

building & project consultants



Phase I

Preliminary Risk Assessment For former British Airways and Vodafone Plots

Former British Airways and Vodafone Plots, North Hyde Gardens, Hayes, UB3 4QQ

A REPORT PREPARED

FOR AND ON BEHALF OF ARK DATA CENTRES LIMITED

C/O HURLEY PALMER FLATT

Issue Date: 11 November 2021
Revision NO: D
Revision Date: 11 November 2021



ISSUING OFFICE: Paragon, The Harlequin Building, 65 Southwark Street, London DE1 0HR
Tel: 020 7125 0112

DATE: 11 November 2021

REFERENCE: 19.0633/CB/NW

REPORT PREPARED BY: Charlie Bruinvels BSc MSc MCIWEM

REPORT CHECKED BY: Charlie Knox MSc CEnv

SIGNATURE:

For and on behalf of
Paragon Building Consultancy Limited

H Critical or high risk issue for urgent management attention




MH Moderate to high risk issue considered as a significant management item

M Medium risk issue for ongoing management or action

LM Low to medium risk issue that may require management or action

L Low risk item or for information only

KEY ISSUES

	<p>The following issues represent the key matters for consideration as a result of our Phase 1 Environmental Audit with regards to ground conditions as part of the proposed construction of a data centre, MV energy centres and substation on the former British Airways and Vodafone plots.</p>	
1.	<p>Based on the historical use of the site as a creosote works, railway, power station and having an indication of ground workings and landfilling, there are a number of potential contaminants that could exist beneath the site. Based on the permeable gravel that underlies the site, contaminants have the potential to migrate to future users of the site as vapours and gas or through direct contact in areas of proposed soft landscaping. In addition, contaminants may migrate off-site into the adjacent water courses or impact the underlying Principal Aquifer (Lynch Hill Gravel). Further investigation is required to determine the risks of the historical site use on site users and Controlled Waters.</p>	
2.	<p>Online information indicates that there were several bomb strikes around the site area and so a survey for Unexploded Ordnance should be completed.</p>	
3.	<p>This document has been prepared to discharge Condition 31(1) and to inform the partial discharge of Condition 33 for planning ref. 75111/APP/2020/1955. As agreed with the London Borough of Hillingdon, given the above, the approach taken is for Conditions 31 and 33 to be discharged in connection to the whole site with the exception of the Abellio plot. The overall effect is that Conditions 31 and 33 will be partially discharged.</p>	

ENVIRONMENTAL RISK RATING

Based on the findings of this report, there are likely to be viable pollutant linkages associated with the proposed development. There is considered to be a **medium to high** risk from residual contaminants present on site causing significant harm to human health and a moderate to high risk to Controlled Waters.

RECOMMENDATIONS AND COST

It is recommended that an intrusive ground investigation is completed to establish whether contamination pathways, identified by this audit, are viable. This investigation should comprise boreholes to assess soil contamination potential, ground gas and groundwater condition. This work was completed in 2020 and reported under separate cover.

Geotechnical testing should be completed to identify potential constraints and key parameters for foundation and slab design etc. In addition, due to the presence of the London Clay Formation below the site, sulphate testing should be completed to assess the potential for aggressive ground conditions for concrete design.

A UXO Desk Study should be completed and an on-site presence by a UXO specialist may be required to check each borehole as it is advanced.

This report should be submitted to the Local Planning Authority.

