildings of unspecified use were present along the western and southern boundaries of the site. Railway sidings were present in the far north, east and south of the site.	1956 to c.1969
The site remained in its existing layout but was labelled as comprising railway works with an electricity substation in the northwest.	1969 to c.1979
The site continued in the same layout but was labelled as a works.	1979 to c.1988
The site had been redeveloped to comprise a sorting office and two further buildings of unspecified use, one located in the west (currently in use as an office building) and the other along the southern boundary.	1988 to c.2014
The building along the southern was no longer indicated to be present and the site resembled its current day layout.	2014 to Present

Table 4 – Historical Neighbouring Site Uses

Surrounding Land Uses (100m radius)	Orientation	Distance	Dates	
			From	To
Coal depot	North	Adjacent	1899	c.1956
Railway sidings	North, South and East	Adjacent	1899	c.1989
Electricity substation	North	Adjacent	1993	Present
Railway line	South	5m	1877	Present
Malthouses	West	20m	1877	c.1899
Timber yard	West	20m	1879	c.1931
Parcel depot Then depot	South	20m	1969 1984	c.1984 Present
Warehouse Then car depot and motor warehouse Then depot Then garage	West	25m	1956 1970 1979 1984	c.1970 c.1979 c.1984 c.1993
Warehouse Then motor accessories warehouse	West	25m	1956 1970	c.1970 c.1982
Goods station	South	30m	1879	c.1899
Fire station	West	30m	1957	Present
Engineering works Then works Then engineering works	West	50m	1956 1961 1970	c.1961 c.1970 c.1982
Photographic works Then works	West	60m	1956 1982	c.1982 Recent
Warehouse Then motor warehouse	West	70m	1957 1969	c.1969 c.1984

Surrounding Land Uses (100m radius)	Orientation	Distance	Dates	
			From	To
Warehouse <i>Then</i> chemical warehouses <i>Then</i> warehouses	West	75m	1956 1970 1982	c.1970 c.1982 Recent
Engineering works <i>Then</i> works	West	80m	1956 1982	c.1982 c.1988

2.3.2 Site Planning History

An outline planning application was submitted to RBC for the development of the site (including an additional area to the east) in February 2011 (ref: 11/00276/OUT) and was granted consent in March 2012. The consented scheme was smaller in scale than the proposed development. An Environmental Statement (ES) was submitted, including the Arup Ground Conditions ES Chapter and Contaminated Land Preliminary Phase 1 Report (ref: 211770 Draft 3, dated March 2010). A review of these reports is provided in Section 1.4 above.

A relevant planning application is listed on RBC's website which relates to the construction of the repair workshop, located adjacent to the east of the current site under consideration (ref: 93/00902/FUL). The application was permitted on 12th January 1994. No decision notice was provided. At the time of the RPS visit in November 2018, the former vehicle repair workshop, vehicle wash and the refuelling area (all associated with the sorting office) were no longer present on site. The area had been redeveloped to comprise an external seating area, taxi rank, bicycle storage and bus stops associated with the northern entrance to Reading train station. RPS has been advised the works were completed as part of the Crossrail works at the train station. It has not been possible to obtain documentation regarding these development works to ascertain if any further site investigation and/or remediation was carried out.

The Arup Contaminated Land Preliminary Phase 1 Report refers to a planning application, dated July 1984 (ref: 85 TP 63), for the construction of general industrial buildings for the Post Office including letter sorting operation, office, car parking and access.

2.4 Environmental Setting

2.4.1 Geology

Based on BGS mapping (1:50,000-scale) and the EA Groundwater Vulnerability mapping (1:100,000-scale), the stratigraphic sequence and aquifer classifications beneath the site are indicated to be as follows:

Table 5 – Descriptions of Geological Strata

Strata	Description & approximate thickness	Aquifer Classification
Langley Silt Member	Indicated to comprise clay and silt and likely to be up to several metres in thickness beneath the site.	Unproductive Stratum
Kempton Park Gravel Member	Indicated to comprise sand and gravel and likely to be several metres in thickness beneath the site.	Secondary A Aquifer
White Chalk Subgroup	Comprises chalk with flints and be of substantial thickness beneath the site.	Principal Aquifer

Ground conditions encountered during the geo-archaeological investigation undertaken in December 2010 and January 2011 (as reported in the 2011 Ground Conditions and Contamination ES Chapter), comprised the following:

- Made Ground: Ranging in thickness from approximately 1.60m to 2.20m. Comprised gravelly sand or gravelly sandy clay with brick, ash, clinker and concrete fragments;
- Langley Silt Member: This stratum was only encountered in one of the two boreholes, at a thickness of approximately 0.90m comprising silty clay; and
- Kempton Park Gravel Member: A maximum unproven thickness of approximately 1.30m was encountered. This stratum comprised sandy gravel.

Ground conditions encountered during the intrusive investigation in October 2012, reported as part of the Arup Interpretative Report on Phase 2 Geo-Environmental Ground Investigation (ref: REP/10-2012/001/RO, dated 14th November 2012), comprised the following:

- Made Ground: Ranging in thickness from approximately 0.70m to 2.50m. Generally comprised an upper sandy/gravelly layer underlain with clayey and ashy fill;
- Langley Silt Member: Ranging in thickness from absent to approximately 2.20m, it was not encountered in two boreholes, located in the centre of the site. The stratum generally comprised silt and clay with some peat;
- Kempton Park Gravel Member: The full thickness was only proven at one location at a thickness of approximately 4.90m. This stratum comprised sand and gravel; and
- White Chalk Subgroup: The top of this stratum was only proven at one location and was recovered as structureless chalk.

As discussed previously, it is noted that Arup used the River Terrace Deposits terminology and, although the BGS mapping indicates that the Kempton Park Gravel Member is present beneath the site, it is considered that the two names can be used interchangeably in the context of this report.

2.4.2 Hydrogeology

The site is located above an Unproductive Stratum relating to the Langley Silt Member. These formations have a low permeability and have negligible significance for water supply or base flow. The underlying Kempton Park Gravel Member is classified as a Secondary A Aquifer. These formations are formed of permeable layers capable of supporting water supplies at a local scale, in some cases forming an important source of base flow to rivers. The White Chalk Subgroup is classified as a Principal Aquifer. These formations provide a high level of water storage and may support water supply and / or river base flow on a strategic scale.

According to EA data, the site is not indicated to be located in a groundwater Source Protection Zone (SPZ).

Under the Water Framework Directive, the EA's local River Basin Management Plan classifies groundwater chemical quality beneath the site as poor.

As part of the geo-archaeological investigation undertaken in December 2010 and January 2011 (as reported in the 2011 Ground Conditions and Contamination ES Chapter), groundwater levels within two monitoring wells, screened across the Kempton Park Gravel Member, were recorded at depths of approximately 1.94m and 1.95m bgl.

As part of the monitoring carried out by Ian Farmer Associates, as reported in the Factual Ground Investigation Report (ref: REP/10-2012/001/RO, dated 14th November 2012), groundwater levels within monitoring wells screened across the Kempton Park Gravel Member ranged from approximately 1.58m to 2.20m bgl. For the wells screened across the Made Ground and Langley Silt Member, groundwater levels ranged from approximately 0.96m to 2.27m bgl.