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PHASE 1 ENVIRONMENTAL RISK

ASSESSMENT

CLIENT NAME: Ark Data Centres Limited c/o
Hurley Palmer Flatt

PROPERTY ADDRESS: Former British Airways and
Vodafone Plots
North Hyde Gardens, Hayes

INSPECTION DATE: 20 June 2019 and 22 January 2020



1.0 KEY AUDIT FINDINGS

1.1	Introduction	
1.1.1	This assessment has been carried out in general accordance with current UK best practice, requirements of the National Planning Policy Framework, Land Contamination: Risk Management (LCRM) 2020, Part IIA of the Environmental Protection Act (EPA) 1990 and CIRIA Contaminated Land Risk Assessment Guide to Good Practice C552.	L
1.2	Development Proposals	
1.2.1	The development proposals include site clearance and preparation, including the demolition of remaining buildings, and the redevelopment of the site to provide: a new data centre, two MV Energy Centres, a HV Sub-Station, a visitor reception centre, plant, the creation of a new footpath and cycleway link to the canal towpath, works to the highway, car parking, cycle parking, associated infrastructure, enclosures and necessary physical security systems, hard and soft landscaping (including works to the River Crane) and ancillary uses, as well as associated external works.	L
1.3	Environmental Site Assessment	
1.3.1	The wider Bulls Bridge Industrial Estate site comprised five main parcels of land with access roads, and each land parcel is predominantly used for commercial and industrial uses and summarised below. <ul style="list-style-type: none"> • Vodafone RMC House (now demolished) • British Airways (BA); • Abellio Bus Garage (Abellio) (not in current proposals); • Addison Lee (not in current proposals) and • FM Conway (not in current proposals). 	L M

1.3.2

The development plot comprises the Vodafone plot and BA plot. The building on the Vodafone plot has now been demolished, but at the time of the inspection comprised a detached office block arranged over three floors with a reception atrium at ground floor and a roof terrace at 3rd floor level with external back-up generator and above ground fuel storage tank (AST). The AST has also been removed. The British Airways (BA) plot was used as a British Airways Component Engineering depots which has now demolished.

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1.3.3

The site is situated in a predominantly commercial/industrial part of Hayes. The development site (BA and Vodafone) is immediately surrounded by the Grand Union Canal to the south, a bus garage to the southwest, Addison Lee taxi maintenance garage to the west, a railway to the north, and an industrial estate to the east. No sensitive land uses have been identified within the vicinity of the site. The nearest residential property is some 300m southwest of the site.

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1.4 Historical Land Use

1.4.1

The earliest available map from 1865 shows the site as mostly vacant with a river running north to south along the eastern part of the site. This map also shows a railway and creosoting works in the northeast corner. By 1932, the creosoting works had extended into the site and a building was shown in the centre. Excavations and ground workings were noted onsite by 1963 to 1964. The creosoting works were no longer shown by 1973 and a power station with chimney was shown in the western part of the site by 1983. By 2002, the power station was no longer shown and the British Airways building was shown. The building on the Vodafone plot was constructed by 2010. A review of planning applications has not identified relevant information to this report. Historical map extracts are provided in Appendix 3.

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H

1.4.2

The surrounding area has supported various industrial (potentially contaminative) land uses, including factories (50m all directions), brick fields (200m northwest), mills (200m northwest), railway (10m north), electricity substation (100m south), creosoting works (1m east and northeast), and rubber works (200m east).

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1.4.3

Online information indicates that there were several bomb strikes recorded around the site during World War II.