Information provided by the EA indicates that there are records of five active licensed groundwater abstractions within 1km of the site. These are detailed in the table below:

Table 6 – Licensed Groundwater Abstractions

Licence Holder	Use	Approx. Distance and Direction from Site
Manrose Manufacturing Ltd	Drinking, cooking, sanitary, washing, commercial, industrial, public services and non-evaporative cooling	375m Northwest
Primark Stores Ltd	Drinking, cooking, sanitary, washing, commercial, industrial and public services	445m South
Berendsen UK Ltd	Laundry use	585m Northeast
Hillier Group of Companies	Process water	645m West
Hillier Group of Companies	Process water	855m West

2.4.3 Surface Water

There are three watercourses within 1km of the site which are classified within a River Basin Management Plan published by the EA under the European Water Framework Directive (2000). A list of all readily identifiable nearby watercourses and water bodies is as follows:

Table 7 – Nearby Watercourses and Water Bodies

Watercourse / Body	Quality Classification	Approx. Distance and Direction from Site
River Thames	Chemical Quality: Good Ecological Quality: Moderate	210m Northeast
River Kennet	Chemical Quality: Good Ecological Quality: Moderate	700m Southeast
Holy Brook	Chemical Quality: Good Ecological Quality: Moderate	630m Southeast

Information provided by the EA indicates that there are records of two active licensed surface water abstractions within 1km of the site. The details of these are as follows:

Table 8 - Licensed Surface Water Abstractions

Licence Holder	Use	Source	Approx. Distance and Direction from Site
The Reading Sustainability Centre	Transfer between sources	River Thames	605m East
Oracle Shopping Centre Ltd	Lake and pond throughflow	River Thames	800m South

2.4.4 Fluvial / Tidal Flood Risk

According to the Environment Agency (EA) flood map, the site is located within Flood Zone 2, with the annual probability of flooding classified as greater than 1 in 1000 (0.1%) but less than 1 in 100 (1%). The floodplain appears to be associated with the River Thames to the northeast of the site.

Much of the surrounding area is also within the projected floodplain of the River Thames. The site does not appear to benefit from flood defences.

2.4.5 Ecologically Sensitive Sites

Natural England data indicates that there are no ecologically sensitive sites, that constitute environmental receptors as defined within Table 1 of the DEFRA Environmental Protection Act 1990: Part 2A - Contaminated Land Statutory Guidance (2012), located within a 1km radius of the site.

2.4.6 Radon

According to the Indicative Atlas of Radon in England and Wales published by the Health Protection Agency (part of Public Health England) and the BGS, the site is not located in an area at risk from radon gas.

2.4.7 Coal Authority

The Interactive Map Viewer on the Coal Authority website indicates that the site is not located in a coal mining reporting area.

2.5 Authorised Processes and Pollution Incidents

2.5.1 Landfills and Waste Sites

Data provided by the EA, Local Authority and BGS indicates that there are no recorded licensed or known historical landfill sites located within 250m of the site. There are also no waste treatment or transfer sites located within 250m of the site.

2.5.2 Environmental Permits

EA and Local Authority data indicates that there are three active processes regulated by an Environmental Permit (under the Environmental Permitting Regulations 2010) within 500m of the subject site. These are outlined in the table below:

Table 9 – Environmental Permits

Licence Holder	Permitted Activity	Approx. Distance and Direction from Site
Scenery Salvage	Combustion and incineration (Part B)	345m West
Snax 24 Ltd	Unloading of petrol into storage at service stations (Part B)	440m Northwest
Rivermead Accident Repair Centre Ltd	Respraying of road vehicles	475m West

2.5.3 COMAH Sites

There are no records of any operations under the Control of Major Accident Hazards (COMAH) Regulations 1999, located within 500m of the site.

2.5.4 Pollution Incidents

Environment Agency data indicates that there is one pollutant incident recorded in the northwest of the site. The pollutant was listed as general biodegradable materials and wastes and the incident occurred on 12th September 2001. The impact to land was listed as minor with no impact to water.

There are no records of any 'major' or 'significant' pollution incidents within 500m of the site.

As part of the Arup Contaminated Land Preliminary Phase 1 Report (ref: 211770 Draft 3, dated March 2010), RBC advised of two pollution incidents at the site occurring in August 1991 (chemicals to Vastern Ditch watercourse) and in September 2011 (fly tipping of green waste). No further information regarding these pollutant incidents was provided within the report.

2.6 Regulatory Consultations

An updated consultation request regarding any known contamination issues at the site was submitted to RBC. The Council advised the following:

- The site has been identified by RBC as being potentially contaminated due to its former use as a works and a coal depot; and
- The site has been identified for future investigation under the Council's Part 2A inspection strategy. The site is currently classified as a low risk. There is no schedule set for the investigation of the site.

3 OUTLINE CONCEPTUAL SITE MODEL

3.1 Background

An outline CSM consists of an appraisal of the *source-pathway-receptor* 'contaminant linkages' which is central to the approach used to determine the existence of 'contaminated land' according to the definition set out under Part 2A of the Environmental Protection Act 1990. For a risk to exist (under Part 2A), all three of the following components must be present to facilitate a potential 'pollutant linkage'.

- **Source** referring to the source of contamination (Hazard).
- **Pathway** for the contaminant to move/migrate to receptor(s).
- **Receptor** (Target) that could be affected by the contaminant(s).

Receptors include human beings, other living organisms, crops, controlled waters and buildings / structures. The National Planning Policy Framework, used to address contaminated land through the planning process, follows the same principles as those set out under Part 2A. Further details on the Part 2A regime are presented within Appendix C.

3.2 Potential Pollutant Linkages

Each stage of the potential pollutant linkage sequence has been assessed individually on the basis of information obtained during the site reconnaissance, desk study exercise and findings of the previous reports including the geo-archaeological investigation and the Arup Interpretative Report on Phase 2 Geo-Environmental Ground Investigation (ref: REP/10-2012/001/RO) and are discussed in the following section.

3.2.1 Potential Contaminant Sources

On Site

Historical mapping indicates that from at least 1879 the site comprised part of the Great Western Railway Works, which included a railway foundry, forge and saw pit. By c.1899, railway sidings associated with a coal depot were indicated to be present on site. By c.1956, the site had been redeveloped to comprise a large works building, subsequently labelled as a railway works.

By 1988, the site had been redeveloped to comprise the Royal Mail sorting office (a planning application for the redevelopment was dated 1984).

Environment Agency data indicates that there is one pollutant incident recorded in the northwest of the site. The pollutant was listed as general biodegradable materials and wastes and the incident occurred on 12th September 2001. As part of the Arup Contaminated Land Preliminary Phase 1 Report (ref: 211770 Draft 3, dated March 2010), RBC advised of two pollution incidents at the site occurring in August 1991 (chemicals to Vastern Ditch watercourse) and in September 2011 (fly tipping of green waste).

An electricity substation is currently located in the northwest of the site. A disused generator with some evidence of hydrocarbon staining is located in the northwest of the site.

Made Ground is known to be present beneath the site, this could represent a potential source of contaminants of concern and / or ground gas.

As part of the 2011 geo-archaeological investigation, lead was recorded at concentrations in excess of the residential AC in two of the samples of Made Ground, but below the commercial AC. Ammoniacal nitrogen, several speciated PAHs and TPH compounds were recorded at concentrations in excess of their AC within the two groundwater samples collected from monitoring wells located in the centre of the site.

As part of the 2012 investigation, visual and olfactory evidence of contamination was observed within the Made Ground and Langley Silt Member at borehole CP12-01, which is located within the vicinity of the former vehicle refuelling area (outside the current site boundary). Soil analytical results were compared to GAC using the standard UK CLEA model for both commercial and residential (without plant uptake) end use scenarios. No exceedances against commercial criteria were reported. Slight exceedances of concentrations of lead in four samples of Made Ground were recorded for the residential use (three of the locations are within the current boundary and one outside the boundary to the east). The proposed building cover, hardstanding and clean cover in any areas of soft landscaping would mitigate any potential risks to future on site human health receptors via the pathways of dermal contact and ingestion. Aliphatic hydrocarbons in the sample of Made Ground collected from borehole CP12-01 (this is not located within the current development area). Asbestos was identified in three of the 27 samples of Made Ground. All three samples were reported to comprise chrysotile asbestos fibres. Subsequent quantification testing indicated that all samples had less than 0.001% by mass of asbestos. Groundwater analytical results were compared to EQS or UK DWS. The results indicated that the quality of groundwater beneath the site was good and there was no evidence of any significant contamination. The only exceedances related to ammoniacal nitrogen, which was recorded at elevated concentrations within two of the groundwater samples. Very limited ground gas monitoring was undertaken, which indicated that ground gas protection measures would not be required for the current development area.

It is noted that a basement level is proposed to be constructed across the eastern portion of the site and a small area in the southwest corner. The removal of Made Ground and potentially Langley Silt Member in these areas would remove any potentially contaminated material.

Off-Site

Historical maps indicate that a coal depot extended off-site to the north of the site from at least 1899 to c.1956. Railway sidings were located adjacent to the north, south and east of the site from 1899 to c.1989. Additional historical land uses include malthouses, a timber yard, a parcel depot and a number of warehouses and works.

A former vehicle maintenance workshop, vehicle wash and refuelling area (all associated with the Royal Mail sorting office) were located adjacent to the east of the current site boundary. Planning permission for the construction of the vehicle maintenance workshop was granted in January 1994. At the time of the RPS visit in November 2018, the former vehicle repair workshop, vehicle wash and the refuelling area were no longer present. The area had been redeveloped to comprise an external seating area, taxi rank, bicycle storage and bus stops associated with the northern entrance to Reading train station. RPS has been advised the works were completed as part of the Crossrail works at the train station. It has not been possible to obtain documentation regarding these development works to ascertain if any further site investigation and/or remediation was carried out.

An electricity substation is located adjacent to the north of the site.

No other current potentially contaminative land uses were identified in the surrounding area at the time of the site visit.

3.2.2 Potential Pathways

In areas of the site covered by buildings or hardstanding the risks to future on site human health receptors via the pathways of dermal contact and ingestion will be mitigated. However, in areas of soft landscaping, the pathways of dermal contact and ingestion could still be active. In addition, there would be potential for the airborne migration of soil/dust from these areas.

There is the potential for ground gas and volatile contaminants of concern in soil and/or groundwater beneath the site to impact future site users via the inhalation pathway in indoor areas.

The site is indicated to be underlain by the relatively impermeable Langley Silt Member, which will likely limit the lateral off-site migration of contaminants of concern via groundwater. However, this stratum was indicated to be absent in one borehole advanced as part of the 2011 geo-archaeological site investigation and two of the boreholes advanced across the centre of the site as part of the 2012 site investigation. Therefore, this migration could be facilitated by any perched groundwater within

Made Ground and the underlying Kempton Park Gravel Member. Contaminants of concern may impact off-site human health receptors via the dermal contact, ingestion and vapour inhalation pathways.

Contaminants of concern in shallow soils and/or groundwater could migrate vertically into the deeper Kempton Park Gravel Member and the underlying White Chalk Subgroup.

3.2.3 Potential Receptors

Potential human health receptors include future site users and off-site human health receptors.

Providing construction workers adopt appropriate levels of hygiene and personal protective equipment, they are not considered to be at significant risk from potential contaminants of concern and have not been considered further as part of this assessment.

The site is underlain by the Langley Silt Member which is classified as an Unproductive Stratum and, as such, it is not considered to represent a potential controlled water receptor.

The underlying Kempton Park Gravel Member Secondary A Aquifer and the White Chalk Subgroup Principal Aquifer are considered to be potential controlled waters receptors.

Two potable groundwater abstraction points are indicated to be located within 1km of the site, the nearest of which is located approximately 375m to the northwest. The nearest surface water feature is the River Thames, which is located approximately 210m to the northeast of the site. Given the distance to these features and the anticipated groundwater flow direction (considered by Arup to be from west to east), they are not considered to be at significant risk from any contamination sourced from beneath the site.

3.3 Outline Conceptual Site Model

An outline CSM has been developed on the basis of the site reconnaissance and desk study. The CSM is used to identify potential sources, pathways and receptors (i.e. potential pollutant linkages) on site and is summarised in the table below:

Table 12 – Outline Conceptual Site Model

Potential Source	Contaminants of Concern	Via	Potential Pathways	Linkage Potentially Active?	Receptors
On site – current: Electricity substation, disused generator and Made Ground On site – historical: Great Western Railway Works, railway sidings associated with a coal depot, railway works, Royal Mail sorting office and three pollution incidents	Metals, hydrocarbons, asbestos and polychlorinated biphenyls (PCBs)	Soil	Direct contact/ingestion	✓	Future site users
			Inhalation of volatiles	✓	
			Airborne migration of soil or dust	✓	Off-site users
			Leaching of mobile contaminants	✓	Kempton Park Gravel Member Secondary A Aquifer White Chalk Subgroup Principal Aquifer
		Groundwater	Direct contact/ingestion	✓ ✓	Future site users Off-site users
			Inhalation of volatiles	✓ ✓	Future site users Off-site users
			Vertical and lateral migration in permeable strata	✓ ✓	Kempton Park Gravel Member Secondary A Aquifer White Chalk Subgroup Principal Aquifer
Off-site – current: Electricity substation Off-site – historical: Vehicle repair workshop, vehicle wash and refuelling area (associated with Royal Mail sorting office), coal depot, railway sidings, malthouses, timber yard, parcel depot and a number of warehouses and works	Metals, hydrocarbons, solvents and PCBs	Groundwater	Direct contact/ingestion	✓	Future site users
			Inhalation of volatiles	✓	Future site users
On and off-site – Made Ground / natural strata or bio-degradation of contamination.	Carbon dioxide and methane	Ground Gas	Inhalation of ground gas	✓ ✓	Future site users Off-site users
			Explosive risks	✓ ✓	Future site users Off-site users

The risk assessment is based upon the available information relating to the site. Should ground conditions inconsistent with those outlined in this report be encountered RPS should be contacted to enable further assessment

4 CONCLUSIONS AND RECOMMENDATIONS

Based on the intrusive investigations undertaken across the site to date, it is not considered that there would be significant risks to identified sensitive receptors following the redevelopment of the site.

Whilst the coverage of exploratory holes across the majority of the site as part of the previous site investigations would be considered generally acceptable for the purpose of due diligence (for which they were originally undertaken six to eight years ago), updated assessment is considered necessary with particular attention to data gaps identified from the previous reports. It is therefore recommended that additional Phase 2 Environmental Site Investigation be carried out to provide an assessment of the current status of soil and groundwater beneath the site, in addition to the current ground gas regime. This should include the following:

- Drilling of a number of additional boreholes/trial pits across the site;
- Installation of groundwater and gas monitoring wells in selected boreholes;
- Collection of soil and groundwater samples from beneath the site with chemical analysis of these samples for contaminants of concern. It is also recommended that a survey is undertaken, to assess whether the existing monitoring wells on site are serviceable. If so, groundwater samples should also be collected from these locations;
- Ground gas monitoring from wells installed at the site;
- Assessment of ground conditions and generic quantitative risk assessment of soil and groundwater chemical analysis results to determine the potential for potential pollutant linkages to remain active upon redevelopment of the site; and
- Provision of recommendations (where necessary) for remediation/mitigation measures to ensure that any identified potential pollutant linkages are not active upon redevelopment of the site.