M






Accessed: <http://bombsight.org/#16/51.5028/-0.4112>

1.5	Potential Sources of Current and Historical Contamination	
1.5.1	Potential onsite sources of contamination include an above ground fuel tank (ASTs) was noted in the northeast corner of the Vodafone plot (now removed). It is possible that spillages of fuel could result in petroleum hydrocarbons in the soil and groundwater. However, during the inspection, the tank appeared to be in good order with no obvious damage or staining to surrounding ground. The tank was noted to be within a concrete bund.	
1.5.2	There are also potential sources of contamination from the historical use of the site as a creosote works and suspected landfilling. Contaminants of concern include ground gas, vapour, petroleum hydrocarbons, polyaromatic hydrocarbons, volatile organic compounds and semi-volatile organic compounds, asbestos and heavy metals.	
1.5.3	In addition, the historical use of the surrounding area as brickfields, creosote works, factories and railway may have introduced heavy metals, asbestos, polyaromatic hydrocarbons, petroleum hydrocarbons, polychlorinated biphenyls, volatile organic compounds and semi-volatile organic compounds.	
1.6	Environmental Setting	
1.6.1	Geological environmental and mapping data records summarised in Appendix 4 and Appendix 5 respectively indicate that the site is underlain by Lynch Hill Gravel, a Principal Aquifer of high permeability, over the London Clay, an Unproductive Strata. An area of artificial ground is also present onsite. There is one groundwater abstraction within a 1km radius which is approximately 530m southeast of the site and is used for evaporative cooling. The site is not located within a Source Protection Zone.	
1.6.2	A borehole record obtained from BGS records and located onsite indicates the ground conditions comprise Made Ground (clay with ash and clinker) to 4.0m bgl over Silty Clay to 4.5m bgl, over Sand and Gravel to 7.5m over Clay to 19.45m bgl where the borehole was terminated. Groundwater was identified at 4.0m bgl.	
1.6.3	The River Crane/Yeading Brook forms the eastern boundary of the site and is considered a sensitive receptor. Whilst the river is situated at a lower elevation than the site, the underlying gravels may facilitate the migration of contaminants (if present). There are no active surface water abstraction points located within a 1km radius of the site.	
1.6.4	The Grand Union canal is 10m south of the site but is likely to be canalised which would restrict pathways to the watercourse. However, the construction of the canal is not known exactly.	

1.7	Sensitivity Analysis	
1.7.1	The potential for residual contamination to be present as a result of the longstanding industrial use of the site cannot be discounted. The perceived permeability of the underlying gravel may facilitate the migration of soil and groundwater contamination, if present, off the site. The Principal Aquifer beneath the site is classified as Controlled Waters and regulated by the EA. Additionally, the nearby surface water feature may be in hydraulic continuity with the shallow water table. Therefore, the likelihood of historical onsite contamination potentially impacting the aquifer and river cannot be discounted. Consequently, a ground investigation will be required to establish the impact (if any) of site borne contamination to Controlled Waters.	M
1.7.2	As such, pollutant linkages have been identified between soil contamination, ground gas and vapours at the site (from earlier landfilling) to site users through ingestion, inhalation and dermal contact. Potential pollutant linkages have also been identified for gas /vapour ingress into the building impacting site users. Additionally, there are potential impacts to the Principal Aquifer and River Crane through the migration of contaminants in the underlying gravels towards the river.	M
1.7.3	The risks to off site residents has been identified as low due to the distance from the site and the presence of the Grand Union Canal between the site boundary and residential properties.	L
1.7.4	Based on the above, further investigations are required to quantify the risks and provide recommendations to facilitate the development. At this stage chemical analysis of soil and groundwater should be completed by drilling boreholes, gas monitoring should be undertaken on boreholes and a risk assessment should be prepared.	M
1.8	Flood Risk	
1.8.1	The Environment Agency website indicates that part of the site immediately along the banks of the River Crane is located within a Zone 3 flood plain with an estimated annual probability of fluvial flooding of greater than 1 in 100 years. As such, there is a moderate to high risk of flooding along the watercourse and the banks itself. However, the majority of the site is in a Zone 1 flood plain, meaning the risk of flooding is less than 1 in 1,000 in any given year. As such, the site is considered to have a medium risk of flooding.	M
1.9	Waste	
1.9.1	A review of the Groundsure data pack indicated that the site was formerly used as a landfill which accepted inert, commercial and household waste until 1936. The mapping shows the geology to be artificial ground in this area. It is possible that the underlying gravel deposits were extracted from site and subsequently landfilled. This presents a potential risk of ground gas and vapours to future site users.	H