It would be prudent to combine any site investigation undertaken for environmental purposes with geotechnical testing, in order to facilitate preliminary foundation, basement and pavement design.

FIGURES

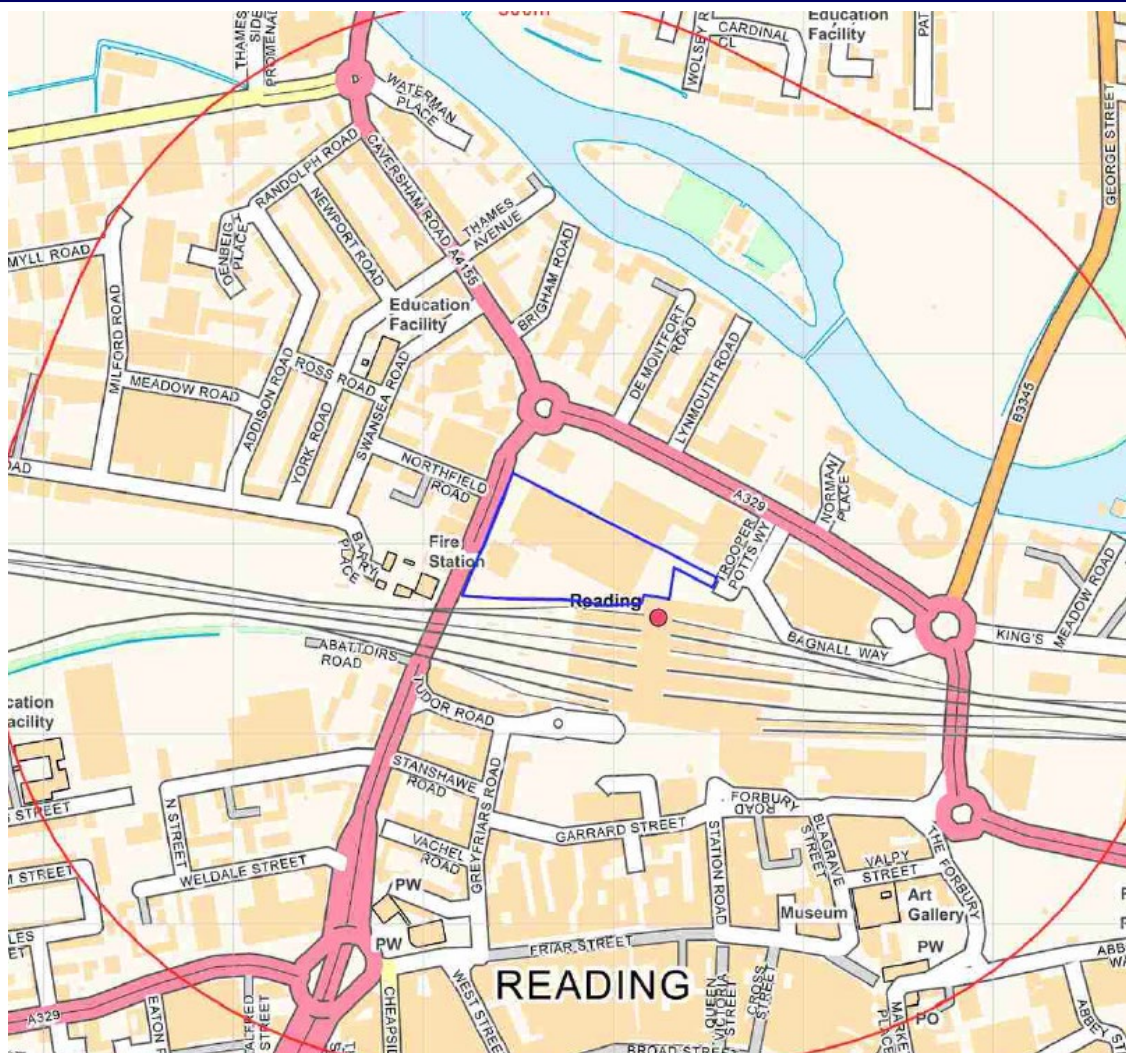


Figure 1: Site Location Plan

Map Date: Current

Scale: Not to scale

RPS
35 New Bridge Street
London
EC4V 6BW

☎ 020-7280-3240
🌐 www.rpsgroup.com

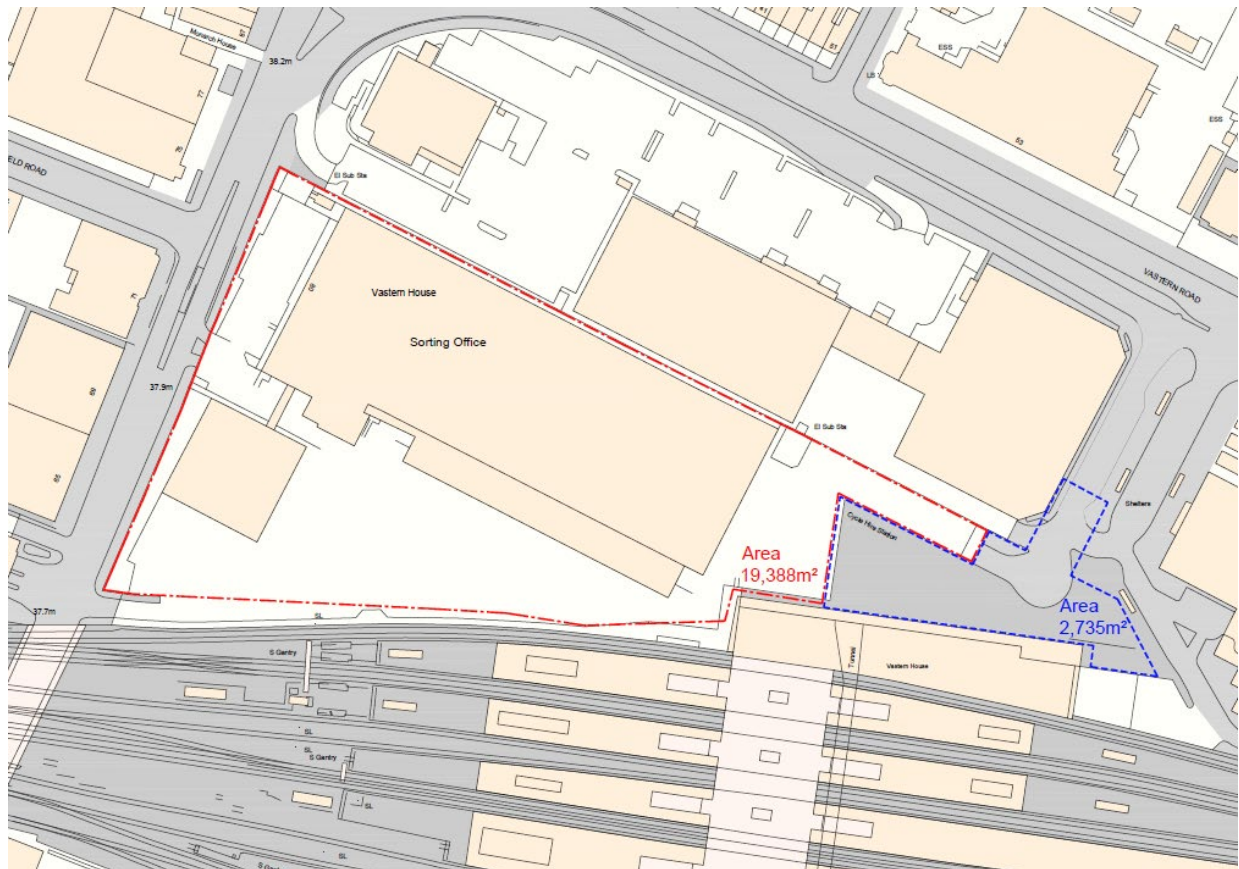


Figure 2: Site Boundary Plan

Map Date: Current

Scale: Not to scale

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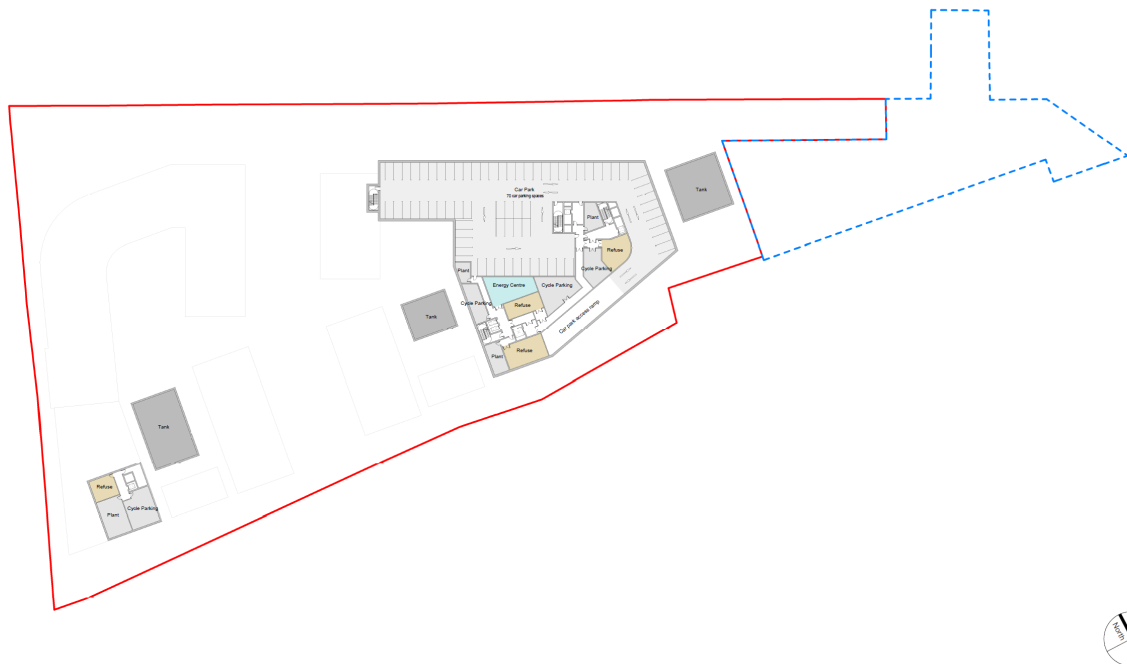


Figure 3a: Proposed Basement Plan

Scale: Not to scale

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Figure 3b: Proposed Ground Floor Plan

Scale: Not to scale

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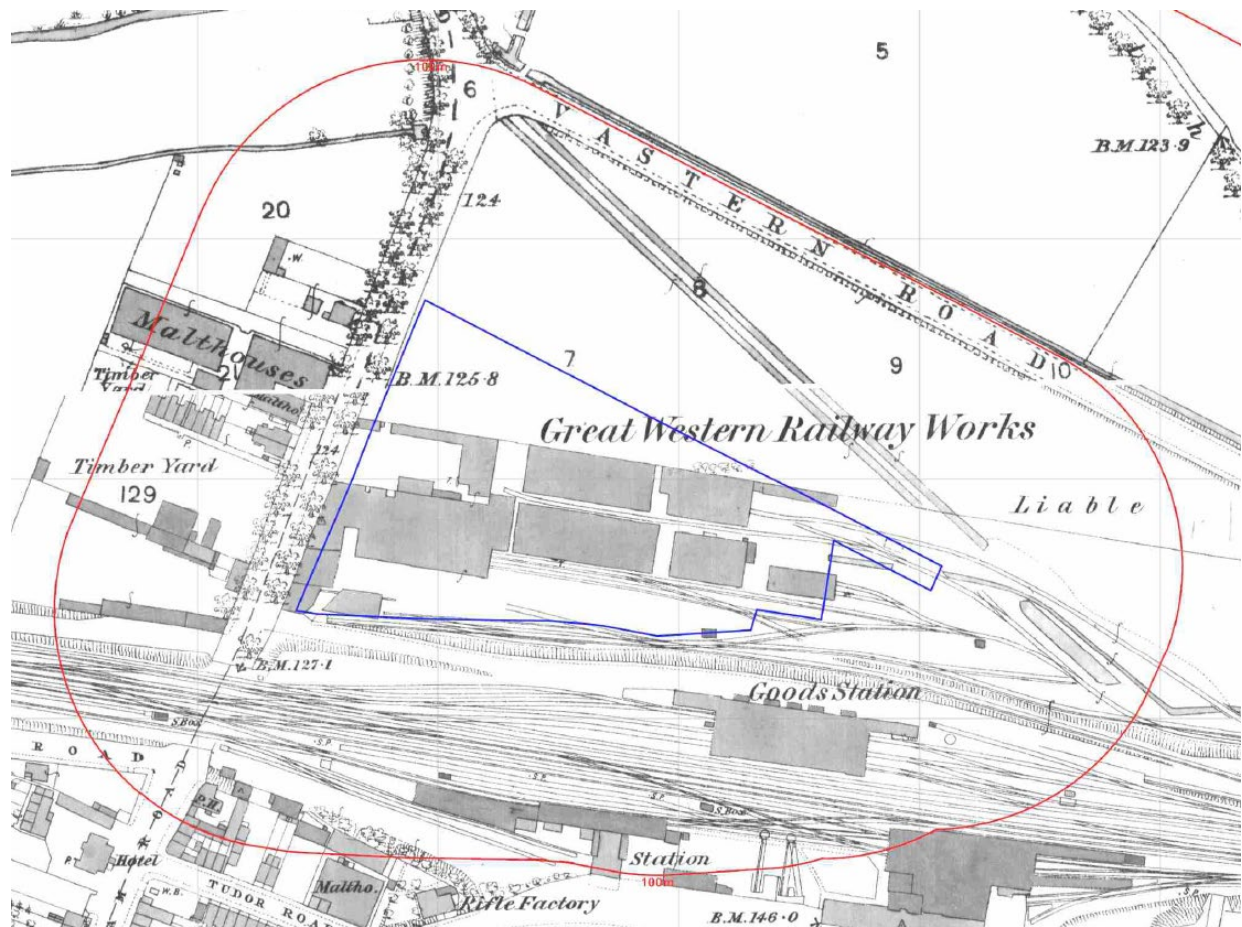