1.9.2	The data pack also identified two offsite landfills, situated 35m north and 50m southeast of the site. There is no information outlining the composition of the waste. This presents a potential risk of ground gas and vapours to future site users.	
1.10	Additional Information & Previous Reports	
1.10.1	The site is not located in a radon affected area.	
1.10.2	The site is not located in a coal mining affected area.	
1.10.3	The client was offered sight of this report for informative purposes upon their acquisition of the site. However, there is no reliance on the report and the data has not been used for risk assessment purposes.	
1.10.4	<p>We have been provided with the following environmental report for review:</p> <ul style="list-style-type: none"> • Jomas Associates LTD, 2018. Geo-Environmental and Geotechnical Assessment (Ground Investigation) Report for North Hyde Gardens, Hayes, UB3 4QR. Dated: May 2018. Ref: P1470J1364/SL. <p>The client was offered sight of this report for informative purposes upon their acquisition of the site. However, there is no reliance on the report and the data has not been used for risk assessment purposes.</p> <p>Although Paragon cannot be held responsible for the accuracy of the work of others, the following key points and extracts have been noted:</p> <ul style="list-style-type: none"> • A Desk Study (not seen by Paragon) and intrusive investigation were completed. • Ten boreholes were drilled across the British Airways land parcel (around the now demolished building), gas monitoring was undertaken, chemical laboratory testing of soil and water was completed, and a preliminary geotechnical information was obtained. • Chemical analysis identified asbestos fibres in 3 samples, although quantification was <0.001%. • Four gas monitoring visits were completed, and results indicated the site falls within Characteristic Situation 1, whereby no protective measures for gas are required. • Geotechnical testing indicated piling into the London Clay would be suitable. <p>Paragon reviewed the report and determined that:</p> <ul style="list-style-type: none"> • Jomas only accounted for the British Airways plot of land, and therefore, there is a substantial portion of the site to be acquired that has not been tested for contamination. As such, an additional investigation is required on other areas of the site to assess the potential risks of any significant environmental liability associated with acquiring the site, and that may highlight potentially significant development constraints, which may impact future development proposals. 	




	<ul style="list-style-type: none"> In addition, the assessment of the central and western areas identified shallow obstructions and boreholes were terminated at shallow depth due to buried obstructions. Recommendations were made to complete a trial pitting exercise following demolition. Jomas completed a foundation assessment, but did not specify that these obstructions would require removal prior to piling. It is likely that as part of any future development, if piles are adopted as the foundation solution, a probing exercise will be required by the piling contractor to minimise standing time and to refine the design of the pile layout and remove obstructions (where possible). It may be possible to complete a high-resolution Ground Penetrating Radar scan of the BA plot once demolition is complete. However, GPR can suffer from interference and may not be absolutely conclusive so both methods may be required. As a result, an additional investigation is required to obtain data for the areas untested by Jomas. <p>Further details on previous reports are provided in Appendix 6.</p>	
1.11	Regulatory Consultation	
1.11.1	This report is intended to support a planning application for the above described development. Therefore, the Contaminated Land Officer of Hillingdon Borough Council has not been contacted at this juncture. However, as the site is located within an industrial area and the nearest residential property is some 300m from the site (beyond a canal which would break direct contaminant migration pathways to the sensitive receptor), Paragon consider that it would be unlikely that the site is designated as Contaminated Land in its current use in respect of human health.	
1.11.2	The investigation report prepared by Jomas (2018) included a response from the London Fire Brigade following a tank enquiry at the site. The letter (Dated: 23 April 2018, Ref: 26/011675) states that there are no records of petroleum storage tanks on the site and no current license for petroleum storage.	
1.11.3	The Environment Agency has not currently been contacted as part of this assessment. Given the presence of previously contaminative land uses on the site and the river that is also on site, there is a possibility that (depending on the nature and extent of contamination at the property) a Detailed Quantitative Risk Assessment could be required to assess the potential impacts to the underlying Principal Aquifer and river. Piling has been recommended by Jomas and this has the potential to mobilise shallow surface contamination, depending on the technique used. A piling works risk assessment may be required if piles are adopted.	