Figure 4: Historical Map Extract

Map Date: 1879

Scale: Not to scale

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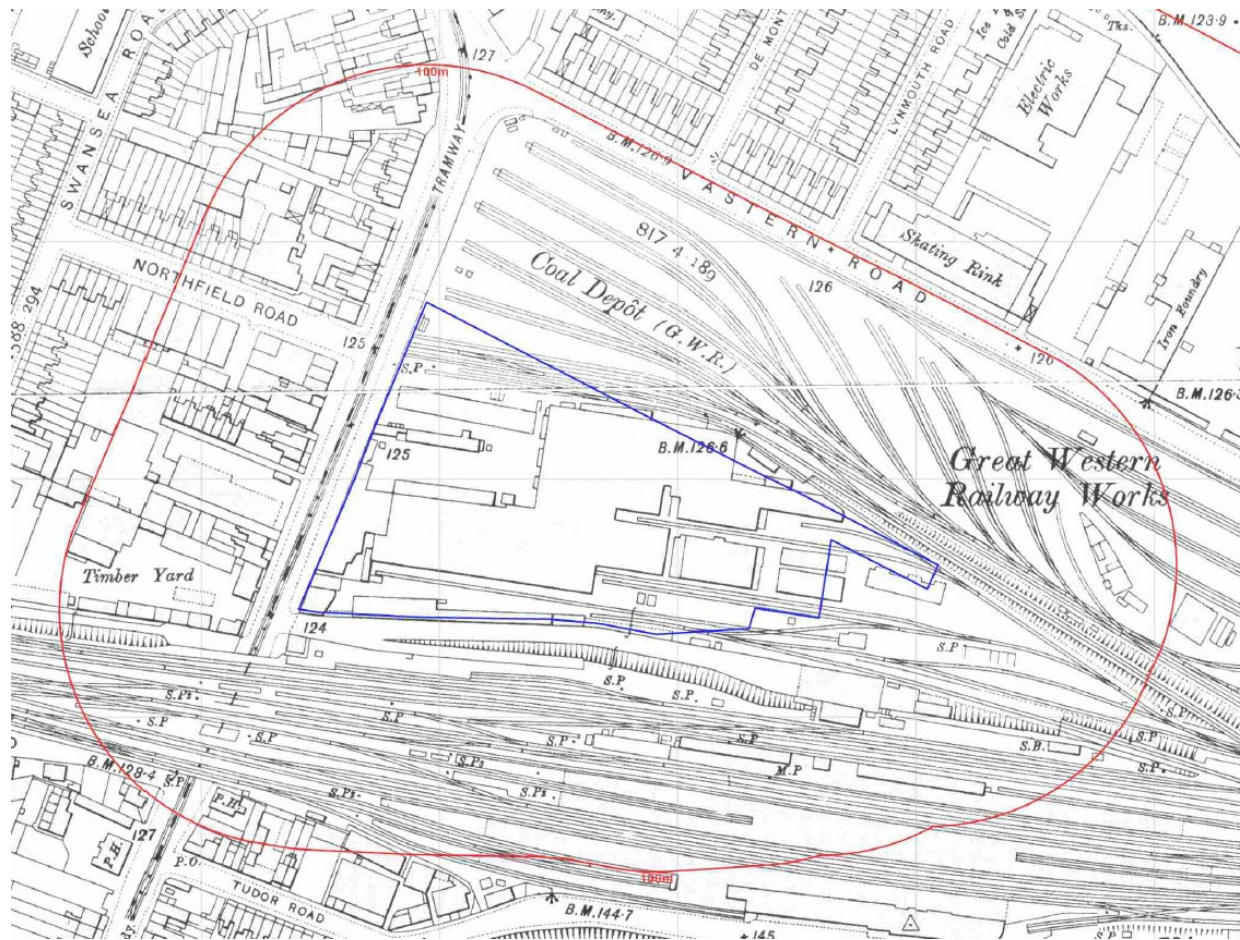


Figure 5: Historical Map Extract

Map Date: 1912

Scale: Not to scale

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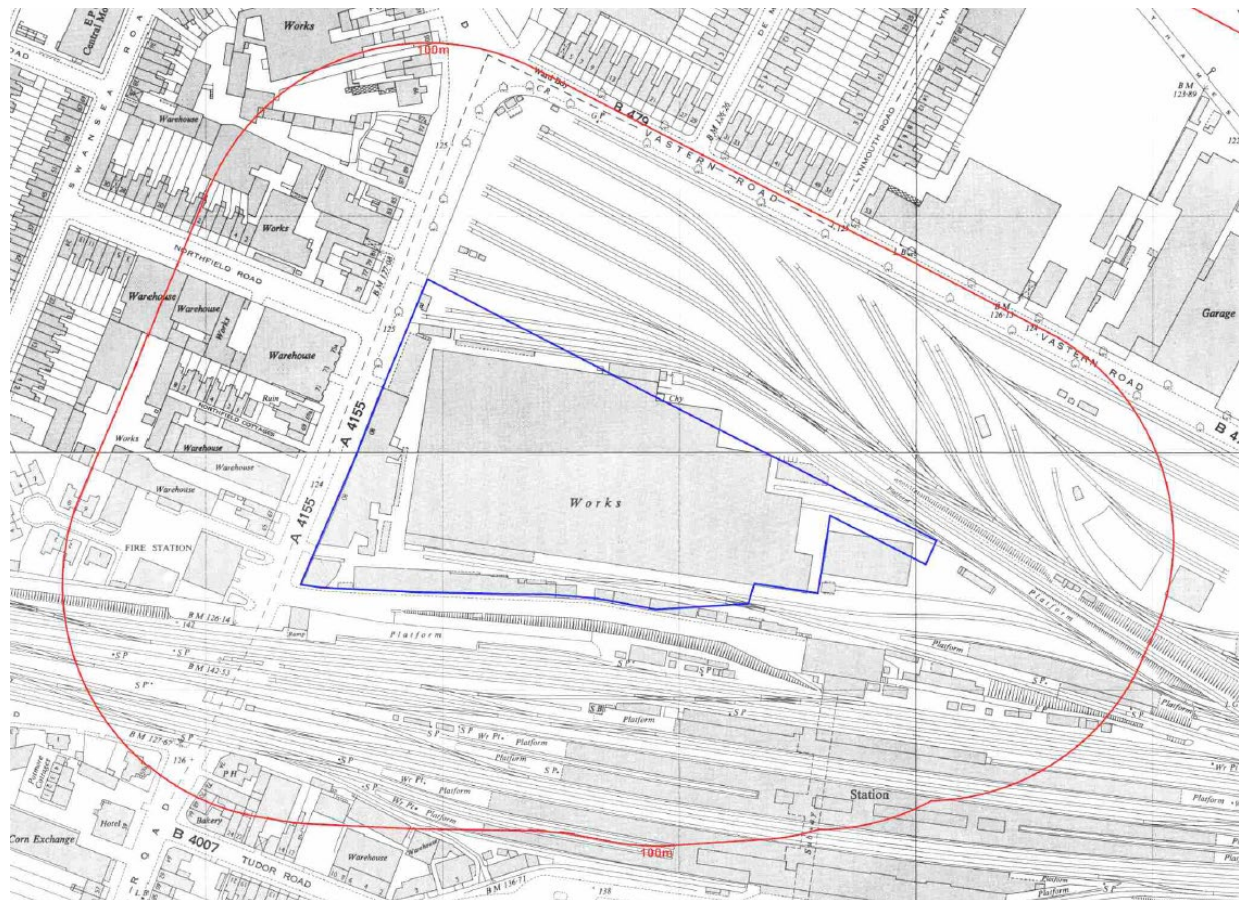