2.0 ENVIRONMENTAL RISK ASSESMENT

2.1	Preliminary Conceptual Site Model (CSM)
2.1.1	In connection with Part IIA of the EPA 1990 and the regulatory planning framework, a preliminary CSM has been compiled for the site, in Appendix 7. This assessment is based on the potential historical sources identified, the site's environmental setting and the development proposals to evaluate the potential source-pathway-receptor linkages, which must exist to define a site as contaminated land. The evaluation of risk associated with these linkages is set out in Section 3.0.

3.0 ENVIRONMENTAL RISK EVALUATION

	Having evaluated the information gathered during this study and described in the previous sections, Paragon have produced the following evaluation of the overall risk associated with the proposed development.		
3.1	Contamination Potential		
	Issue	Detail	
3.1.1	Significant on site contamination	The potential for residual contamination to be present as a result of the longstanding industrial use of the site cannot be discounted.	
3.1.2	Contaminant migration from site source(s) to off site receptor(s)	The perceived permeability of the underlying Gravel may facilitate the migration of soil and groundwater contamination, if present, off the site.	
3.1.3	Contaminant migration to on site receptor(s) from off site source(s)	The permeability of the underlying Gravel may facilitate the migration of soil and groundwater contamination, if present, onto the site.	

3.2	Environmental Impacts		
	Issue	Detail	
3.2.1	Risk of pollution of Controlled Waters	<p>The Principal Aquifer beneath the site is classified as Controlled Waters and regulated by the EA. Additionally, the nearby surface water features may be in hydraulic continuity with the shallow water table. Therefore, the likelihood of historical onsite contamination potentially impacting the aquifer and river cannot be discounted. Therefore, a ground investigation will be required to establish the impact (if any) of site borne contamination to Controlled Waters.</p>	
3.2.2	Risk of damage to property	<p>There is the potential for ground gas to be generated within Made Ground and ground workings below the site, depending on the nature of the composition of landfilled materials. If a significant biodegradable fraction is present, then this may lead to the production of carbon dioxide and methane, which could migrate into the proposed structure and impact site users. In addition, based on the presence of a flood zone, there is a moderate to high risk of flooding onsite.</p>	
3.2.3	Risk of harm to human health	<p>Given the potential for soil contamination and gas / vapours at the site, there is considered to be potential risks to site users. The extensive covering of hardstanding across the subject site would limit direct dermal contact and ingestion pathways with contaminants (if present). However, it is not clear whether some of the existing structures have gas protection measures so further investigations will be required into the presence of gas and vapour. Construction workers should be equipped with suitable PPE.</p>	

3.3	Business Consequences		
	Issue	Detail	
3.3.1	Risk of liability for the developer	Potential source-pathway-receptor pollutant linkages have been identified including potential for gas /vapour ingress into the building impacting users. Additionally, there are potential impacts to the Principal Aquifer and surface water features.	
3.3.2	Likelihood of designation as Contaminated Land under EPA 1990	Due to the time constraints of the report, it has not been possible to contact the Contaminated Land Officer of Hillingdon Borough Council. However, Paragon consider that it would be unlikely that the site is designated as Contaminated Land in its current use as the site is located within an industrial area and the nearest residential property is some 300m from the site (beyond a canal which would break direct contaminant migration pathways to the sensitive receptor). This report should be submitted in connection with the planning application for the proposed development.	
3.3.3	Suitability for the proposed end use	Further assessment is required to establish the viability of pollutant linkages raised by the CSM and determine appropriate mitigation and / or remediation measures that are likely to be required to facilitate the proposed development.	
3.3.4	Requirement for further investigations	Further investigations are required to determine the risk of environmental liability from historical soil and groundwater contamination. It is anticipated that the ground investigation will comprise of boreholes for groundwater and gas assessment and to allow the collection of soil and groundwater samples for chemical analysis.	

4.0 CONFIRMATION OF INSTRUCTIONS

4.1	We have been instructed by Ark Data Centres Limited C/O Hurley Palmer Flatt to undertake a Phase I Environmental Audit of Former British Airways and Vodafone Plots, North Hyde Gardens, Hayes. The purpose of the report is to highlight environmental considerations with respect to ground conditions as part of the proposed development.
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