Figure 6: Historical Map Extract

Map Date: 1961

Scale: Not to scale

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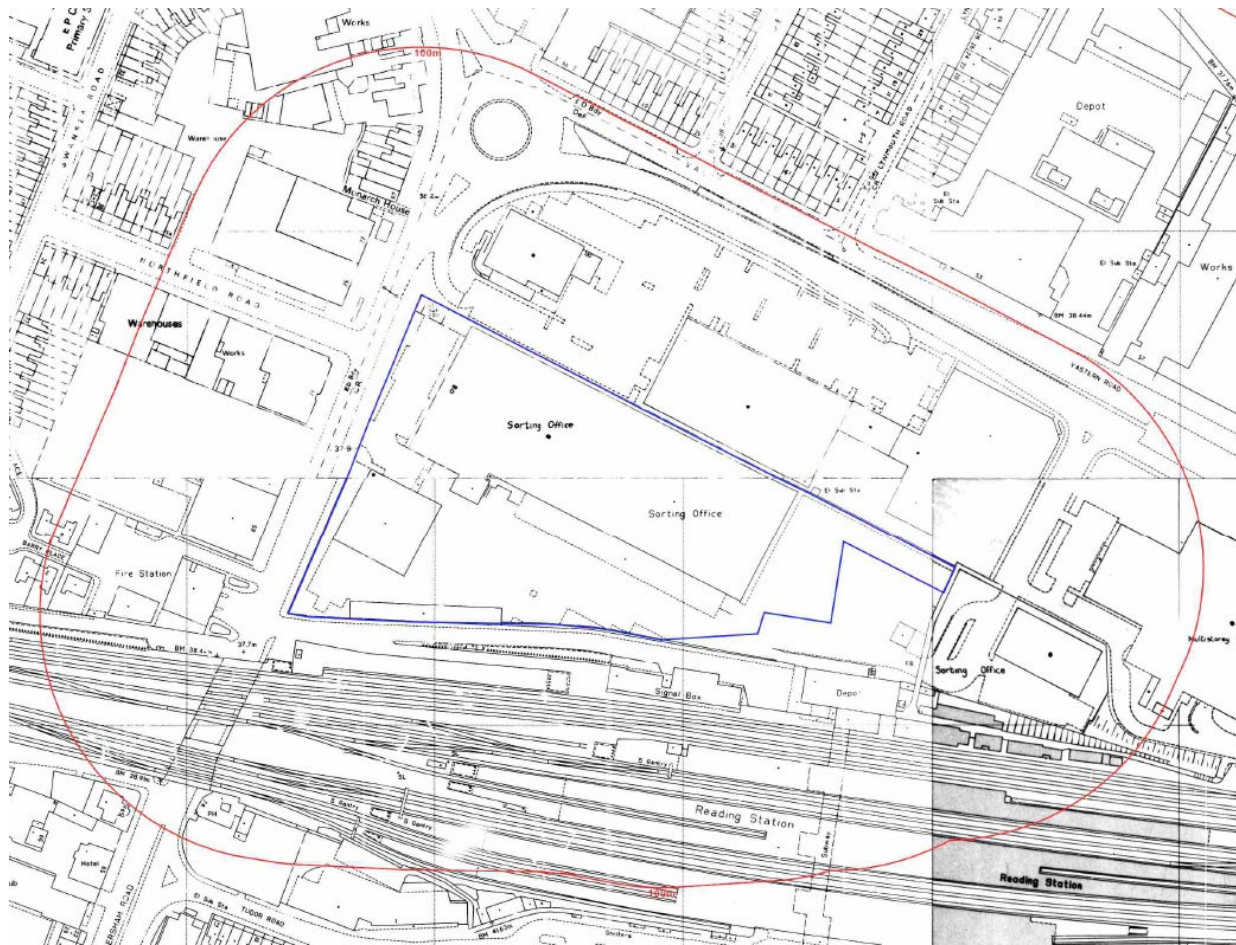


Figure 7: Historical Map Extract

Map Date: 1988 to 1993

Scale: Not to scale

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APPENDIX A

General Notes

RPS Consulting Services Ltd

Phase 1 - Environmental Risk Assessment / Desk Study Environmental Review

General Notes

1. A "desk study" means that no site visits have been carried out as any part thereof, unless otherwise specified.
2. This report provides available factual data for the site obtained only from the sources described in the text and related to the site on the basis of the location information provided by the Client.
3. The desk study information is not necessarily exhaustive and further information relevant to the site may be available from other sources.
4. The accuracy of maps cannot be guaranteed and it should be recognised that different conditions on site may have existed between and subsequent to the various map surveys.
5. No sampling or analysis has been undertaken in relation to this desk study.
6. Any borehole data from British Geological Survey sources is included on the basis that: "The British Geological Survey accept no responsibility for omissions or misinterpretation of the data from their Data Bank as this may be old or obtained from non-BGS sources and may not represent current interpretation".
7. Where any data supplied by the Client or from other sources, including that from previous site investigations, have been used it has been assumed that the information is correct. No responsibility can be accepted by RPS for inaccuracies in the data supplied by any other party.
8. This report is prepared and written in the context of an agreed scope of work and should not be used in a different context. Furthermore, new information, improved practices and changes in legislation may necessitate a re-interpretation of the report in whole or in part after its original submission.
9. The copyright in the written materials shall remain the property of the RPS Company but with a royalty-free perpetual licence to the Client deemed to be granted on payment in full to the RPS Company by the Client of the outstanding amounts.
10. The report is provided for sole use by the Client and is confidential to them, their professional advisors, no responsibility whatsoever for the contents of the report will be accepted to any person other than the Client. [Unless otherwise agreed]
11. These terms apply in addition to the RPS "Standard Terms & Conditions" (or in addition to another written contract which may be in place instead thereof) unless specifically agreed in writing. (In the event of a conflict between these terms and the said Standard Terms & Conditions the said Standard Terms & Conditions shall prevail.) In the absence of such a written contract the Standard Terms & Conditions will apply.



APPENDIX B

Photographs

Photo 1: Forming sorting office warehouse with enclosed walkway (visible in right of photo) located at first floor level.

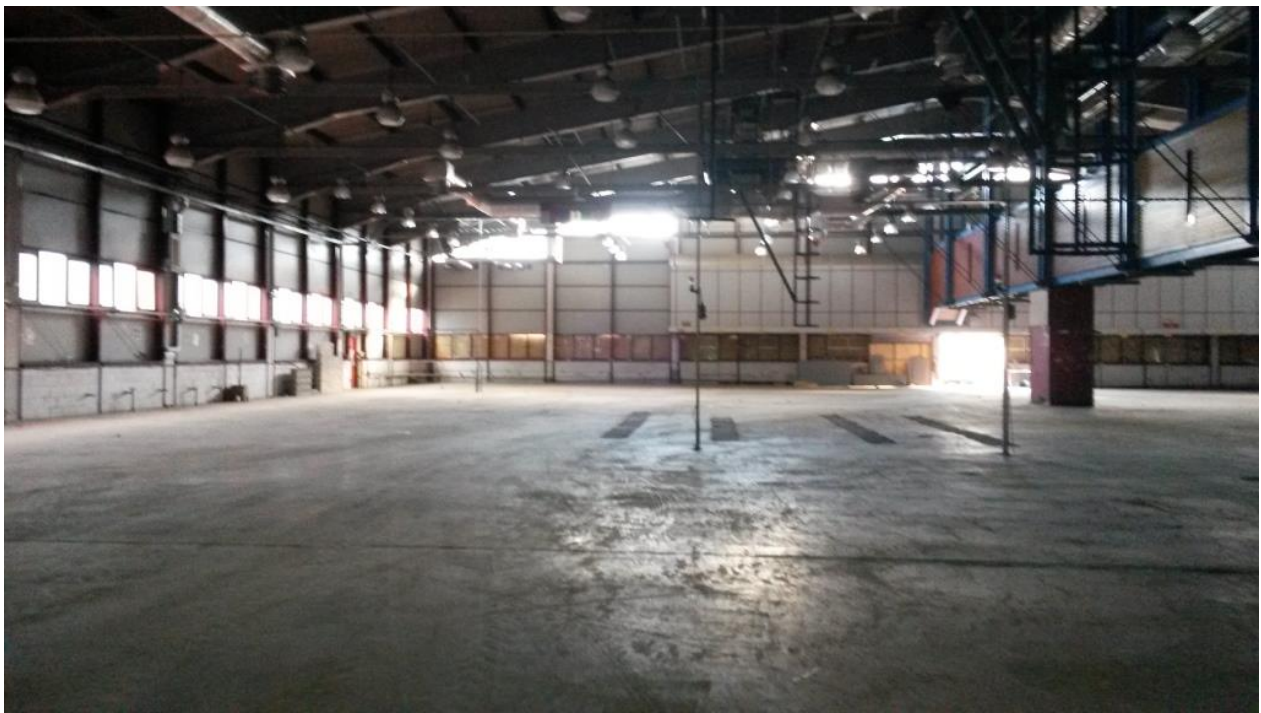


Photo 2: Raised concrete platform located to the south of the former sorting office.



Photo 3: View of the office building to left with roller shutter doors of sorting office to right and walkway connected the two building in the background.



Photo 4: Overgrown likely former air handling equipment.



Photo 5: Southern boundary of the site with area of gravel.



Photo 6: Ventilation pipe located behind three adjacent drains, indicating the presence of an oil/water interceptor.



Photo 7: Significant staining noted internally to the generator unit, in the northwest of the site.

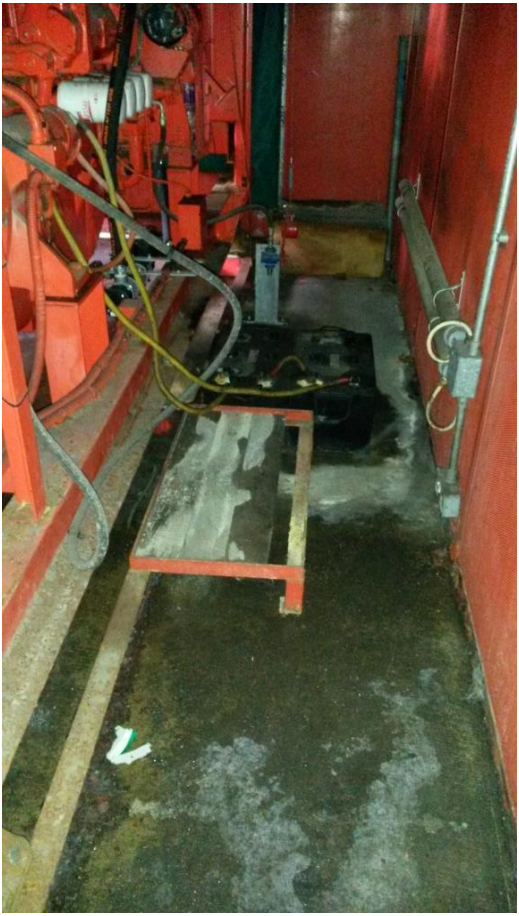


Photo 8: Minor staining noted on the concrete base externally to the generator unit.



APPENDIX C

Part 2A (The Contaminated Land Regime)

Contaminated Land Definition

Under Section 57 of the Environmental Act 1995, Part 2A was inserted into the Environmental Protection Act 1990 to include provisions for the management of contaminated land.

Subsequent regulations were first implemented in England in April 2000, Scotland in July 2000 and Wales in July 2001¹, providing a definition of 'contaminated land' and setting out the nature of liabilities that can be incurred by owners of contaminated land and groundwater.

According to the Act, contaminated land is defined as 'any land which appears to the local authority in whose area the land is situated to be in such a condition, by reason of substances in, on or under the land that:

- a) *significant harm* is being caused or there is a *significant possibility* of such harm being caused; or
- b) *significant pollution* of controlled waters² is being caused or there is a significant possibility of such pollution being caused³

The guidance on determining whether a particular possibility is significant is based on the principles of risk assessment and in particular on considerations of the magnitude or consequences of the different types of significant harm caused. The term 'possibility of significant harm being caused' should be taken, as referring to a measure of the probability, or frequency, of the occurrence of circumstances that could lead to significant harm being caused.

The following situations are defined where harm is to be regarded as significant:

- i. Chronic or acute toxic effect, serious injury or death to humans
- ii. Irreversible or other adverse harm to the ecological system
- iii. Substantial damage to, or failure of, buildings
- iv. Disease, other physical damage or death of livestock or crops
- v. The pollution of controlled waters⁴.

¹ In England by The Contaminated Land (England) Regulations 2000, updated by The Contaminated Land (England) (Amendment) Regulations 2012; in Scotland by The Contaminated Land (Scotland) Regulations 2000, updated by the Contaminated Land (Scotland) Regulations 2005; and in Wales by The Contaminated Land (Wales) Regulations 2001, updated by the Contaminated Land (Wales) Regulations 2006.

² In Scotland the term "controlled water" has been updated to "water environment" under the Contaminated Land (Scotland) Regulations 2005 in line with the Water Environment and Water Services (Scotland) Act 2003.

³ The definition was amended in 2012 by implementation of the Water Act 2003.

⁴ Groundwater in this context does not include waters within underground strata but above the saturated zone.

With regard to radioactivity, contaminated land is defined as ‘any land which appears to be in such a condition, by reason of substances in, on or under the land that harm is being caused, or there is a *significant possibility of such harm being caused*⁵’.

The Risk Assessment Methodology

Risk assessment is the process of collating known information on a hazard or set of hazards in order to estimate actual or potential risks to receptors. The receptor may be humans, a water resource, a sensitive local ecosystem or future construction materials. Receptors can be connected with the hazard via one or several exposure pathways (e.g. the pathway of direct contact). Risks are generally managed by isolating or removing the hazard, isolating the receptor, or by intercepting the exposure pathway. Without the three essential components of a source (hazard), pathway and receptor, there can be no risk. Thus, the mere presence of a hazard at a site does not mean that there will necessarily be attendant risks.

The Risk Assessment

By considering where a viable pathway exists which connects a source with a receptor, this assessment will identify where pollutant linkages may exist. A pollutant linkage is the term used by the DEFRA in their standard procedure on risk assessment. If there is no pollutant linkage, then there is no risk. Therefore, only where a viable pollutant linkage is established does this assessment go on to consider the level of risk. Risk should be based on a consideration of both:

- The likelihood of an event (probability) - takes into account both the presence of the hazard and receptor and the integrity of the pathway.
- The severity of the potential consequence - takes into account both the potential severity of the hazard and the sensitivity of the receptor.

For further information please see the Contaminated Land section on the DEFRA website (www.defra.gov.uk).

⁵ The Radioactive Contaminated Land (Modification of Enactments) (England) Regulations 2006 and Contaminated Land (Wales) Regulations 2006.